Request for Qualifications and Proposal
Construction Manager/General Contractor Services

Prepared for
Town of Frisco

Granite Park Workforce Housing
Frisco, Colorado

August 19 | 2022

HQ | 1550 Wewatta Street, Suite 200, Denver, CO 80202 W | www.dcs-cm.com

TABLE OF CONTENTS

I.0) PURPOSE OF SOLICITATION

2.0) PROJECT DESCRIPTION & OBJECTIVES

3.0) PROJECT BUDGET

4.0) ANTICIPATED PROJECT TIMELINE

5.0) CM/GC SELECTION SCHEDULE

6.0) SUBMITTAL DUE DATE

7.0) MANDATORY PRE-SUBMITTAL MEETING

8.0) REQUESTS FOR CLARIFICATIONS OR INTERPRETATIONS

9.0) MINIMUM REQUIREMENTS

10.0) SUBMITTAL REQUIREMENTS

11.0) PROPOSED SCHEDULE

12.0) FEE PROPOSAL AND GOOD FAITH ESTIMATE

13.0) SELECTION CRITERIA AND EVALUATION

14.0) PERMITS & AUTHORITIES HAVING JURISDICTION (AHJ)

15.0) OWNER FURNISHED INFORMATION

16.0) PROJECT WARRANTIES

17.0) OWNER'S RIGHT, WARRANTIES & DISCLAIMERS

Copyright 2022 | Diversified Consulting Solutions

1.0 PURPOSE OF SOLICITATION

The Town of Frisco ("Owner") invites Qualification Statements and Proposals from interested construction Firms to fill the role of Construction Manager/General Contractor ("CM/GC", "Contractor", "Firm" or "Team"). The Owner is conducting a qualifications based selection process to retain a Firm for the Granite Park Workforce Housing Project (the "Project") located at 619 Granite Street, Frisco CO 80443. The Owner intends to secure the services of a CM/GC Team that will provide comprehensive preconstruction and construction services in order to complete the Project. The Owner reserves the right to award the Project based on best overall value.

The Owner has retained the services of an Owner's Representative, Diversified Consulting Solutions ("Consultant"), to represent its interests throughout this solicitation and for the duration of the Project. The Owner's Representative will manage, on the Owner's behalf, all prime contracts including the CM/GC contract resulting from this solicitation. It is the goal of this solicitation to select a Team that will be compatible with the Owner and the Consultant to provide successful preconstruction and construction services for the Project. The Owner reserves the right to select the Team that it deems to be in its best interest and to reject any and all proposals. The successful Team will enter into a contract with the Owner for construction of the Project and will be responsible for the proper completion of all Services and Work for the Project.

Information concerning the proposed Project and this request can be found in the subsequent Sections.

2.0 PROJECT DESCRIPTION & OBJECTIVES

This Project is a joint project with and funded in part by the State of Colorado, Department of Transportation (CDOT) to create 22 rental units dedicated for local workforce housing, as there is currently a rental housing shortage in Summit County, Colorado. These two structures, 9,715 SF for the east building and 9,945 SF for the west building, will increase the amount of rentable property in Frisco, which in turn should afford all local businesses a better opportunity to house incoming staff. Since this project is a partnership with CDOT, several of the units will be specifically dedicated and reserved for incoming CDOT personnel. This project in particular, will transform half an acre of land in the central core area of downtown Frisco, into a viable and sustainable option for rentable housing.

Attached for referenced and outlined below are the latest construction documents for the project.

Exhibit A – Granite Street Workforce Housing Bid Set, prepared by Studio Architecture, dated March 25, 2022.

Exhibit B - Granite Park Village Project Manaual Bid Set, prepared by Studio Architecture, dated March 25, 2022.

3.0 PROJECT BUDGET

The Owner has established anticipated costs for the Project based on a 3rd party cost estimate (estimate derived from 80% CD level document set dated December 2021).

The expected hard cost, construction budget for the Project is **approximately $10,000,000.**

The budget is provided for informational purposes only and is subject to change at a future date without penalty to the Owner.

Copyright 2022 | Diversified Consulting Solutions

4.0 ANTICIPATED PROJECT TIMELINE

The Owner and selected Team will develop a detailed Construction Schedule during the planning phase of the project. *It is the Owner's goal to commence construction as soon as practical in Spring 2023.*

The following project timeline is subject to change at Owner's sole discretion.

Preconstruction Services Start	November 2022
Construction Documents Estimate	November - December 2022
Execute GMP Amendment	January 10, 2023
Permitting	September - December 2022
Construction Start	Spring 2023 -To be established w/ GMP
Construction Completion/Occupancy	TBD

5.0 CM/GC SELECTION SCHEDULE

The following is the anticipated schedule for the CMGC Team selection process for this effort:

RFQ Notification Date	**August 19, 2022**
Mandatory Virtual Pre-Submittal Meeting	**September 7, 2022 @ 9:00am**
Request for Clarifications	**September 9, 2022 by 3pm**
Response to Clarifications	**September 14, 2022**
RFQ Submittal Deadline	**September 23, 2022 by 3pm**
Short List Notification	**September 29, 2022**
Interviews (as needed)	**October 6, 2022, 8am – 12pm**
Finalize Agreements	**October 17, 2022**
Town Council Action to Ratify Selection	**October 25, 2022**

6.0 SUBMITTAL DUE DATE

Provide one complete (1) "Electronic" submittal, including a Fee Proposal and Good Faith Estimate, submitted via BidNet Direct. Submittals will be received until **3:00 pm, Friday, September 23, 2022.**

The electronic document shall be in PDF format with section bookmarks to match the submittal requirements outlined in this document. Submittals that are not bookmarked may be considered non-responsive.

Submittals received after the date and time stipulated above will be considered non-responsive and will not be reviewed.

RFQ submittals will be reviewed and the reviewing committee will identify a short list of submitting Teams. Short listed Firms will be notified and may be requested to schedule a time for a presentation and interview with the reviewing committee. Dates and times of interviews are subject to change but are anticipated to occur, as needed, on **Thursday, October 6, 2022.**

Copyright 2022 | Diversified Consulting Solutions

7.0 MANDATORY VIRTUAL PRE-SUBMITTAL MEETING

A. A Mandatory Pre-Submittal Meeting will be held virtually via Microsoft Teams on the date and time listed below:

Tuesday, September 7, 2022 at 9:00am MDT.

Microsoft Teams Meeting
Join on your computer or mobile app
Click here to join the meeting
Meeting ID: 219 662 352 785
Passcode: GeMArN
Download Teams | Join on the web

Or call in (audio only)
+1 720-617-3926,,416577050# United States, Denver
Phone Conference ID: 416 577 050#

B. The purpose of the Pre-Submittal Meeting is to provide Teams with detailed information concerning this solicitation and to address questions and concerns raised by interested Firms. Owner's staff and the Consultant will be present to address technical questions and inquiries related to the RFQ/P submittal requirements.

C. Teams are required to attend and sign in to meet the minimum requirements of the Request for Qualifications and Proposal AND remain qualified to submit. Submittals will not be accepted from Teams that do not attend the mandatory Pre-Submittal Meeting.

D. Firms are prohibited from contacting representatives of The Town of Frisco directly. Additional meetings or site visits, in lieu or participation in this meeting, will not be made available. Any Firms not in attendance acknowledge and waive their right to any claims for information missed by not attending.

8.0 REQUESTS FOR CLARIFICATIONS OR INTERPRETATIONS

All questions concerning this solicitation must be addressed to the Owner's Representative and submitted via BidNet Direct. P*lease refrain from contacting the Owner or representatives of The Town of Frisco directly.*

All telephone conversations are considered to be unofficial responses and will not be binding. Questions or requests for clarifications to the solicitation shall be submitted in writing via BidNet Direct, and if appropriate, will be responded to in writing and distributed via BidNet to all respondents. Written addenda will be the Owner's official method of response. To be considered for response, requests for clarification must be received no later than **3:00pm, Friday, September 9, 2022.**

9.0 MINIMUM REQUIREMENTS

The Team and all members of the CM/GC Team must submit proof of possessing the minimum qualifications described below. Such proof is to be included in Section A of the submittal. Failure to meet such Minimum Requirements, including attendance at the mandatory Pre-Submittal

Meeting, may result in rejection or disqualification from the process. In that event, information contained in the other sections of the submittal will not be reviewed or evaluated.

Required Licenses, Registrations and Regulations:
The Team submitting a response to the RFQ must possess and provide evidence that it is a properly formed and currently registered entity in "Good Standing" with the office of the Colorado Secretary of State (Provide current Certificate of Fact of Good Standing - https://www.sos.state.co.us/). The Team is required to become aware of and comply with applicable Federal, State and Local regulations as necessary to perform Services and Work under the proposed CM/GC contract.

Minimum Insurance Requirements:
The Team must provide evidence of its ability to obtain and provide Comprehensive Commercial General Liability, Comprehensive Automobile Liability, Workers Compensation and Employer's Liability, Excess (Umbrella) Liability, Professional Liability, and Builder's Risk insurance from an insurer licensed to do business in the State of Colorado having a minimum AM Best Financial Strength Rating (FSR) of "A-", and a Financial Size Category (FSC) of "X". Contractor shall provide coverage with limits of liability not less than those stated below. An umbrella and/or excess liability policy may be used to meet the minimum liability requirements provided that the coverage is written on a "following form" basis.

1. Commercial General Liability:

    a. Minimum Limits:
    $2,000,000 General Aggregate
    $2,000,000 Products/Completed Operations Aggregate
    $1,000,000 Each Occurrence
    $1,000,000 Personal/Advertising Injury
    $50,000 Fire Damage (Any One Fire)
    $5,000 Medical Payments (Any One Person)

2. Automobile Liability

    a. Bodily injury and property damage for any owned, hired, and non-owned vehicles used in the performance of this contract.

    b. Minimum Limits:
    Bodily Injury/Property Damage (Each Accident): $1,000,000

3. Workers' Compensation and Employers' Liability

    a. Policy shall contain a waiver of subrogation in favor of the Owner.

    b. This requirement shall not apply when a Contractor or subcontractor is exempt under Colorado Workers' Compensation Act, and when such Contractor or subcontractor executes the appropriate sole proprietor waiver form.

    c. Minimum Limits:
    Coverage A (Workers' Compensation): Statutory
    Coverage B (Employers Liability): $500,000 (Each Accident)
    $500,000 (Disease Each Employee)
    $500,000 (Disease Policy Limit)

4. Professional Liability

    a. The Contractor shall maintain Professional Liability covering wrongful acts, errors and/or omissions, including design errors, if applicable, for damages sustained by reason of or in the course of operations under this contract resulting from professional services provided by the Contractor as part of the contract.

    b. Coverage shall apply for three (3) years after Project is completed.

    c. Policy is to be on a primary basis, if other professional coverage is carried.

    d. Minimum Limits:

Per Loss:	$1,000,000
Aggregate:	$1,000,000

5. Builder's Risk Insurance/Installation Floater – Completed Value Basis

    a. The Contractor shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, Builders' Risk Insurance in the amount of the initial contract sum, plus value of subsequent modifications, change orders, and cost of material supplied or installed by others, comprising total value of the entire Project at the site on a replacement cost basis without optional deductibles.

    b. The Builders' Risk insurance shall include interests of the Owner and if applicable, affiliated or associate entities, the General Contractor, subcontractors and sub-tier contractors in the Project.

6. Pollution Insurance

    a. Pollution liability insurance covering Contractor's liability for bodily injury, property damage and environmental damage resulting from sudden accidental and gradual pollution related cleanup costs incurred by Contractor, arising out of the Services (including transportation risk) performed under the Agreement.

    b. Minimum Limits:

Each Occurrence:	$1,000,000
General Aggregate:	$1,000,000

    c. Such policy shall have a maximum deductible of $25,000 to be paid by the Contractor

Insurance Requirements shall include the following:

    a. On insurance policies where the Owner is named as an additional insured, the Owner shall be an additional insured to the full limits of liability purchased by the Contractor even if those limits of liability are in excess of those required by the contract.
    b. The Contractor's insurance coverage shall be primary insurance and non-contributory with respect to all other available sources.

The CM/GC shall not be relieved of any liability, claims, demands or other obligations assumed pursuant to any contract entered into by the Owner by reason of its failure to procure or maintain

such insurance, or by reason of its failure to procure or maintain insurance in sufficient amounts, durations or types.

Certificates of Insurance shall provide that the insuring company will not cancel the policy without first providing the Owner with at least thirty (30) days written notice. The CM/GC's insurance company shall provide a letter stating that coverage as required is in force.

Minimum bonding capacity:
The Firm must provide evidence of its ability to obtain a project-specific Performance and Payment Bond, in the form provided by the Owner, in an amount equal to 110% of the estimated contract amount. Evidence of bonding capacity shall be in the form of a letter from the firm's authorized surety. The selected Firm will be required to maintain bonds in effect through the period of the contract for 100% of the total contract amount plus changes in the contract value that result in a net increase in the contract amount. The surety company must be authorized to do business in the State of Colorado and demonstrate a minimum AM Best Financial Strength Rating (FSR) of "A-", and a Financial Size Category (FSC) of "X". **Owner required Payment and Performance Bond forms are attached as Exhibits F and G respectively.**

Form of Agreement:
Selected Firm(s) will be expected to execute AIA Document A133-2019 Standard Form of Agreement Between Owner and Construction Manager as Constructor, *where the basis of payment is the Cost of Work Plus a Fee with a Guaranteed Maximum Price, Exhibit B – Insurance and Bonds* and associated General Conditions AIA Document A201-2017, as modified by Owner's legal counsel and attached for reference as **Exhibits C, D and E respectively**. *The Granite Park Workforce Housing Project is funded in part by the State of Colorado, Department of Transportation (CDOT). As such, the State of Colorado will have some influence within the context of the CM/GC Agreement.*

The Owner's selection of a Contractor is expressly conditioned on the Owner and the Contractor entering into the form of agreement referenced above. Among other terms and conditions, the CM/GC contract will contain a delay damages clause in an amount of **$1,450 per day** for every day completion of the Project extends beyond the Project completion date established by the Owner and the Contractor, except for reasons of force majeure. The CM/GC will work with Owner to establish milestone completion dates and the delayed damages clause will apply to those agreed upon dates. If for any reason the parties have not fully executed a mutually acceptable CM/GC Contract within 20 days of the Owner conditionally selecting the Contractor, the Owner may, at its option, commence contract negotiations with one or more of the other Contractors who submitted Qualification Statements and Fee Proposals in response to this RFQ, without the necessity of issuing a new Request for Qualifications and Fee Proposal for this Project. The Owner also has the right to terminate the process, modify the process and/or commence a new process for selecting a CM/GC.

Owner's Representative Project Management Application:
The selected Team will be required to work within the Consultant's project management application to submit schedule of values, applications for payment and change orders. There is no cost for CM/GC's participation in or use of the application.

10.0 SUBMITTAL REQUIREMENTS

Throughout the submittal, the Team's emphasis should be placed on the proposed Team members and Firm's relevant experience in construction of facilities of similar size and complexity to the Projects described in Section 2.0.

There is no page limit for the Team's Statement of Qualifications however, concise responses addressing the specific requirements of this Request for Qualifications will aid in the evaluation process.

The Qualifications Statement shall include the following information, numbered, and tabbed, in the order indicated below:

Cover Letter
A maximum two-page letter of interest that includes a synopsis of the Contractor's Firm, distinguishing firm characteristics, primary contact information and commitment of the proposed project Team members to this Project for the scheduled duration. This letter must be signed by an officer of the company.

A. Minimum Requirements
Submit proof of possession of the Minimum Requirements, as per Section 9.0 of this RFQ including the additional items outlined in d - g below:

a. Provide evidence that the Firm is a properly formed and registered entity in "Good Standing" with the office of the Colorado Secretary of State.
b. Provide evidence of Firm's ability to obtain and provide the minimum insurance requirements.
c. Provide a statement of the maximum dollar value for which your Firm can be bonded and the amount your Firm currently has bonded (attach a letter of confirmation from your bonding company).
d. Company Name, Location and Legal Status:
    i. Identify the full legal name of your organization and how many years your organization has been in business.
    ii. List all prior names under which your organization has operated and, for each name, indicate the date range and jurisdiction in which it was used.
    iii. Identify the legal status under which your organization does business (sole proprietorship, partnership, corporation, limited liability corporation, joint venture, or other) and provide the names and titles of the corporate officers, partners or owners as applicable.
e. Financials:
    i. Attach financial statements for the last three years prepared in accordance with Generally Accepted Accounting Principles, including your organization's latest balance sheet and income statement. Also, indicate the name and contact information of the firm that prepared each financial statement.
    ii. Has your organization, its parent, or a subsidiary, affiliate, or other entity having common ownership or management, been the subject of any bankruptcy proceeding within the last ten years?
f. Disputes and Disciplinary Actions:
    i. Are there any pending or outstanding judgments, arbitration proceedings, bond claims, or lawsuits against your organization, its parent, or a subsidiary, affiliate, or other entity having common ownership or management, or any of the individuals listed in Item d above? If yes, provide explanation.
    ii. In the last five years has your organization, its parent, or a subsidiary, affiliate, or other entity having common ownership or management:
        a. Failed to complete work awarded to it?
        b. Been terminated for any reason except for an owner's convenience?
        c. Had any judgments, settlements, or awards pertaining to a construction project in which your organization was responsible?
        d. Filed any lawsuits or requested arbitration regarding a construction project?
    iii. In the last five years, has your organization, its parent, or a subsidiary, affiliate, or other entity having common ownership or management; or any of the individuals listed in Item d above:

a. Been convicted of, or indicted for, a business-related crime?
b. Had any business or professional license subjected to disciplinary action?
c. Been penalized or fined by a state or federal environmental agency?

g. Provide your Experience Modification Rate (EMR) for the past three years. If your EMR is not known, please provide a summary of job-related incidents within the last 5 years.

B. Firm Organization

Provide a clear and descriptive organizational outline or chart, identifying key Team members proposed for the Project, including the Superintendent, Project Manager and Preconstruction Manager. All major participants of the Team shall be identified along with their project roles, responsibilities and their reporting accountability. Lines of authority and communication shall be clearly shown. It is anticipated that the CM/GC Firm will assign one Project Manager.

C. Qualifications of Key Personnel

Provide a one-page resume for each individual listed on the organizational chart (Section B). List the individual's position, project responsibility, education, license or registration (where applicable), affiliations, publications, awards, and relevant experience over the last five years. Identify other projects and proposals, and timing of same that these Team members are committed to at this time. Applicants are reminded that after pre-qualification, significant changes in the composition of the CM/GC Team's personnel, roles or responsibilities may not be made without the consent of the Owner.

D. CM/GC Delivery Method Experience

The CM/GC delivery method has been chosen because a high-performing, collaborative Team is important to the success of this Project. Describe your firm's experience with this delivery method and provide examples of how your Team has added value to the projects successfully completed through this type of project delivery method. The response should address the following capabilities: client relations, pre-construction services, construction management, cost control, quality control, schedule control, and risk management.

E. Contractor's Construction Experience

Provide at least 3 examples of projects (completed within the last five years) of similar construction experience, including facility type, contract value, schedule and any attributes that may be relevant to this Project. Identify which proposed Team members participated on these examples. Clearly indicate why these projects are relevant.

Provide owner references for each project cited. The cited reference must contain correct name and telephone number of the appropriate reference and the applicant should verify the availability of the reference prior to submittal.

F. Project Approach

- Describe your Firm's approach to providing CM/GC preconstruction and construction services specific to this Project. Describe your Firm's methodology and approach for incorporating changes during the design and construction phases.

- Describe your approach to safety and logistics, including traffic control as it relates to the site constraints of the Granite Park project in downtown Frisco.

G. Subcontractor Procurement

Provide a written description of the proposed sub-contractor solicitation and procurement process for this Project. Explain how you propose to develop interest and maintain participation of qualified subcontractors through the bidding process in the current market. Describe how the Team would propose to include "local" vendors, suppliers and subcontractors in the bid process.

Indicate and itemize all construction, management and supervision that the Team would propose to self-perform versus performance through subcontractors. Specify what types of Work will not be competitively bid and your rationale for this approach.

H. Statement of Differentiation

Explain in one page or less what differentiates your Team from other qualified competing Firms, specifically in regard to this Project.

I. Proposed Schedule

As part of the Submittal Requirement, responding Firms must also provide a proposed/estimated schedule for the Project as outlined in Section 11.0 below.

J. Fee Proposal and Good Faith Estimates

As part of the Submittal Requirements, responding Firms must also provide a Fee Proposal and Good Faith Estimate for the Project as outlined in Section 12.0 below.

11.0 PROPOSED SCHEDULE

Provide a proposed/estimated schedule for the Project. While there is some flexibility in schedule, Teams should make it clear that thought has been put into shift work, phasing, project start and end dates, as well as critical milestones that need to be met.

The Contractor's Schedule shall be a Critical Path Method (CPM) schedule prepared to show data for the entire construction project. The Contractor's Schedule shall contain each of the following elements:

1. Clearly indicate Early Start, Late Start, Early Finish, Late Finish and Total duration for each task.
2. Clearly identify those tasks that are on the Critical Path.
3. Indicate Project Start, Substantial Completion & Final Acceptance dates as Milestones.
4. Indicate sufficient other Milestones to easily track overall Contractor's adherence to schedule.
5. Indicate dates for Contract Closeout Procedures, Product Demonstrations/Trainings, Owner's move-in and Occupancy.
6. Use the dates provided in Section 4.0 Anticipate Project Timeline above as a benchmark for assumptions and calculations of allowable workdays and hours, as they relate to general conditions.

12.0 FEE PROPOSAL AND GOOD FAITH ESTIMATE

In addition to the qualifications above, each responding firm must also provide a Fee Proposal and Good Faith Estimate for the Project based on the Construction Documents identified in Section 2 and attached as exhibits. One (1) complete, electronic copy of the Fee Proposal and Estimate shall be included as a separate section within the electronic submittal required per Section 6.0 above. ***The Owner reserves the right to award the project based on best overall value.***

The CM/GC's Fee Proposal is to be presented as provided in Exhibit H.

The Good Faith Estimate should be provided and organized per CSI division.

13.0 SELECTION CRITERIA AND EVALUATION

CM/GC Teams responding to this Request for Qualifications will be evaluated based on the criteria noted below:

A. The Firm's understanding of the Project and the needs of the Owner and general Project approach.

B. The Firm's experience, qualifications and capability. This includes experience with the CM/GC delivery method, management and procurement experience related to subcontractors, cost, schedule and quality control, and risk management.

C. The relevant experience of principal Team members and diversity of expertise.

D. The Firm's references for work performed on similar projects.

E. The clarity, responsiveness and professionalism of the submittal.

F. Whether the company is firmly established in the business, financially responsible, and has the resources and ability to offer its services in a professional, expedient manner.

G. The Firm's understanding of the requirements of Town of Frisco, Summit County and the State of Colorado including the permitting and approval process.

H. Proposed schedule for completion of the Work.

I. The estimated costs for completion of the Work.

Shortlisted Firms may be invited to participate in interviews. Interviews will be scored separately from the RFQ submittals, interview process and scoring format will be provided to shortlisted Firms. Fees will be reviewed and considered as part of the final analysis in an effort to establish overall best value.

The Owner may request additional information as deemed necessary. Failure to provide such information may result in the submittal being considered non-responsive. Modifications may be made to the scoring based on the experiences the selection committee has had with the Firm, or if they envision conflicts of interests. The Owner reserves the right to reject any and all submittals, waive informalities and to reject non-conforming, non-responsive or conditional submittals.

14.0 PERMITS & AUTHORITIES HAVING JURISDICITON (AHJ)

The Architect will apply to the Summit County Building Department, for the plan review and Building Permit, and distribute the permit to the Owner and General Contractor. The Owner shall pay for the plan review and Building Permit, and the inspections normally provided by the Town of Frisco. The following fees shall be paid for by the Owner if applicable to the Work:

1. Water plant investment fee and water tap fee.
2. Sewer plant investment fee, sewer reimbursement charge, and sewer tap fee.
3. Bringing permanent electrical service to the transformer including transformer pad.
4. Street over-sizing fee.
5. Storm drainage fee.
6. Gas tap fees.

The Contractor shall pay for all other required inspections, permits, licenses, and fees, including but not limited to State Electrical Board and State Plumbing Board Permits. The Contractor shall be responsible to make calls and arrange for all inspections required by all applicable Authorities Having Jurisdiction over the Project.

Assessments against the property are the obligation of the Owner and will be paid by the Owner as necessary to assure issuance of permits specified above. This includes sewer and water charges for capital improvements and line extensions, including plant investment fees and connection charges based on the cost of mains serving the site.

15.0 OWNER FURNISHED INFORMATION

The following Owner-furnished data will be made available to the selected Team in order to support the pre-construction process:

- ☒ Geotechnical Report & Recommendations,
- ☒ Site Survey including boundary, topography and existing features,
- ☒ Phase I Environmental Site Assessment
- ☐ Asbestos hazard and regulated building materials survey
- ☐ As-built or record documents

The Owner is providing the above items noted but in no way does it remove responsibility of the Contractor to preform due diligence. No allowance or extra consideration shall be paid by the Owner as a result of the Contractor's lack of familiarity with the site and location of the Work.

Before submitting a Fee Proposal, the Contractor shall personally inspect the site of the proposed Work. Submission of a Fee Proposal shall constitute conclusive evidence that the Contractor has personally inspected the site of the Project. No allowance or extra consideration to the Contractor will be paid by the Owner by reason of additional costs, damages, or other difficulties incurred by the successful Contractor that could have been avoided had an adequate inspection of the site been undertaken.

16.0 PROJECT WARRANTIES

In addition to all subcontractor, manufacturer or vendor warranties, the Contractor shall provide a two-year warranty on all Work performed on the Project. The Contractor shall also serve as the Warranty Administrator for the Project. The Warranty Administrator shall be responsible for all aspects of the timely and effective administration of all warranties, including but not limited to: a) defining a warranty process for claims; b) providing a warranty claim form for the Owner's use; c) receiving all warranty claims from the Owner; d) identifying and contacting the individuals(s) or entity(ies) issuing the warranty under which the claim is being made; e) arranging for all warranty Work; f) administering all documents necessary and appropriate for the proper and timely processing of each warranty claim; g) completing review on a periodic basis of a status log of all warranty claims; and h) initiation and completion of 11 and 23 month warranty walks. This obligation shall be expressly stated in the contract between the successful Contractor and the Owner.

Copyright 2022 | Diversified Consulting Solutions

17.0 OWNER'S RIGHT, WARRANTIES & DISCLAIMERS

1. The selection of the CM/GC Team will not be based solely on cost, but rather the best interest of the Owner. Owner's selection committee will make a recommendation to the Town Council based upon all elements of evaluation and information provided in the submittal, interviews and subsequent contract negotiations.
2. The respondents to the Request for Qualifications warrant that they are able to complete the project to specifications that will meet or exceed the minimum code and safety requirements as set by the State of Colorado, Summit County, Summit Fire and EMS and Town of Frisco where applicable, as well as, all other Authorities Having Jurisdiction over the projects. Additionally, they also warrant that they will complete the Project to the minimum standards and requirements of all municipal, county, state and federal agencies having jurisdiction and authority over the projects.
3. The Respondents warrant that they will comply with Colorado Immigration Law. Specifically, the Contractor shall comply with all provisions of Colorado Immigration Law in effect prior to or during the performance of Work under the Project including but not limited to Colorado Revised Statute Title 8, Article 17.5 Illegal Aliens - Public Contracts for Services (CRS 8-17.5-101 & 102) & Title 8, Article 2 Employment Verification Requirements (CRS 8-2-122). Contractor further represents, warrants and agrees to comply with the requirements of Colorado Immigration Law as therein set forth and to insert, or include by reference, this clause, and require compliance therewith, in all subcontracts hereunder.
4. The Owner reserves the right to accept/reject any or all submittals received through this solicitation process. The Owner reserves the right to terminate or modify the CM/GC selection process, including the Selection Schedule, at any time as may be deemed necessary and in the best interests of Town of Frisco.
5. The Owner reserves the right to award the Project(s) in the manner deemed most beneficial to Town of Frisco and that provides the greatest overall value.
6. Selected Firms will be expected to execute AIA Document A133-2019 Standard Form of Agreement Between Owner and Construction Manager as Constructor, *where the basis of payment is the Cost of Work Plus a Fee with a Guaranteed Maximum Price, Exhibit B – Insurance and Bonds* and associated General Conditions AIA Document A201-2017, as modified by Owner's legal counsel and attached for reference as Exhibits C, D and E respectively. *The Granite Park Workforce Housing Project is funded in part by the State of Colorado, Department of Transportation (CDOT). As such, the State of Colorado will have some influence within the context of the CM/GC Agreement.*
7. All costs incurred by prospective CM/GC Teams associated with the preparation of submittals, attendance at interviews and contract negotiations in response to this Request for Qualifications are the sole responsibility of the Applicant.
8. The Qualification Statement and Fee Proposal (if applicable), and all supporting documentation, attachments, supplementary materials, sketches, etc. shall become the property of The Town of Frisco and will not be returned to the Contractor.
9. Owner's obligations under this Agreement are contingent upon its securing adequate financing, upon terms acceptable to the Owner, in Owner's sole discretion, within a reasonable period of time, which shall be commensurate with the progress of Services and Work contemplated by the Agreement. Nothing contained herein shall obligate the Owner to make any specific efforts or to make any particular inquiries or applications with respect to financing. In the event the Owner fails to obtain adequate financing, Owner may notify CM/GC Team and terminate the Agreement.
10. This section is intended for informational purposes only and no response is expected nor encouraged. However, questions, comments, or concerns with regard to the contract terms and conditions must be included with your submittal. Absent any such attachment, the Owner

will assume Firm's full acceptance of the contract terms and conditions. Exceptions requested, or alternative language suggested, will be treated as a "counter-offer." The willingness and/or ability of the Owner to accept or negotiate such suggested changes will be considered on a case--by--case basis. Please note, if your Firm does offer suggested modifications, the decision to reject, accept, or further negotiate requested changes will be at the Owner's discretion. IF YOUR COMPANY NORMALLY SEEKS LEGAL REVIEW OF CONTRACT TERMS, THIS PROCESS SHOULD OCCUR PRIOR TO SUBMISSION OF YOUR SUBMITTAL AND YOUR SUBMITTAL MUST IDENTIFY ANY TERM OR CONDITION YOU ARE QUESTIONING AND HOW YOU WOULD SUGGEST IT BE RESOLVED.

END OF REQUEST FOR QUALIFICATIONS
CM/GC SERVICES
GRANITE PARK WORKFORCE HOUSING

Diversified Consulting Solutions
1550 Wewatta Street, Suite 200
Denver, CO 80202

ADDENDUM NO. 01

Request for Qualifications and Proposal - CM/GC Services
Town of Frisco - Granite Park Workforce Housing

To:	All Current Plan Holders via BidNet Direct
From:	Diversified Consulting Solutions, On behalf of Town of Frisco
Date:	September 14, 2022
Distribution:	Registered Firms via BidNet Direct; File; Town of Frisco

A1.1 – Mandatory Pre-Submittal Conference Attendees:
The list of attendees that participated in the virtual mandatory pre-submittal conference on September 7, 2022 and whom remain eligible to submit RFQ/P Responses are listed on the attached CM/GC Mandatory Pre-Submittal sign-in sheet, dated September 7, 2022.

A1.2 – Q&A:
No Requests for Clarifications were received.

A1.3 – DOLA Grant Award:
The Town of Frisco has been awarded a DOLA Grant from the State of Colorado Department of Local Affairs (DOLA) for a portion of the project funding. The selected CM/GC firm will be required to comply with any contractor/subcontractor requirements within the grant. The selected firm will work with the Owner to determine all applicable requirements.

This Addendum supersedes the solicitation documents by adding to, deleting from and/or modifying the Request for Qualifications/Proposal as set forth herein. To the extent any such addition, deletion or modification result in any conflict or inconsistency between the solicitation documents and this Addendum, this Addendum shall take precedence.

(END OF ADDENDUM NO. 1)

Client: Town of Frisco/CDOT
Project Title: Granite Park Workforce Housing
Meeting: CM/GC Mandatory Pre-Submittal Meeting (vitual)
Date & Time: September 7, 2022 @ 9:00am

Meeting Sign-In Sheet

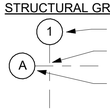
	Firm Name	Contact Person	Contact Phone #	Email Address
1	Taylor Kohrs	Brian Cohen	303-598-3063	brianc@taylorkohrs.com
2	MW Golden Constructors	Garrett Tormoen	303-829-0031	marketing@mwgolden.com
3				
4				
5				
6				
7				
8				
9				
10				

ABBREVIATIONS

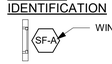
&	AND
(C)	CAULKING
(E)	EXISTING
(N)	NEW
(R)	REMOVE
(S)	SEALANT
(T)	TEMPERED
∠	ANGLE
@	AT
A/V	AUDIO/VISUAL
AB	ANCHOR BOLT
ABV	ABOVE
ACC	ACCESSIBLE
ACOUS	ACCOUSTICAL
ACT	ACCOUSTICAL CEILING TILE
AD	AREA DRAIN or ACCESS DOOR
ADD	ADDENDUM
ADJ	ADJACENT or ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
AGG	AGGREGATE
AHU	AIR HANDLING UNIT
ALT	ALTERNATE
ALUM	ALUMINUM
ANOD	ANODIZED
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
ASI	ARCHITECT'S SUPPLEMENTAL INSTRUCTIONS
ASPH	ASPHALT
ASSY	ASSEMBLY
AUTO	AUTOMATIC
AVE	AVENUE
AVG	AVERAGE
AWP	ACOUSTICAL WALL PANEL
B	BASE
BD	BOARD
BIT	BITUMINOUS
BLDG	BUILDING
BLKG	BLOCKING
BM	BEAM or BENCH MARK
BO	BOTTOM OF
BOT	BOTTOM
BR	BEDROOM
BR	BACKER ROD
BRG	BEARING
BRK	BRAKE METAL
MTL	
BSMT	BASEMENT
C	CENTER
CAB	CABINET
CATV	CABLE TELEVISION
CCD	CONSTRUCTION CHANGE DIRECTIVE
CCTV	CLOSED CIRCUIT TELEVISION
CDOT	COLORADO DEPARTMENT OF TRANSPORTATION
CEM	CEMENTITIOUS
CFL	COMPACT FLUORESCENT or COUNTERFLASHING
CG	CORNER GUARD
CIP	CAST IN PLACE
CIRC	CIRCUMFERENCE
CJ	CONTROL JOINT
CL	CENTERLINE
CLG	CEILING
CLOS	CLOSET
CLR	CLEAR
CM	CENTIMETERS
CMU	CONCRETE MASONRY UNIT
CNTR	COUNTER
CO	CENTER OF or CHANGE ORDER or CLEANOUT
COL	COLUMN
CONC	CONCRETE
CONF	CONFERENCE
CONN	CONNECTION
CONSTR	CONSTRUCTION
CONT	CONTINUOUS
CONTR	CONTRACTOR
CORR	CORRIDOR or CORRUGATED
CPT	CARPET
CT	CERAMIC TILE OR COUNTER TOP
CU	CUBIC
CY	CUBIC YARD
DAMP	DAMPROOFING
DBL	DOUBLE
DEG	DEGREE
DEMO	DEMOLISH or DEMOLITION
DEPT	DEPARTMENT
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DISP	DISPENSER
DIV	DIVISION
DN	DOWN
DR	DOOR
DRN	DRAIN(AGE)
DS	DOWNSPOUT
DTL	DETAIL
DWG	DRAWING
DWR	DRAWER
E	EAST
EA	EACH
EF	EXHAUST FAN
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRICAL
ELEV	ELEVATOR
EMER	EMERGENCY
ENGR	ENGINEER
EOS	EDGE OF SLAB
EQ	EQUAL
EQUIP	EQUIPMENT
ES	EACH SIDE
EST	ESTIMATE
EW	EACH WAY
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
EXT	EXTERIOR
F	FARENHEIT
FA	FIRE ALARM
FAC	FIRE ALARM CABINET
FACP	FIRE ALARM CONTROL PANEL
FD	FLOOR DRAIN or FIRE DAMPER
FDN	FOUNDATION
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FF	FINISHED FLOOR
FF&E	FURNITURE FIXTURES AND EQUIPMENT
FFE	FINISH FLOOR ELEVATION
FH	FIRE HYDRANT
FHC	FIRE HOSE CABINET
FHV	FIRE HOSE VALVE
FIN	FINISH(ED)
FIXT	FIXTURE
FLG	FLASHING
FLR	FLOOR(ING)
FLUOR	FLUORESCENT
FOC	FACE OF CONCRETE
FOF	FACE OF FINISH
FOM	FACE OF MASONRY
FOS	FACE OF STUD
FR	FIRE RESISTIVE or FIRE RATED
FRP	FIBERGLASS REINFORCED PANEL(ING)
FRT	FIRE RETARDANT TREATED
FSD	FIRE SEPARATION DISTANCE
FT	FOOT (FEET)
FTG	FOOTING
FURN	FURNISH(ED)
FURR	FURRED or FURRING
FUT	FUTURE
FVC	FIRE VALVE CABINET
GA	GAUGE
GALV	GALVANIZED
GB	GRAB BAR
GC	GENERAL CONTRACTOR
GI	GALVANIZED IRON
GL	GLASS or GLAZING
GND	GROUND
GR	GRADE
GRT	GROUT
GSF	GROSS SQUARE FEET
GSM	GALVANIZED SHEET METAL
GT	GLASS TILE
GWB	GYPSUM WALLBOARD
GYP	GYPSUM
GYP BD	GYPSUM BOARD
HAS	HEADED ANCHOR STUD
HB	HOSE BIB
HC	HOLLOW CORE or HANDICAPPED
HDR	HEADER
HDWR	HARDWARE
HFA	HOT FLUID APPLIED
HM	HOLLOW METAL
HORIZ	HORIZONTAL
HR	HOUR
HT	HEIGHT
HTR	HEATER
HVAC	HEATING, VENTILATION and AIR CONDITIONING
HW	HOT WATER
HWH	HOT WATER HEATER
HWY	HIGHWAY
IBC	INTERNATIONAL BUILDING CODE
ID	INSIDE DIAMETER
IN	INCHE(S)
INCAND	INCANDESCENT
INCL	INCLUD(ED)
INFO	INFORMATION
INSUL	INSULATION or INSULATED
INT	INTERIOR
INTMED	INTERMEDIATE
INV	INVERT
JC	JANITOR CLOSET
JST	JOIST
JT	JOINT
KD	KNOCKDOWN or KILN DRIED
KIT	KITCHEN
KO	KNOCKOUT
KP	KICK PLATE
LAB	LABORATORY
LAM	LAMINATE(D)
LAV	LAVATORY
LB	POUND(S)
LBL	LABEL
LDR	LEADER
LH	LEFT HAND
LKR	LOCKER
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LT	LIGHT
LTL	LINTEL
LVL	LAMINATED VENEER LUMBER
LVR	LOUVER
MACH	MACHINERY
MAG	MAGNETIC
MAS	MASONRY
MATL	MATERIAL
MAX	MAXIMUM
MB	MOISTURE BARRIER
MBA	MASTER BATHROOM
MBR	MASTER BEDROOM
MECH	MECHANICAL
MED	MEDIUMer MEDICAL
MEMB	MEMBRANE
MEP	MECHANICAL, ELECTRICAL and PLUMBING
MEZZ	MEZZANINE
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MIRR	MIRROR
MISC	MISCELLANEOUS
MM	MILLIMETERS
MO	MASONRY OPENING
MTD	MOUNT(ED)
MTL	METAL
MUL	MULLION
N	NORTH
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
NRC	NOISE REDUCTION COEFFICIENT
NTS	NOT TO SCALE
OA	OVERALL
OC	ON CENTER
OD	OUTSIDE DIAMETER
OF	OUTSIDE FACE
OFF	OFFICE
OH	OPPOSITE HAND or OVERHEAD
OPNG	OPENING
OPP	OPPOSITE
OTO	OUTSIDE-TO-OUTSIDE
P	PAINT(ED)
P/L	PROPERTY LINE
PAR	PARALLEL
PART	PARTITION
PC	PRECAST
PERF	PERFORATED
PERIM	PERIMETER
PKG	PARKING or PACKAGE
PL	PLATE
PLAM	PLASTIC LAMINATE
PLAS	PLASTER
PLBG	PLUMBING
PLYWD	PLYWOOD
PNL	PANEL
POL	POLISHED
PR	PAIR or PROPOSAL REQUEST
PREFAB	PREFABRICATED
PREFIN	PREFINISHED
PRESTR	PRESTRESSED
PRIM	PRIMARY
PROJ	PROJECT
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	POST TENSIONED or PORCELAIN TILE
PT	PRESSURE TREATED
PTD	PAPER TOWEL DISPENSER
PTDR	PAPER TOWEL DISPENSER AND RECEPTACLE
PTN	PARTITION
PTR	PAPER TOWEL RECEPTACLE
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
QT	QUARRY TILE
QTY	QUANTITY
R	RISER
RAD	RADIUS
RB	RUBBER BASE
RBC	RUBBER BASE COVE
RBS	RUBBER BASE STRAIGHT
RBT	RUBBER TILE
RC	RESILIENT CHANNEL
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN or ROAD
RE	REFER TO or REFERENCE
REC	RECESS(ED)
RECPT	RECEPTACLE
REF	REFRIGERATOR or REFRIGERATED
REINF	REINFORCED
REQD	REQUIRED
RESIL	RESILIENT
REV	REVISE, REVISED or REVISION(S)
RF	RESILIENT FLOORING
RFG	ROOFING
RFL	REFLECTED
RH	RIGHT HAND
RL	RAIN LEADER
RM	ROOM
RO	ROUGH OPENING
ROD	ROOF OVERFLOW DRAIN
ROW	RIGHT OF WAY
RPM	REVOLUTIONS PER MINUTE
RVS	REVERSE (SIDE)
RWC	RAIN WATER CONDUCTOR
S	SOUTH
SAM	SELF-ADHERED MEMBRANE
SAT	SUSPENDED ACOUSTICAL TILE
SC	SOLID CORE
SCD	SEAT COVER DISPENSER
SCHED	SCHEDULE
SD	SOAP DISPENSER
SEC	SECTION
SF	SQUARE FEET or STOREFRONT
SHT	SHEET
SHTG	SHEATHING
SHWR	SHOWER
SIM	SIMILAR
SME	STRUCTURED MEDIA ENCLOSURE
SNC	SANITARY NAPKIN CABINET
SND	SANITARY NAPKIN DISPENSER
SNR	SANITARY NAPKIN RECEPTACLE
SOFF	SOFFIT
SPECS	SPECIFICATION(S)
SPKL	SPRINKLER
SPKR	SPEAKER
SPRT	SUPPORT
SQ	SQUARE
SR	SINK RECEPTACLE
SS	STAINLESS STEEL
SSK	SERVICE SINK
STA	STATION
STD	STANDARD
STL	STEEL
STOR	STORAGE
STRUCT	STRUCTURE or STRUCTURAL
SUSP	SUSPEND(ED)
SYM	SYMMETRICAL
SYMB	SYMBOL
SYS	SYSTEM
T	TREAD
T&B	TOP AND BOTTOM
T&G	TONGUE AND GROOVE
TB	TOWEL BAR
TBC	TOP OF BACK OF CURB
TELE	TELEPHONE
TEMP	TEMPORARY or TEMPERATURE
THERM	THERMOSTAT
THK	THICK or THICKNESS
THLD	THRESHOLD
TO	TOP OF
TOC	TOP OF CONCRETE
TOS	TOP OF STEEL
TOW	TOP OF WALL
TPD	TOILET PAPER DISPENSER
TPTN	TOILET PARTITION
TS	TUBE STEEL
TV	TELEVISION
TYP	TYPICAL
UL	UNDERWRITER'S LABORATORY
UNFIN	UNFINISHED
UNO	UNLESS NOTED OTHERWISE
UOS	UNLESS OTHERWISE SPECIFIED
UR	URINAL
USGS	U.S. GEOLOGICAL SURVEY
V	VOLT
VAR	VARY or VARIES
VB	VAPOR BARRIER
VCT	VINYL COMPOSITION TILE
VENT	VENTILATION
VER	VERIFY
VERT	VERTICAL
VEST	VESTIBULE
VIF	VERIFY IN FIELD
VIN	VINYL or SHEET VINYL
VOL	VOLUME
VTR	VENT THROUGH ROOF
VWC	VINYL WALL COVERING
W	WEST or WIDE
W/	WITH
W/C	WATER CLOSET
W/D	WASHER/DRYER
W/O	WITHOUT
W/R	WATER RESISTANT
WC	WALL COVERING
WD	WOOD
WDO	WINDOW
WF	WIDE FLANGE or WOOD FLOORING
WGL	WIRE GLASS
WO	WHERE OCCURS
WP	WATERPROOF(ING)

GRAPHIC STANDARDS

STRUCTURAL GRID



WINDOW IDENTIFICATION



DOOR IDENTIFICATION

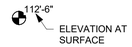
KEYNOTE IDENTIFICATION

ROOM/SPACE IDENTIFICATION

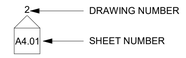
ELEVATION REFERENCE

INTERIOR ELEVATION IDENTIFICATION

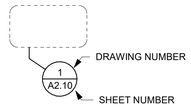
SPOT ELEVATION



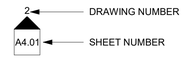
OVERALL EXTERIOR ELEVATION IDENTIFICATION



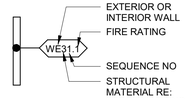
ENLARGED DETAIL IDENTIFICATION



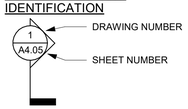
EXTERIOR ELEVATION IDENTIFICATION



PARTITION TYPE IDENTIFICATION

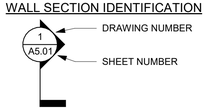


BUILDING SECTION IDENTIFICATION

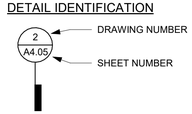


FINISH MATERIAL TAG

WALL SECTION IDENTIFICATION



DETAIL IDENTIFICATION



VICINITY MAP

VICINITY MAP

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

BID SET

03/25/2022

BUILDING INFORMATION

PROJECT ADDRESS:

619 GRANITE ST. FRISCO, CO 80443

PROJECT SCOPE:

NEW CONSTRUCTION OF TWO PERMANENTLY AFFORDABLE RESIDENTIAL BUILDINGS AND A NEW PARKING LOT WITH CARPORT STRUCTURES. RESIDENTIAL BUILDINGS ARE WOOD FRAMED, THREE-STORIES OF TYPE 5B CONSTRUCTION. 22 TOTAL DWELLING UNITS (11 IN EACH BUILDING).

APPLICABLE CODES:

BUILDING - IBC 2018*
PLUMBING - IPC 2018*
MECHANICAL - IMC 2018*
ELECTRICAL - NEC 2020*
FIRE - IFC 2018*
ACCESSIBILITY - ANSI A117.1 - 2009 & C.R.S.
(*) STANDARDS ADOPTED AS AMENDED BY THE TOWN OF FRISCO ON 04/14/2020
TOWN OF FRISCO LOCAL AMENDMENTS

PROJECT TEAM

CO-OWNER
TOWN OF FRISCO
1 Main St.
Frisco, CO 80443
Don Reimer, Community Development Director
970.668.9130
DonR@townoffrisco.com

CO-OWNER
CDOT
2829 W Howard Pl,
Denver, CO 80204
Erin Lucero, CDOT Property Manager
720.737.6591
erin.lucero@state.co.us

ARCHITECT
STUDIO ARCHITECTURE
3575 Ringsby Court, Suite 300A
Denver, CO 80216
Jeff Dawson, Principal
720.771.0516
jeff@theSTUDIOarchitecture.com

CIVIL
JVA
47 Cooper Creek Way, #328
Winter Park, CO 80482
Kevin Vecchiarelli, Principal
303.565.4967
kvecchiarelli@jvajva.com

LANDSCAPE
OUTSIDE LA
Sandi Gibson, Principal
303.517.9256
osla@me.com

STRUCTURAL
STUDIO NYL
2995 Baseline Road, Suite 314
Boulder, CO 80303
Ted Godfrey, Principal
303.558.3145 x104
tgodfrey@studionyl.com

MECHANICAL/PLUMBING
MDP Engineering Group
1800 Glenarm Place 8th Floor
Denver, CO 80202
Brandon Mestler, Principal
303.389.0095
bmestler@mdpeg.com

ELECTRICAL
MDP Engineering Group
1800 Glenarm Place 8th Floor
Denver, CO 80202
Jeron Mamula, Principal
303.389.0095
jmamula@mdpeg.com

GENERAL CONTRACTOR
TBD

SUSTAINABILITY
DEEPER GREEN CONSULTING
101 W Main St Suite 103,
Frisco, CO 80443
Matt Wright
Chief Building Scientist
970.471.4298 x6
matt@deepergreenconsulting.com

CITY APPROVAL

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

COVER SHEET

G000

PLOT DATE: 3/28/2022 3:04:59 PM

COPYRIGHT©

SHEET INDEX - BID SET

SHEET #	SHEET NAME	BID SET
G000	COVER SHEET	•
G001	SHEET INDEX	•
G002	GENERAL NOTES	•
G003	CODE ANALYSIS	•
SURVEY		
1 OF 1	IMPROVEMENT SURVEY PLAT & TOPO INFO	•
CIVIL		
CG001	GENERAL LEGEND, NOTES, AND ABBREVIATIONS	•
CG100	DEMOLITION PLAN	•
CG101	EROSION CONTROL PLAN	•
CG102	GRADING AND DRAINAGE PLAN	•
CG103	STORM SEWER PLAN	•
CG104	UTILITY PLAN	•
CG105	SITE PLAN	•
CG501	EROSION CONTROL DETAILS	•
CG502	EROSION CONTROL DETAILS	•
CG503	EROSION CONTROL DETAILS	•
CG504	EROSION CONTROL DETAILS	•
CG505	EROSION CONTROL DETAILS	•
CG506	GRADING AND DRAINAGE DETAILS	•
CG507	GRADING AND DRAINAGE DETAILS	•
CG508	GRADING AND DRAINAGE DETAILS	•
CG509	GRADING AND DRAINAGE DETAILS	•
CG510	UTILITY DETAILS	•
CG511	SITE DETAILS	•
CG512	SITE DETAILS	•
LANDSCAPE		
LG001	LANDSCAPE NOTES & DETAILS	•
LG101	LANDSCAPE PLAN	•
IRRIGATION		
IG101	IRRIGATION PLAN	•
IG501	IRRIGATION DETAILS	•
GENERAL		
01 STRUCTURAL		
SG000	GENERAL NOTES	•
SG001	GENERAL NOTES	•
SG002	ABBREVIATIONS, SYMBOLS, LEGENDS & SCHEDULES	•
SG003	GRAPHICAL GENERAL NOTES	•
SG004	GRAPHICAL GENERAL NOTES	•
SG005	GRAPHICAL GENERAL NOTES	•
SG006	GRAPHICAL GENERAL NOTES	•
02 ARCHITECTURAL		
AG001	VERTICAL ASSEMBLY DETAILS	•
AG002	HORIZONTAL ASSEMBLY DETAILS	•
AG011	UL U305	•
AG012	UL U305 (CONT'D)	•
AG013	UL U309	•
AG014	UL U309 (CONT'D)	•
AG015	UL U337	•
AG016	UL U341	•
AG017	UL U341 (CONT'D)	•
AG018	UL L570	•
AG019	UL L570 (CONT'D)	•
AG020	UL L570 (CONT'D)	•
AG021	UL P531	•
AG031	GENERAL ACCESSIBILITY DETAILS	•
AG032	ACCESSIBILITY DETAILS - TYPE A	•
AG033	ACCESSIBILITY DETAILS - TYPE B	•
AG041	ENERGY RATING SPECIFICATION - L1	•
AG042	ENERGY RATING SPECIFICATION - L1 (CONTD.)	•
AG043	ENERGY RATING SPECIFICATION - L3	•
AG044	ENERGY RATING SPECIFICATION - L3 (CONTD.)	•
AG101	ARCHITECTURAL SITE PLAN	•
AG102	CODE SITE PLAN	•
AG111	UNIT S.1 - FLOOR PLANS & ELEVATIONS	•
AG112	UNIT S.2 - FLOOR PLANS & ELEVATIONS	•
AG113	UNIT 1.1 - FLOOR PLANS & ELEVATIONS	•
AG114	UNIT 1.2 - FLOOR PLANS & ELEVATIONS	•
AG115	UNIT 1.3 - FLOOR PLANS & ELEVATIONS	•
AG116	UNIT 1.3A - FLOOR PLANS & ELEVATIONS	•
AG117	UNIT 1.4 - FLOOR PLANS & ELEVATIONS	•
AG118	UNIT 2.1 - FLOOR PLANS & ELEVATIONS	•
AG501	DOOR HEAD DETAILS	•
AG502	DOOR THRESHOLD DETAILS	•
AG503	WINDOW HEAD DETAILS	•
AG504	WINDOW JAMB DETAILS	•
AG505	WINDOW SILL DETAILS	•
AG511	PLAN DETAILS	•
AG521	SECTION DETAILS @ FOUNDATION	•
AG522	SECTION DETAILS	•
AG531	ROOF DETAILS @ EAVES	•
AG532	ROOF DETAILS @ RAKES	•
AG533	ROOF DETAILS	•
AG534	ROOF DETAILS	•
AG541	DECK & RAILING DETAILS	•
AG551	AIR SEALING DETAILS - INTERIOR	•
AG552	AIR SEALING DETAILS - EXTERIOR	•
AG601	DOOR SCHEDULE	•
AG602	WINDOW SCHEDULE	•
AG603	FINISH SCHEDULE	•
03 PLUMBING		
PG000	PLUMBING SCHEDULES	•
PG001	PLUMBING DETAILS	•
PG002	PLUMBING DETAILS	•
04 MECHANICAL		
MG000	MECHANICAL LEGEND AND SHEET INDEX	•
MG001	MECHANICAL GENERAL NOTES	•
MG002	MECHANICAL SCHEDULES	•
MG003	MECHANICAL DETAILS	•
MG004	MECHANICAL DETAILS	•
05 ELECTRICAL		
EG000	ELECTRICAL LEGEND AND SHEET INDEX	•
EG001	ELECTICAL GENERAL NOTES	•
EG002	ELECTRICAL ONE-LINE DIAGRAM	•
EG003	ELECTRICAL SCHEDULES	•
EG004	ELECTRICAL SCHEDULES	•
EG005	FEEDERS BRANCH CIRCUITS SCHEDULE	•
EG101	ELECTRICAL SITE PLAN	•
EG401	ENLARGED TYPICAL UNIT ELECTRICAL PLANS	•
EG402	ENLARGED TYPICAL UNIT ELECTRICAL PLANS	•

SHEET INDEX - BID SET

SHEET #	SHEET NAME	BID SET
EG403	ENLARGED TYPICAL UNIT ELECTRICAL PLANS	•
WEST BUILDING		
01 STRUCTURAL		
SW100	SNOW LOADING PLANS	•
SW101	FOUNDATION & LEVEL 2 PLAN - WEST BUILDING	•
SW102	LEVEL 3 & ROOF PLAN - WEST BUILDING	•
SW201	FOUNDATION ISOMETRIC VIEWS - WEST BUILDING	•
SW202	FRAMING ISOMETRIC VIEWS - WEST BUILDING	•
SW501	FOUNDATION DETAILS - WEST BUILDING	•
SW502	FRAMING DETAILS - WEST BUILDING	•
02 ARCHITECTURAL		
AW001	CODE PLAN LEVEL 1 - WEST BUILDING	•
AW002	CODE PLANS LEVEL 2 & 3 - WEST BUILDING	•
AW003	CODE ELEVATIONS - WEST BUILDING	•
AW004	CODE SECTIONS - WEST BUILDING	•
AW101	LEVEL 1 & 2 OVERALL FLOOR PLANS - WEST BUILDING	•
AW102	LEVEL 3 & ROOF OVERALL PLANS - WEST BUILDING	•
AW201	BUILDING ELEVATIONS - WEST BUILDING	•
AW221	COLORED ELEVATIONS - WEST BUILDING	•
AW301	BUILDING SECTIONS - WEST BUILDING	•
AW311	WALL SECTIONS - WEST BUILDING	•
AW312	WALL SECTIONS - WEST BUILDING	•
AW313	WALL SECTIONS - WEST BUILDING	•
AW401	WEST STAIR - WEST BUILDING	•
AW402	EAST STAIR - WEST BUILDING	•
03 PLUMBING		
PW101	WEST LEVELS 1 & 2 PLUMBING PLAN	•
PW102	WEST LEVELS 3 & ROOF PLUMBING PLAN	•
PW201	WEST WASTE AND VENT ISOMETRICS	•
PW202	WEST DOMESTIC WATER ISOMETRICS	•
04 MECHANICAL		
MW101	WEST LEVELS 1 & 2 HVAC PLAN	•
MW102	WEST LEVELS 3 & ROOF HVAC PLAN	•
05 ELECTRICAL		
EW101	WEST LIGHTING PLANS	•
EW102	WEST POWER PLAN	•
EW103	WEST ROOF POWER PLAN	•
EAST BUILDING		
01 STRUCTURAL		
SE100	SNOW LOAD PLANS	•
SE101	FOUNDATION & LEVEL 2 PLAN - EAST BUILDING	•
SE102	LEVEL 3 & ROOF PLAN - EAST BUILDING	•
SE201	FOUNDATION ISOMETRIC VIEWS	•
SE202	FRAMING ISOMETRIC VIEWS	•
SE501	FOUNDATION DETAILS - EAST BUILDING	•
SE502	FRAMING DETAILS - EAST BUILDING	•
02 ARCHITECTURAL		
AE001	CODE PLAN LEVEL 1 - EAST BUILDING	•
AE002	CODE PLANS LEVEL 2 &3 - EAST BUILDING	•
AE003	CODE ELEVATIONS - EAST BUILDING	•
AE004	CODE SECTIONS - EAST BUILDING	•
AE101	LEVEL 1 & 2 OVERALL FLOOR PLANS - EAST BUILDING	•
AE102	LEVEL 3 & ROOF OVERALL PLANS - EAST BUILDING	•
AE201	BUILDING ELEVATIONS - EAST BUILDING	•
AE211	COLORED ELEVATIONS - EAST BUILDING	•
AE301	BUILDING SECTIONS - EAST BUILDING	•
AE311	WALL SECTIONS - EAST BUILDING	•
AE312	WALL SECTIONS - EAST BUILDING	•
AE313	WALL SECTIONS - EAST BUILDING	•
AE401	SOUTH STAIR - EAST BUILDING	•
AE402	NORTH STAIR - EAST BUILDING	•
03 PLUMBING		
PE101	EAST LEVELS 1 & 2 PLUMBING PLAN	•
PE102	EAST LEVELS 3 & ROOF PLUMBING PLAN	•
PE201	EAST WASTE AND VENT ISOMETRICS	•
PE202	EAST DOMENSTIC WATER ISOMETRICS	•
04 MECHANICAL		
ME101	EAST LEVELS 1 & 2 HVAC PLAN	•
ME102	EAST LEVELS 3 & ROOF HVAC PLAN	•
05 ELECTRICAL		
EE101	EAST LIGHTING PLANS	•
EE102	EAST POWER PLANS	•
EE103	EAST ROOF POWER PLAN	•
CARPORTS		
01 STRUCTURAL		
SC000	GENERAL NOTES	•
SC101	CARPORT FOUNDATION PLAN	•
SC102	CARPORT ROOF PLAN	•
SC501	CARPORT FOUNDATION DETAILS	•
02 ARCHITECTURAL		
AC101	PLANS & ELEVATIONS - CARPORT A	•
AC102	FLOOR PLAN & ELEVATIONS - CARPORT B	•
AC103	ROOF PLAN - CARPORT B	•

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

0" 1" THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

SHEET INDEX

G001

PLOT DATE: 3/29/2022 9:17:24 AM

COPYRIGHT©

MASTER GENERAL NOTES LIST

THESE GENERAL NOTES ARE GENERALLY ARRANGED IN ACCORDANCE WITH THE MOST RECENT MASTERFORMAT SPECIFICATION GROUPINGS AS ESTABLISHED IN 2004. REFER TO DRAWINGS AND SPECIFICATIONS PREPARED BY THE CONSULTING ENGINEERS FOR ADDITIONAL GENERAL NOTES RELATED TO THEIR WORK. DIVISION PREFIXES AND HEADINGS ARE AS FOLLOWS:

ADDITIONAL GROUPINGS ARE USED TO CATEGORIZE RELATED WORK AND ASSEMBLIES:

01 00 00 GENERAL REQUIREMENTS
05 00 00 METALS
06 00 00 WOOD, PLASTICS AND COMPOSITES
07 00 00 THERMAL AND MOISTURE PROTECTION
08 00 00 OPENINGS (DOORS AND WINDOWS)
09 00 00 FINISHES
10 00 00 SPECIALTIES
12 00 00 FURNISHINGS
21 00 00 FIRE SUPPRESSION
23 00 00 HEATING, VENTILATION AND AIR CONDITIONING
26 00 00 ELECTRICAL
28 00 00 ELECTRONIC SAFETY AND SECURITY
32 00 00 EXTERIOR IMPROVEMENTS
33 00 00 UTILITIES

01 00 00 GENERAL REQUIREMENTS

01 01 00 WORK SHALL COMPLY WITH ALL LAWS, RULES AND REGULATIONS AS REQUIRED BY THE STATE OF COLORADO AND ANY AND ALL OTHER GOVERNMENTAL AGENCIES HAVING JURISDICTION OVER THE WORK.

01 02 00 WORK SHALL COMPLY WITH THE MODEL CODES LOCALLY IN FORCE AT THE TIME OF BUILDING PERMIT ISSUANCE, INCLUDING ALL REVISIONS AND AMENDMENTS ADOPTED BY THE GOVERNING JURISDICTION(S). WHERE REFERENCE IS MADE TO MODEL CODE SECTIONS AND PARTS, THE CONTRACTOR SHALL BECOME FAMILIAR WITH THE MODEL CODE SECTIONS AND PARTS CITED PRIOR TO INSTALLATION OF ANY AFFECTED WORK.

01 03 00 CONTRACTOR AND EACH OF THEIR SUBCONTRACTORS SHALL FULLY REVIEW THE ENTIRE SET OF CONSTRUCTION DOCUMENTS PRIOR TOCONSTRUCTION. THE CONSTRUCTION DOCUMENTS MAY INCLUDE ANY OR ALL OF THE FOLLOWING:

01 03 01 PROJECT MANUAL/SPECIFICATIONS
01 03 02 CIVIL DRAWINGS
01 03 03 LANDSCAPE DRAWINGS
01 03 04 ARCHITECTURAL DRAWINGS
01 03 05 STRUCTURAL DRAWINGS
01 03 06 MECHANICAL DRAWINGS
01 03 07 PLUMBING DRAWINGS
01 03 08 ELECTRICAL DRAWINGS
01 03 09 FIRE PROTECTION DRAWINGS
01 03 10 INTERIOR DESIGN DRAWINGS

01 04 00 ONLY COMPLETE BUILDING SYSTEMS AND SUBSYSTEMS WHICH ARE IN COMPLETE COORDINATION WITH THE WORK OF ALL DESIGN AND CONSTRUCTION DISCIPLINES INVOLVED SHALL BE BUILT OR INSTALLED.

01 05 00 WHERE CONFLICT OCCURS BETWEEN THE DRAWINGS OF ANY OF THE DESIGN DISCIPLINES INVOLVED, THE MOST RESTRICTIVE INTERPRETATION OF THE OVERALL DESIGN WILL GOVERN THE WORK. THE ARCHITECT WILL RESOLVE DESIGN CONFLICTS BASED ON THE DESIGN INTENT.

01 06 00 GENERAL CONTRACTOR SHALL COORDINATE ALL CHANGES AND ADJUSTMENTS TO THE WORK WHICH VARY FROM THE CONSTRUCTION DOCUMENTS WITH ARCHITECT AND DESIGN TEAM PRIOR TO PUTTING WORK IN PLACE.

01 07 00 ALL PRODUCT BRANDS AND TRADEMARKS NAMED IN THESE DRAWINGS ARE INTENDED TO ESTABLISH AN ACCEPTABLE LEVEL OF QUALITY AND MAY BE SUBSTITUTED FOR PRODUCTS OF EQUAL OR BETTER QUALITY SUBJECT TO THE FORMAL APPROVAL PROCESS AS DEFINED BY THE OWNER/ARCHITECT AND OWNER/CONTRACTOR AGREEMENTS.

01 08 00 SYMBOL REFERENCES ARE TYPICAL AND APPLY EQUALLY TO ALL SIMILAR CONDITIONS UNLESS OTHERWISE NOTED OR OTHERWISE REFERENCED IN THE ARCHITECTURAL DRAWINGS. SEE THE SYMBOLS LEGEND FOR DEFINITION OF ALL SYMBOLS USED IN THE DRAWINGS.

01 09 00 KEYNOTE REFERENCES ARE TYPICAL AND APPLY EQUALLY TO ALL SIMILAR CONDITIONS UNLESS OTHERWISE NOTED OR OTHERWISE REFERENCED IN THE ARCHITECTURAL DRAWINGS. SEE THE KEYNOTES LEGEND ON EACH SHEET FOR DEFINITION OF KEYNOTES USED IN THE DRAWINGS.

01 10 00 DETAIL REFERENCES ARE TYPICAL AND APPLY EQUALLY TO OTHER SIMILAR CONDITIONS UNLESS OTHERWISE NOTED OR OTHERWISE REFERENCED IN THE ARCHITECTURAL DRAWINGS.

01 11 00 DO NOT SCALE DRAWINGS.

01 12 00 ALL DIMENSIONS SHALL BE VERIFIED IN FIELD. DISCREPANCIES SHALL BEBROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO THE WORK BEING DONE.

01 13 00 ALL EXTERIOR WALL DIMENSIONS ARE TO FACE OF SHEATHING UNLESS NOTED OTHERWISE. ALL INTERIOR WALL DIMENSIONS ARE TO FACE OF STUD UNLESS NOTED OTHERWISE. DIMENSIONS NOTED OTHERWISE SHALL BE LABELED AS ONE OF THE FOLLOWING:

01 13 01 CL = CENTERLINE
01 13 02 FOBL = FACE OF BRICK LEDGE
01 13 03 FOF = FACE OF FINISH

01 14 00 1/8" SCALE PLANS SHOW BUILDING EXTERIOR DIMENSIONS AND ANY WALL AND PARTITION DIMENSIONS NOT SHOWN ELSEWHERE. SEE THE ENLARGED 1/4" SCALE PLANS AND UNIT PLANS FOR INTERIOR DIMENSIONS, AND ADDITIONAL DIMENSIONS/INFORMATION NOT SHOWN.

01 15 00 VERTICAL DIMENSIONS ARE FROM TOP OF FINISH FLOOR TO TOP OF PLATE UNLESS OTHERWISE NOTED OR CALLED OUT IN THE DRAWINGS. "FINISH FLOOR" REFERS TO THE TOP OF THE CONCRETE SLAB, TOP OF LIGHTWEIGHT GYPSUM OR CONCRETE FLOOR TOPPING, OR TOP OF PLYWOOD FLOOR SHEATHING IF NO TOPPING IS REQUIRED.

01 16 00 VERIFY ALL BUILT-IN EQUIPMENT SIZES AND REQUIREMENTS PRIOR TO LAYOUT AND CONSTRUCTION. COMPLY WITH THE MANUFACTURER'S INSTALLATION RECOMMENDATIONS.

01 17 00 HANDRAILS SHALL BE INSTALLED 34 INCHES MINIMUM TO 38 INCHES MAXIMUM ABOVE FINISH FLOOR ELEVATION.

01 17 00 PROVIDE 42" HIGH GUARDRAILS AT PORCHES, BALCONIES AND OPEN SIDES OF LANDINGS AND STAIRS WHICH ARE GREATER THAN 30" HIGH ABOVE ADJACENT GROUND OR FLOOR SURFACE. OPEN RAILINGS MUST BE CONSTRUCTED SO THAT A 4" SPHERE CANNOT PASS BETWEEN OBSTRUCTIONS. (I.B.C. CHAPTER 10, SECTION 1012)

05 00 00 METALS

05 01 00 PROVIDE GALVANIC ISOLATION BETWEEN DISSIMILAR METALS.

05 02 00 THE SEISMIC JOINT COVER SUPPLIER SHALL PROVIDE A COMPLETE DESIGN FOR ALL CONDITIONS INCLUDING METHODS OF DRAINAGE FOR WATER BARRIERS AT SEISMIC JOINT COVERS

06 00 00 WOOD, PLASTICS AND COMPOSITES

06 01 00 ALL WOOD IN CONTACT WITH CONCRETE OR MASONRY SHALL BE PRESSURE TREATED WITH AN APPROVED PRESERVATIVE. PRESSURE TREATED WOOD (WITH PRESERVATIVE OR WITH FIRE RETARDANT) SHALL BE APPROVED AND DOCUMENTED AS BEING ACCEPTABLE TO ALL AGENCIES HAVING JURISDICTION OVER THE WORK.

06 02 00 ANY AND ALL EQUIPMENT, ACCESSORIES, AND APPURTENANCES WHICH ARE MOUNTED ON STUD WALLS ARE REQUIRED TO BE ATTACHED THROUGH THE WALL FINISH INTO SOLID WOOD BLOCKING UNLESS THE MANUFACTURER SPECIFICALLY RECOMMENDS OTHERWISE. PROVIDE SOLID 2x10 WOOD BLOCKING SECURELY NAILED OR SCREWED AT ALL LOCATIONS UNLESS NOTED OTHERWISE OR INDICATED DIFFERENTLY IN DRAWINGS OR MANUFACTURER'S INSTRUCTIONS.

06 03 00 WHERE SHEAR PANEL SHEATHING IS REQUIRED IN ONLY A PORTION OF A STUD WALL IN AN EXPOSED LOCATION, THE REMAINDER OF THE STUD WALL SHALL BE EITHER FURRED OUT TO ALIGN WITH THE SHEAR PANEL SHEATHING OR ENTIRELY SHEATHED TO CREATE A FLUSH FINISHED WALL SURFACE.

06 04 00 AT BUILDING PERIMETER SHEAR PANEL LOCATIONS, SILL PLATES, HOLD-DOWNS, ANCHOR BOLTS, AND OTHER RELATED COMPONENTS SHALL BE LOCATED BACK FROM THE EDGE OF CONCRETE SO THAT THE EXTERIOR FACE OF PLYWOOD SHEATHING ALIGNS WITH THE EXTERIOR FACE OF THE CONCRETE FOUNDATION

07 00 00 THERMAL AND MOISTURE PROTECTION

07 01 00 CRICKETS TO BE PROVIDED AT ALL ROOF TOP EQUIPMENT PLATFORMS FOR POSITIVE DRAINAGE

07 02 00 COORDINATE ALL ROOF PENETRATION REQUIREMENTS FOR MECHANICAL, PLUMBING, ELECTRICAL, AND SECURITY SYSTEM REQUIREMENTS.

07 03 00 COORDINATE ALL ROOF MOUNTED EQUIPMENT REQUIREMENTS FOR MECHANICAL, PLUMBING, ELECTRICAL, AND SECURITY SYSTEM REQUIREMENTS.

08 00 00 OPENINGS (DOORS AND WINDOWS)

08 01 00 ALL EXIT DOORS SHALL BE OPERABLE FROM INSIDE WITHOUT THE USE OF A KEY, SPECIAL KNOWLEDGE, OR EFFORT. DEAD BOLTS OR SIMILAR DEVICES ARE PROHIBITED ON EXITS.

08 02 00 WHERE DOORS ARE LOCATED NEXT TO A WALL, THERE SHALL BE 3-1/2' MIN. CLEARANCE BETWEEN WALL FINISH SURFACE AND FACE OF DOOR IN 90 DEGREE OPEN POSITION, UNLESS DETAILED OR DIMENSIONED OTHERWISE.

08 03 00 ALL DOORS BETWEEN CORRIDORS AND ADJACENT ROOMS SHALL BE EQUIPPED WITH ACCEPTABLE POSITIVE LATCHING DEVICES.

08 04 00 MAXIMUM EFFORTS TO OPERATE DOORS SHALL NOT EXCEED THE FOLLOWING:
08 04 01 A. INTERIOR DOORS - 5 POUNDS±
08 04 02 B. EXTERIOR DOORS - 8.5 POUNDS±
08 04 03 C. FIRE DOORS - 15 POUNDS±

08 05 00 PROVIDE ACCESS PANELS AS REQUIRED FOR ALL MECHANICAL, PLUMBING, AND ELECTRICAL EQUIPMENT AND APPURTENANCES THAT REQUIRE ACCESS FOR MAINTENANCE AND UPKEEP. VERIFY RATING REQUIREMENTS PRIOR TO ORDERING AND INSTALLATION.

08 06 00 ALL RATED FIRE DOORS SHALL BE EQUIPPED WITH SELF-CLOSING DEVICES OR AUTOMATIC CLOSING DEVICES. ALL SUCH DOORS SHALL BE EQUIPPED WITH SMOKE GASKETS.

08 07 00 ALL RATED FIRE DOOR ASSEMBLIES SHALL HAVE A "UL" LABEL PERMANENTLY AFFIXED.

09 00 00 FINISHES

09 01 00 UNLESS OTHERWISE INDICATED, INCIDENTAL EXTERIOR CONSTRUCTIONS SUCH AS MINOR ALCOVES, RECESSES, AND PARTIAL EXTERIOR ELEVATIONS NOT SHOWN SHALL HAVE APPLICABLE DETAILS, FEATURES, AND MATERIALS SIMILAR TO IMMEDIATELY ADJACENT CONTIGUOUS EXTERIOR CONSTRUCTION.

09 02 00 UNLESS OTHERWISE INDICATED, INCIDENTAL INTERIOR ELEVATIONS NOT SHOWN IN THE DRAWINGS WHICH ARE SUBORDINATE AND ACCESSORY TO SPACES ADDRESSED IN THE FINISH SCHEDULE SHALL BE FINISHED IDENTICALLY TO THOSE SPACES TO WHICH THEY ARE ACCESSORY.

09 03 00 PROVIDE SUSPENDED CEILINGS AND FURRED-OUT SURFACES WHERE REQUIRED TO CONCEAL PIPING, DUCT, ETC. IN FINISHED ROOMS. SHOULD CONDITIONS NECESSITATE ALTERATIONS IN INDICATED CEILING HEIGHTS DUE TO STRUCTURAL OR MECHANICAL REQUIREMENTS, OBTAIN APPROVAL FROM ARCHITECT BEFORE INSTALLING FURRING. THERE SHALL BE NO EXPOSED CONSTRUCTION, PLUMBING, ELECTRICAL, MECHANICAL, OR LIKE SYSTEMS UNLESS NOTED OTHERWISE IN THE FINISH SCHEDULE.

09 04 00 THE CONTRACTOR SHALL COORDINATE ALL DRYWALL SOFFITS, SOFFIT FRAMING, AND SUSPENDED DRYWALL CEILINGS WITH MECHANICAL, PLUMBING, ELECTRICAL, SECURITY, FIRE ALARM, FOOD SERVICE (IF ANY), AND FIRE PROTECTION REQUIREMENTS.

09 05 00 PROVIDE GYPSUM BOARD PRODUCTS TESTED AND PROVEN SUITABLE FOR EACH APPLICATION'S LOCATION, ACOUSTIC AND FIRE-RATING REQUIREMENT. PROVIDE TEST REPORTS FOR EACH ASSEMBLY.

09 06 00 ALL INTERIOR GYPSUM WALLBOARD INSTALLATIONS SHALL BE TAPED, FILLED, AND SANDED READY TO RECEIVE FINISH. REPAIR ALL SURFACE IMPERFECTIONS AND IRREGULARITIES.

09 07 00 DEMISING WALL ASSEMBLIES SEPARATING A DWELLING UNIT FROM OTHER DWELLING UNITS OR INTERIOR COMMON SPACES MUST PROVIDE A MINIMUM SOUND TRANSMISSION CLASS (STC) OF 50 AS INDICATED BY VALID ASSEMBLY TEST REPORTS. IT IS THE CONTRACTORS RESPONSIBILITY TO OBTAIN AND ABIDE BY ALL PERTINENT TEST REPORTS RELATIVE TO SOUND TRANSMISSION FOR PRODUCTS AND MATERIALS PURCHASED. STC AND IIC RATINGS OF 45 ARE ACCEPTABLE IF VERIFIED BY FIELD TESTING WHICH MAY BE REQUIRED AT THE DISCRETION OF THE BUILDING OFFICIAL, OWNER OR ARCHITECT. A TEST REPORT SHOWING COMPLIANCE OR NON-COMPLIANCE SHALL BE SUBMITTED TO THE BUILDING OFFICIAL, OWNER AND ARCHITECT. REFER TO WALL TYPES AND ACOUSTICAL DETAIL SHEETS FOR RELATED INFORMATION. (I.B.C. CHAPTER 12, SECTION 1207)

09 08 00 AN APPROVED PERMANENT AND RESILIENT ACOUSTICAL SEALANT SHALL BE PROVIDED ALONG THE JOINT BETWEEN THE FLOOR AND THE BOTTOM EDGE OF THE GYPSUM WALLBOARD AT ALL UNIT-TO-UNIT DEMISING WALLS. THE JOINT BETWEEN THE CEILING SURFACE AND THE TOP EDGE OF THE DEMISING WALL GYPSUM WALLBOARD PANEL SHALL BE SIMILARLY SEALED OR FULLY TAPED AND FINISHED WITH JOINT COMPOUND. GYPSUM BOARD ENDS SHOULD NOT COME INTO CONTACT WITH WOOD STRUCTURE.

09 09 00 ANY AND ALL POTENTIAL PASSAGES WHICH MAY ALLOW SOUND PENETRATION FROM ONE UNIT TO ANOTHER SHALL BE FULLY SEALED.

09 10 00 ALL PENETRATIONS INTO SOUND RATED WALLS, PARTITIONS OR FLOOR-CEILING ASSEMBLIES SHALL BE SEALED WITH AN ACOUSTICAL PERMANENT RESILIENT ACOUSTICAL SEALANT.

09 11 00 THERE SHALL BE NO VENTILATING OR CONDITIONED AIR DUCTS LOCATED IN SOUND RATED ASSEMBLIES UNLESS SPECIFICALLY SHOWN IN THE DRAWINGS. VENTILATING OR CONDITIONED AIR DUCTS LOCATED IN SOUND RATED ASSEMBLIES SHALL BE FULLY LINED.

09 12 00 SOUND PRODUCING DEVICES SUCH AS SPEAKERS OR FANS SHALL NOT BE PERMITTED IN THE SOUND RATED ASSEMBLIES.

09 13 00 ENTRANCE DOORS TO RESIDENTIAL UNITS FROM INTERIOR CORRIDORS SHALL HAVE A MINIMUM STC 26 RATING.

09 14 00 RESILIENT CHANNELS SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATION AND THE REQUIREMENTS OF THE APPROPRIATE FIRE RATED ASSEMBLY. VERIFY ALL GYPSUM BOARD IS PROPERLY SCREWED INTO THE CHANNEL IN ORDER TO ELIMINATE SOUND TRANSFER. VERIFY CHANNEL IS CENTERED ON WOOD STUD OR TRUSS.

NOTE: REFER TO THE FIRE PROTECTION NOTES FOR ADDITIONAL REQUIREMENTS RELATED TO GYPSUM BOARD

10 00 00 SPECIALTIES

10 01 00 STREET ADDRESS SIGNAGE MUST BE PROVIDED ON THE FRONT OF THE BUILDING. NUMBERS MUST BE VISIBLE FROM THE STREET, MUST BE OF A COLOR WHICH CONTRASTS WITH THE BACKGROUND, MUST BE AT LEAST 4-INCHES IN HEIGHT AND 2-INCHES IN WIDTH, AND MUST FACE THE

10 02 00 FIRE EXTINGUISHERS SHALL BE PROVIDED AS REQUIRED BY FIRE DEPT. FIELD INSPECTORS AND AS SHOWN ON PLANS. TRAVEL DISTANCE SHALL NOT BE MORE THAN 75' TO ANY FIRE EXTINGUISHER LOCATION

10 03 00 PROVIDE CONSPICUOUSLY MARKED OUTSIDE GAS SHUTOFF VALVE.

10 04 00 AN APPROVED PICTORIAL SIGN SHALL BE POSTED ADJACENT TO EACH ELEVATOR CALL STATION WHICH SPECIFIES "IN CASE OF FIRE, DO NOT USE ELEVATORS; USE STAIRS."

12 00 00 FURNISHINGS (CABINETS AND CASEWORK)

12 01 00 ALL UPPER AND LOWER CABINETS TO BE FLUSH OVERLAY UNLESS NOTED OTHERWISE.

12 02 00 VERIFY ALL CLEAR OPENINGS OF CONSTRUCTION BEFORE FABRICATION OF CASEWORK.

12 03 00 VERIFY ALL EQUIPMENT SIZES BEFORE FABRICATION OF CASEWORK. KITCHEN APPLIANCES SHALL FIT SNUGLY WITHIN CASEWORK OPENINGS.

12 04 00 CASEWORK SHALL BE PROVIDED WITH REQUIRED HOLES, GROMMETS, AND ACCESS PANELS FOR ELECTRICAL CABLES.

12 05 00 FILLER PANELS SHALL BE PROVIDED FOR ALL CABINETS LOCATED LESS THAN 6" FROM THE ADJACENT SIDE WALL. BASE CABINET FILLER PANELS SHALL INCLUDE TOE KICKS TO MATCH ADJACENT CABINETS.

12 06 00 NO WORK COUNTER SPACE SHALL BE LESS THAN 24 INCHES DEEP.

12 07 00 PROVIDE END PANEL AT EXPOSED SIDES OF DISHWASHER.

21 00 00 FIRE SUPPRESSION

21 01 00 FIRE BLOCK ALL STUD WALLS AND PARTITIONS AT FLOOR, CEILING, AND MID-HEIGHT. PROVIDE FIRESTOPPING AT 10'-0" MAXIMUM ALONG HORIZONTAL LENGTH OF WALLS.

21 02 00 FIRE PARTITIONS SHALL EXTEND FROM THE TOP OF THE FOUNDATION OR FLOOR/ CEILING ASSEMBLY BELOW TO THE UNDERSIDE OF THE FLOOR OR ROOF SHEATHING, SLAB OR DECK ABOVE OR TO THE FIRE-RESISTANCE-RATED FLOOR/ CEILING OR ROOF/CEILING ASSEMBLY ABOVE AND SHALL BE SECURELY ATTTACHED THERETO.

21 02 01 1. WHERE THE ROOM -SIDE FIRE-RESISTANCE MEMBRANE OF THE CORRIDOR IS CARRIED THROUGH TO THE UNDERSIDE OF THE FLOOR OR ROOF SHEATHING, DECK, OR SLAB OF A FIRE-RESISTANCE-RATED FLOOR OR ROOF ABOVE, THE CEILING OF THE CORRIDOR SHALL BE PERMITTED TO BE PROTECTED BY THE USE OF THE CEILING MATERIAL AS REQUIRED FOR A 1 HOUR FIRE-RESISTANCE -RATED FLOOR OR ROOF SYSTEM

21 02 02 2. WHERE THE CORRIDOR CEILING IS CONSTRUCTED AS REQUIRED FOR THE CORRIDOR WALLS, THE WALLS SHALL BE PERMITTED TO TERMINATE AT THE UPPER MEMBRANE OF SUCH CEILING ASSEMBLY.

21 03 00 THROUGH-PENETRATION FIRE STOPS INSTALLED TO PROVIDE AN F-RATING ARE REQUIRED AT THE FOLLOWING WALLS:

21 03 01 A. FIRE-RESISTANT WALLS.

21 03 02 B. WALLS REQUIRING PROTECTED OPENINGS, I.E. CORRIDOR WALLS, OCCUPANCY SEPARATION AND AREA SEPARATION WALLS.

21 04 00 THROUGH-PENETRATION FIRE STOPS REQUIRE A T-RATING AT THE FOLLOWING LOCATIONS:

21 04 01 A. ABOVE CORRIDOR CEILINGS WHICH ARE NOT PART OF A FIRE-RESISTIVE ASSEMBLY.

21 04 02 B. BELOW ANY CEILING IF THROUGH-PENETRATING ITEM IS LARGER THAN A 4-INCH NOMINAL PIPE OR 16 SQ. INCHES IN OVERALL CROSSSECTIONAL AREA.

21 05 00 METALLIC OUTLET BOXES SHALL BE PERMITTED TO BE INSTALLED IN WOOD AND STEEL STUD WALLS OR PARTITIONS HAVING GYPSUM BOARD FACINGS AND CLASSIFIED AS TWO HOURS OR LESS. THE SURFACE AREA OF INDIVIDUAL BOXES SHALL NOT EXCEED 16 SQUARE INCHES. THE AGGREGATE AREA OF THE BOXES SHALL NOT EXCEED 100 SQUARE INCHES IN ANY 100 SQUARE FEET. BOXES LOCATED IN OPPOSITE FACES OF SOUND RATED WALLS SHALL BE SEPARATED BY TWENTY FOUR INCHES MINIMUM DISTANCE. BACKS AND SIDES OF BOXES SHALL BE SEALED WITH 1/.8 INCH MINIMUM MOLDABLE, SELF-ADHERING "CLAY PAD" TYPE ACOUSTICAL-FIRE PENETRATION SEALANT AND BACKED WITH TWO INCHES MINERAL FIBER OR GLASS FIBER INSULATION. (APPROVED NON-METALLIC BOXES SHALL BE PERMITTED AS ALLOWED BY LOCAL CODE.)

21 05 01 A. PENETRATIONS ARE NOT CONTAINED WITHIN A WALL AT THE POINT WHERE THEY PENETRATE THE FLOOR.

21 05 02 B. PENETRATIONS ARE LARGER THAN A 4-INCH NOMINAL PIPE OR 16 SQ. INCHES IN OVERALL CROSS SECTIONAL AREA.

21 06 00 PROVIDE A FIRE STOP SYSTEM EQUIVALENT TO THE HILTI FIRE STOP SYSTEM DESCRIBED IN ICBO EVALUATION REPORT NO. ER-5071 DATED MARCH 7, 1997. SUBSTITUTIONS SHALL BE APPROVED BY THE BUILDING OFFICIAL PRIOR TO INSTALLATION. HILTI FIRE STOP SYSTEM MATERIALS APPLICATIONS AND INSTALLATIONS ARE AS FOLLOWS:

21 06 01 A. PLASTIC PIPE THROUGH 1-HOUR. OR 2-HOUR FIRE RATED WOOD FLOOR OR CHASE WALL ASSEMBLY:
21 06 02 F = 1-HR OR 2-HR
21 06 03 T = 0, 1, 1-1/2, & 2-HR

21 06 04 B. METAL PIPE/CONDUIT THROUGH 1-HR. OR 2-HR. WOOD FLOOR UTILIZINGFS 601 FIRE STOP SEALANT OR FS-ONE FIRE STOP SEALANT:
21 06 05 F = 1-HR OR 2-HR
21 06 06 T = 1-HR OR 2-HR

21 06 07 C. INSULATED METAL PIPE/CONDUIT THROUGH 1-HR. OR 2-HR. WOOD FLOOR ASSEMBLY UTILIZING FS-ONE FIRE STOP SEALANT:
21 06 08 F = 1-HR OR 2-HR
21 06 09 T = 1-HR OR 2-HR

21 06 10 D. METAL PIPE TROUGH GYPSUM WALL ASSEMBLY UTILIZING FS-ONE HIGH PERFORMANCE INTUMESCENT FIRE STOP SEALANT:
21 06 11 F = 1-HR OR 2-HR
21 06 12 T = 0-HR

21 06 13 E. EMT THROUGH 1-HR. OR 2-HR. GYPSUM WALL ASSEMBLY UTILIZING FSONE HIGH PERFORMANCE INTUMESCENT FIRE STOP SEALANT AND FS-ONE FIRE STOP SEALANT.
21 06 14 F = 1-HR OR 2-HR
21 06 15 T = 0-HR

21 06 16 F. PLASTIC PIPE THROUGH 1-HR. OR 2-HR. GYPSUM WALL ASSEMBLY UTILIZING FS-ONE HIGH PERFORMANCE INTUMESCENT FIRE STOP SEALANT AND HILTI COLLAR COMPONENTS:
21 06 17 F = 1-HR OR 2-HR
21 06 18 T = 1-HR OR 2-HR

21 06 19 G. CABLE BUNDLE THROUGH 1-HR. OR 2-HR. GYPSUM WALL UTILIZING FSF = 1-HR OR 2-HR
21 06 20 T = 0-HR

21 06 21 H. INSULATED METAL PIPE THROUGH 1-HR OR 2-HR GYPSUM WALL UTILIZING FS-ONE FIRE STOP SEALENT UTILIZING FS-ONE FIRE STOP SEALANT.
21 06 22 F = 1-HR OR 2-HR
21 06 23 T = 0-HR

21 06 24 I. MULTIPLE METAL PIPE AND CABLE THROUGH 2-HR GYPSUM WALL UTILIZING FS-ONE FIRE STOP SEALENT AND MINERAL WOOL UTILIZING FS-ONE FIRE STOP SEALANT AND MINERAL WOOL.
21 06 25 F = 2-HR
21 06 26 T = 0-HR

21 07 00 FIBERGLASS BATT INSULATION SHALL BE INSTALLED IN JOIST SPACE WHENEVER A PLUMBING OR DUCT PENETRATES A FLOOR-CEILING ASSEMBLY OR WHERE SUCH UNIT PASSES THROUGH THE PLANE OF A FLOOR-CEILING ASSEMBLY FROM WITHIN A WALL. THE INSULATION SHALL BE INSTALLED TO A POINT TWELVE INCHES BEYOND THE PIPE OR DUCT IN BOTH DIRECTIONS.

21 08 00 ALL INTERIOR CORRIDOR WALL AND CEILING FINISHES SHALL BE INCOMBUSTIBLE AND HAVE A FLAME SPREAD RATING OF 25 OR LESS.

21 09 00 GYPSUM WALLBOARD SOFFITS AND CEILINGS SUSPENDED BELOW A PROTECTED STRUCTURAL FRAME, A RATED FLOOR-CEILING ASSEMBLY OR RATED ROOF-CEILING ASSEMBLY SHALL BE FRAMED WITH METAL OR FIRE-RETARDANT TREATED WOOD MEMBERS.

21 10 00 WALL OPENINGS AND RECESSED ELEMENTS OVER 16 SQ. INCHES IN RATED WALLS MUST BE PROTECTED. THIS INCLUDES WALL CABINETS, RECESSED FIRE HOSE CABINETS, RECESSED FIRE EXTINGUISHER CABINETS, AND RECESSED ELECTRICAL PANELS AND BOXES. RECESSES MUST BE WRAPPED WITH CONTINUOUS TYPE X GYPSUM WALLBOARD SO THAT THE WALL RATING IS UNINTERRUPTED.

21 11 00 SEE MECHANICAL DRAWINGS FOR FLOOR-CEILING AND ROOF-CEILING LOCATIONS WHERE "PRE-DRYWALLING" IS REQUIRED TO MAINTAIN FIRE ASSEMBLY RATING.

21 12 00 AT BUILDINGS WITH LESS THAN THREE UNITS, 5/8 INCH TYPE X GYPSUM WALLBOARD IS REQUIRED ON THE GARAGE SIDE OF ALL UNIT-TO-GARAGE DEMISING WALLS, ON THE GARAGE SIDE OF ALL FLOOR-CEILING ASSEMBLIES ABOVE GARAGES, AND ON THE GARAGE SIDE OF ALL ROOF-CEILING ASSEMBLIES WHICH ARE PART OF AN OCCUPANCY SEPARATION.

21 13 00 DRAPES AND OTHER DECORATIVE MATERIALS SHALL BE FLAME-RETARDANT. CERTIFICATION THEREOF SHALL BE PROVIDED. EXITS, EXIT LIGHTS, FIRE ALARM STATIONS, HOSE CABINETS AND FIRE EXTINGUISHER LOCATIONS SHALL NOT BE CONCEALED BY DECORATIVE MATERIALS.
DRAPES AND OTHER DECORATIVE MATERIALS SHALL BE FLAME-RETARDANT. CERTIFICATION THEREOF SHALL BE PROVIDED. EXITS, EXIT LIGHTS, FIRE ALARM STATIONS, HOSE CABINETS AND FIRE EXTINGUISHER LOCATIONS SHALL NOT BE CONCEALED BY DECORATIVE MATERIALS.

21 14 00 DUCT PENETRATIONS THROUGH FIRE RATED PARTITIONS SHALL BE PROTECTED WITH AUTOMATIC SMOKE/FIRE DAMPERS UNLESS NOTED OR DETAILED OTHERWISE.

21 15 00 FIRE DAMPER ASSEMBLIES, INCLUDING INSTALLATION PROCEDURES, SLEEVES, AND OTHER NECESSARY APPURTENANCES, SHALL BE APPROVED BY THE BUILDING INSPECTOR PRIOR TO INSTALLATION.

21 16 00 LOCATE SPRINKLER HEADS 3'-0" MIN. FROM DIFFUSERS AND 5'-0" FROM DOORS.

21 17 00 FOR SPRINKLER HEAD LOCATIONS, SEE FIRE PROTECTION DRAWINGS. COORDINATE WITH OTHER DISCIPLINES AND RESOLVE CONFLICTS IN CONSULTATION WITH ARCHITECT AND AFFECTED DESIGN TEAM MEMBERS PRIOR TO INSTALLATION.

21 18 00 AN APPROVED FIRE ALARM SYSTEM SHALL BE PROVIDED AS PART OF A TOTAL CAMPUS SYSTEM PER APPLICABLE CODES AND SHALL BE INTERCONNECTED BETWEEN BUILDINGS WHEN REQUIRED BY AUTHORITIES WITH JURISDICTION OVER THE WORK. COORDINATE ELECTRICAL, SECURITY, FIRE ALARM, AND FIRE PROTECTION SYSTEMS.

21 19 00 LOCATE SMOKE DETECTORS AS SHOWN EXCEPT AS FOLLOWS:
21 19 01 A. 3 FEET MINIMUM FROM SUPPLY OR RETURN REGISTERS.
21 19 02 B. 2 FEET MINIMUM AND 5 FEET MAXIMUM FROM AUTOMATIC DOORS.

21 20 00 WHEN NOT SPECIFIED AS A COMPONENT OF A FIRE TESTED WALL OR PARTITION SYSTEM, MINERAL FIBER, GLASS FIBER OR CELLULOSE FIBER INSULATION OF A THICKNESS NOT EXCEEDING THAT OF THE STUD DEPTH SHALL BE PERMITTED TO BE ADDED WITHIN THE STUD CAVITY.

21 21 00 IN FLOOR-CEILING AND ROOF-CEILING SYSTEMS, THE ADDITION OR DELETION OF MINERAL OR GLASS FIBER INSULATION IN CEILING JOIST SPACES COULD POSSIBLY REDUCE THE FIRE RESISTANCE RATING. THE ADDITION OF UP TO 16 3/4 INCHES OF 0.5 PCF GLASS FIBER INSULATION (R-40), EITHER BATT OR LOOSE-FILL, TO ANY 1 OR 2 HOUR FIRE RESISTANCE RATED FLOOR-CEILING OR ROOF-CEILING SYSTEM HAVING A CAVITY DEEP ENOUGH TO ACCEPT THE INSULATION IS PERMITTED PROVIDED THAT ONE ADDITIONAL LAYER OF EITHER 1/2" TYPE X OR 5/8 TYPE X GYPSUM BOARD IS APPLIED TO THE CEILING. THE ADDITIONAL LAYER OF GYPSUM BOARD SHALL BE APPLIED AS DESCRIBED FOR THE FACE LAYER OF THE TESTED SYSTEM EXCEPT THAT THE FASTENER LENGTH SHALL BE INCREASED BY NOT LESS THAN THE THICKNESS OF THE ADDITIONAL LAYER OF GYPSUM BOARD.

21 22 00 EXIT SIGNS SHALL MEET THE FOLLOWING MINIMUM REQUIREMENTS:
21 22 01 A. EXIT SIGNS SHALL BE READILY VISIBLE FROM ANY DIRECTION OF APPROACH.
21 22 02 B. EXIT SIGNS SHALL BE LOCATED TO CLEARLY INDICATE THE DIRECTION OF EGRESS TRAVEL.

23 00 00 HEATING, VENTILATING AND AIR CONDITIONING

23 01 00 WHERE MECHANICAL VENTILATION IS PROVIDED IN LIEU OF NATURAL VENTILATION, PROVIDE AT LEAST TWO AIR CHANGES PER HOUR WITH A MINIMUM OF 15 C.F.M. OF OUTSIDE AIR PER OCCUPANT.

23 02 00 ALL BATHROOMS WITHOUT OPERABLE WINDOWS SHALL BE PROVIDED WITH A MECHANICAL EXHAUST SYSTEM CAPABLE OF FIVE AIR CHANGES PER HOUR.

23 03 00 ALL DRYERS SHALL BE VENTED TO OUTSIDE AIR. COMPLY WITH UMC REQUIREMENTS FOR DUCT DIAMETER, LENGTH, AND NUMBER OF BENDS UNLESS OTHERWISE APPROVED BY THE GOVERNING JURISDICTION.

23 04 00 THE DISCHARGE POINT FOR EXHAUST AIR MUST BE AT LEAST 3'-0" FROM ANY OPENING WHICH ALLOWS AIR ENTRY INTO OCCUPIED PORTIONS OF THE BUILDING.

26 00 00 ELECTRICAL

26 01 00 ALL EXIT WAYS SHALL BE ILLUMINATED BY AN APPROVED EMERGENCY LIGHTING SYSTEM TO OPERATE WHEN THE POWER SOURCE IS INTERRUPTED. PROVIDE HIGH AND LOW EXIT SIGN LIGHTS AT EACH EXIT.

28 00 00 ELECTRONIC SAFETY AND SECURITY

28 01 00 DOOR STOPS OF IN-SWINGING DOORS SHALL BE OF ONE PIECE CONSTRUCTION WITH THE JAMB, OR SHALL BE JOINED BY RAB

CODE ANALYSIS - RESIDENTIAL

PROJECT NAME: GRANITE STREET WORKFORCE HOUSING

PROJECT LOCATION: 619 GRANITE ST. FRISCO, CO 80443

JURISDICTION: CITY OF FRISCO, CO

CODE AUTHORITY: TOWN OF FRISCO BUILDING DIVISION
RICK WEINMAN, BUILDING OFFICIAL

OWNER: CO-OWNERS; COLORADO DEPARTMENT OF TRANSPORTATION (CDOT), AND THE TOWN OF FRISCO

LOT SIZE: 0.56 ACRES PER SURVEY NO. 2462 DATED 11/20/2020, PREPARED BY SCHMIDT LAND SURVEYING

ZONING: CENTRAL CORE

BUILDING DATA:

OCCUPANCY GROUP:	R-2
TYPE OF CONSTRUCTION:	V-B
BUILDING HEIGHT:	3 STORIES / 37'-0"
FIRE PROTECTION:	S13R SPRINKLER SYSTEMS THROUGHOUT

BUILDING SQUARE FOOTAGE (IBC)

EAST BUILDING	9,715 SF
WEST BUILDING	9,947 SF

TOTAL OCCUPANTS:

EAST BUILDING	44 OCCUPANTS
WEST BUILDING	44 OCCUPANTS

APPLICABLE CODES: BUILDING - IBC 2018*
PLUMBING - IPC 2018*
MECHANICAL - IMC 2018*
ELECTRICAL - NEC 2020*
FIRE - IFC 2018*
ACCESSIBILITY - ANSI A117.1 - 2009

(*) STANDARDS ADOPTED AS AMENDED BY THE TOWN OF FRISCO ON 04/14/2020

IBC 2018 ANALYSIS

IBC CHAPTER 3 – USE AND OCCUPANCY CLASSIFICATION

OCCUPANCY CLASSIFICATION: THE PROJECT IS A RESIDENTIAL GROUP R-2 OCCUPANCY FOR THE RESIDENTIAL BUILDINGS AND GROUP U OCCUPANCY FOR THE CARPORTS.

IBC CHAPTER 4 – SPECIAL DETAILED REQUIREMENTS BASED ON OCCUPANCY AND USE

SECTION 420.2 SEPARATION WALLS WALLS SEPARATING DWELLING UNITS IN THE SAME BUILDING, WALLS SEPARATING SLEEPING UNITS IN THE SAME BUILDING AND WALLS SEPARATING DWELLING OR SLEEPING UNITS FROM OTHER OCCUPANCIES CONTIGUOUS TO THEM IN THE SAME BUILDING SHALL BE CONSTRUCTED AS FIRE PARTITIONS IN ACCORDANCE WITH SECTION 708.

IBC CHAPTER 5 – GENERAL BUILDING HEIGHTS AND AREAS

SECTION 504 BUILDING HEIGHT AND NUMBER OF STORIES BUILDINGS OF TYPE V-B CONSTRUCTION WITH AN AUTOMATIC FIRE SPRINKLER SYSTEM INSTALLED THROUGHOUT HAVE THE FOLLOWING TABULAR BUILDING HEIGHT AND NUMBER OF STORY LIMITATIONS:

GROUP	HEIGHT (ALLOWED / ACTUAL)	STORIES (ALLOWED / ACTUAL)
R-2	60'-0" / 37'-0"	3 / 3

SECTION 506 BUILDING AREA BUILDINGS OF TYPE V-B CONSTRUCTION WITH AN AUTOMATIC FIRE SPRINKLER SYSTEM INSTALLED THROUGHOUT HAVE THE FOLLOWING TABULAR BUILDING AREA LIMITATIONS. AREA FACTOR INCREASE BASED ON FRONTAGE NOT NEEDED AND NOT INCLUDED.

BUILDING	GROUP	LEVEL	AREA (ALLOWED)	AREA (ACTUAL)
WEST	R-2	1	7,000 GSF	3,825 GSF
WEST	R-2	2	7,000 GSF	3,825 GSF
WEST	R-2	3	7,000 GSF	2,065 GSF
EAST	R-2	1	7,000 GSF	4,031 GSF
EAST	R-2	2	7,000 GSF	4,031 GSF
EAST	R-2	3	7,000 GSF	1,885 GSF

IBC CHAPTER 6 – TYPES OF CONSTRUCTION

SECTION 602 CONSTRUCTION CLASSIFICATION THE PROJECT IS CLASSIFIED AS TYPE V-B CONSTRUCTION THROUGHOUT. IN TYPE V-B CONSTRUCTION, THE PRIMARY STRUCTURAL FRAME, INTERIOR BEARING WALLS, EXTERIOR BEARING AND NONBEARING WALLS WITH A FIRE SEPARATION DISTANCE OF 10 FEET OR MORE, INTERIOR NONBEARING WALLS, FLOOR CONSTRUCTION AND ASSOCIATED SECONDARY MEMBERS, AND ROOF CONSTRUCTION AND ASSOCIATED SECONDARY MEMBERS ARE ALLOWED TO BE CONSTRUCTED OF ANY MATERIAL ALLOWED IN THE CODE AND ARE NOT REQUIRED TO BE FIRE RESISTANCE RATED. EXTERIOR BEARING AND NONBEARING WALLS WITH A FIRE SEPARATION DISTANCE OF LESS THAN 10 FEET SHALL HAVE A ONE HOUR FIRE RESISTANCE RATING.

ONLY THE EXTERIOR WALLS WITH A FIRE SEPARATION OF LESS THAN 10 FEET ARE RATED DUE TO CONSTRUCTION CLASSIFICATION. REFER TO THE CODE PLANS ON SHEETS AW001, AW002, AE001 & AE002 FOR THE EXTENTS OF FIRE-RESISTANCE RATED CONSTRUCTION.

IBC CHAPTER 7 – FIRE AND SMOKE PROTECTION FEATURES

SECTION 705.5 FIRE RESISTANCE RATING FOR EXTERIOR WALLS EXTERIOR WALLS SHALL BE FIRE RESISTANCE RATED IN ACCORDANCE WITH SECTION 602. THE REQUIRED FIRE RESISTANCE RATING OF EXTERIOR WALLS WITH A FIRE SEPARATION DISTANCE OF GREATER THAN 10 FEET SHALL BE RATED FOR EXPOSURE TO FIRE FROM THE INSIDE. THE REQUIRED FIRE RESISTANCE RATING OF EXTERIOR WALLS WITH A FIRE SEPARATION DISTANCE OF LESS THAN OR EQUAL TO 10 FEET SHALL BE RATED FOR EXPOSURE TO FIRE FROM BOTH SIDES

THE EAST, NORTH, AND WEST SIDES OF THE WEST BUILDING HAVE A FIRE SEPARATION DISTANCE OF LESS THAN 10 FEET AND ARE RATED FOR EXPOSURE FROM BOTH SIDES. THE WEST SIDE OF THE EAST BUILDING HAS A FIRE SEPARATION OF LESS THAN 10 FEET AND IS RATED FOR EXPOSURE FROM BOTH SIDES. REFER TO THE CODE PLANS ON SHEETS AW001, AW002, AE001 & AE002 FOR MORE INFORMATION.

SECTION 705.8 OPENINGS IN EXTERIOR WALLS THE MAXIMUM AREA OF UNPROTECTED AND PROTECTED OPENINGS PERMITTED IN AN EXTERIOR WALL IN ANY STORY OF A BUILDING SHALL NOT EXCEED THE PERCENTAGES SPECIFIED IN TABLE 705.8 BASED ON THE FIRE SEPARATION DISTANCE OF EACH INDIVIDUAL STORY.

THE MAXIMUM AREA OF OPENINGS DOES NOT EXCEED THE PERCENTAGES SPECIFIED IN TABLE 705.8. REFER TO THE CODE ELEVATIONS ON SHEETS AE003 & AW003 TO SEE THE PERCENTAGES OF OPENINGS.

SECTION 707.3.2 FIRE RESISTANCE RATING FOR FIRE BARRIERS AT INTERIOR EXIT STAIRWAY CONSTRUCTION THE FIRE-RESISTANCE RATING OF THE FIRE BARRIER SEPARATING BUILDING AREAS FROM AN INTERIOR EXIT STAIRWAY SHALL COMPLY WITH SECTION 1023.1

THE WALLS SEPARATING THE EXIT STAIRWAYS WILL BE CONSTRUCTED AS FIRE BARRIERS AND WILL HAVE A FIRE-RESISTANCE RATING OF 1 HOUR BECAUSE IT CONNECTS LESS THAN FOUR STORIES. SEE GE021, GE022, GW021 AND GW022 FOR MORE INFORMATION.

SECTION 707.5 CONTINUITY FOR FIRE BARRIERS FIRE BARRIERS SHALL EXTEND FROM THE TOP OF THE FOUNDATION OR FLOOR/CEILING ASSEMBLY BELOW TO THE UNDERSIDE OF THE FLOOR OR ROOF SHEATHING, SLAB OR DECK AND SHALL BE SECURELY ATTACHED THERETO. SUCH FIREBARRIERS SHALL BE CONTINUOUS THROUGH CONCEALED SPACE, SUCH ASE THE SPACE ABOVE A SUSPENDED CEILING

SEE SHEET AG002 FOR DETAIL OF FIRE BARRIER CONTINUITY

SECTION 708.3 FIRE RESISTANCE RATING FOR FIRE PARTITIONS FIRE PARTITIONS SHALL HAVE A FIRE RESISTANCE RATING OF NOT LESS THAN 1 HOUR.
FIRE PARTITIONS WILL HAVE A FIRE-RESISTANCE RATING OF 1 HOUR. SEE AG001 FOR MORE INFORMATION

SECTION 708.4 CONTINUITY FOR FIRE PARTITIONS FIRE PARTITIONS SHALL EXTEND FROM THE TOP OF THE FOUNDATION OR FLOOR ASSEMBLY BELOW TO THE UNDERSIDE OF THE FLOOR OR ROOF SHEATHING, DECK, OR SLAB ABOVE OR TO THE UNDERSIDE OF FLOOR ASSEMBLY HAVING A FIRE RESISTANCE RATING THAT IS NOT LESS THAN THE FIRE RESISTANCE RATING OF THE FIRE PARTITION. THE SUPPORTING CONSTRUCTION FOR A FIRE PARTITION SHALL HAVE A FIRE RESISTANCE RATING THAT IS EQUAL TO OR GREATER THAN THE REQUIRED FIRE RESISTANCE RATING OF THE SUPPORTED FIRE PARTITION.

EXCEPTION: IN BUILDINGS OF TYPE V-B CONSTRUCTION THE SUPPORTING CONSTRUCTION REQUIREMENTS SHALL NOT APPLY TO FIRE PARTITIONS SEPARATING DWELLING UNITS. SEE SHEET AG002 FOR DETAIL OF FIRE PARTITION CONTINUITY.

PLOT DATE: 3/28/2022 3:05:17 PM

IBC 2018 ANALYSIS (CONT)

SECTION 708.4.2 FIREBLOCKS AND DRAFTSTOPS IN COMBUSTIBLE CONSTRUCTION WHERE FIRE PARTITIONS DO NOT EXTEND TO THE UNDERSIDE OF THE FLOOR OR ROOF SHEATHING, THE SPACE ABOVE AND ALONG THE LINE OF THE FIRE PARTITION SHALL BE PROVIDED WITH FIREBLOCKING OR DRAFTSTOPPING TO THE UNDERSIDE OF THE FLOOR OR ROOF SHEATHING ABOVE.

EXCEPTION (4) IN GROUP R-2 UP TO AND INCLUDING FOUR STORIES, THE ATTIC SPACE SHALL BE SUBDIVIDED BY DRAFTSTOPS INTO AREAS NOT EXCEEDING 3,000 SF OR ABOVE EVERY TWO DWELLING UNITS, WHICHEVER IS SMALLER

SEE SHEET AG001 FOR FIRE PARTITION DETAILS AT FLOOR-CEILING AND ROOF-CEILING. DRAFTSTOPPING IN THE ATTIC IS NOT REQUIRED BECAUSE THERE ARE NO AREAS EXCEEDING 3,000 SF OR LARGER THAN TWO DWELLING UNITS

SECTION 711.2.4.3 FIRE RESISTANCE RATING FOR HORIZONTAL ASSEMBLIES SEPERATING DWELLING UNITS HORIZONTAL ASSEMBLIES SERVING AS DWELLING UNIT SEPERATIONS SHALL HAVE A FIRE RESISTANCE RATING OF NOT LESS THAN 1 HOUR.

TYPICAL FLOOR / CEILING ASSEMBLY OF 1-HOUR FIRE-RESISTANCE-RATED CONSTRUCTION, REFER TO THE HORIZONTAL ASSEMBLIES DETAILS ON SHEET AG002 AND CODE SECTIONS ON SHEETS AE004 & AW004 FOR MORE INFORMATION.

SECTION 713.4 FIRE-RESISTANCE RATING FOR SHAFT ENCLOSURES SHAFT ENCLOSURES SHALL HAVE A FIRE-RESISTANCE RATING OF NOT LESS THAN 1 HOUR WHERE CONNECTING LESS THAN FOUR STORIES AND NOT LESS THAN 2 HOURS WHERE CONNECTING FOUR STORIES OR MORE.

ALL SHAFTS CONNECT 3 STORIES AND ARE RATED 1 HOUR. REFER TO THE VERTICAL ASSEMBLY DETAILS ON SHEET AG001 AND THE CODE PLANS ON SHEETS AW001, AW002, AE001 & AE002 FOR MORE INFORMATION.

IBC CHAPTER 8 – INTERIOR FINISHES

SECTION 803.13 INTERIOR FINISH REQUIREMENTS BASED ON OCCUPANCY INTERIOR WALL AND CEILING FINISHES SHALL HAVE A FLAME SPREAD INDEX NOT GREATER THAN THAT SPECIFIED IN TABLE 803.13.

IN GROUP R-2 OR S-2 OCCUPANCIES EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM FINISHES IN ALL ROOMS SHALL HAVE A FLAME SPREAD INDEX OF C OR BETTER. SEE SPECIFICATIONS FOR INFORMATION ON THE FLAME SPREAD INDEX OF INTERIOR FINISHES.

IBC CHAPTER 9 – FIRE PROTECTION SYSTEMS

SECTION 903.2 WHERE AUTOMATIC SPRINKLER SYSTEMS ARE REQUIRED AUTOMATIC SPRINKLER SYSTEMS IN NEW BUILDINGS SHALL BE PROVIDED IN GROUP R OCCUPANCIES.

BOTH BUILDINGS ARE PROTECTED BY NFPA TYPE 13R SPRINKLERS THROUGHOUT.

SECTION 903.3.1.2.1 BALCONIES AND DECKS IN GROUP R OCCUPANCIES SPRINKLER PROTECTION SHALL BE PROVIDED FOR EXTERIOR BALCONIES, DECKS, AND GROUND FLOOR PATIOS OF DWELLING UNITS AND SLEEPING UNITS WHERE THE BUILDING IS OF TYPE V CONSTRUCTION AND THERE IS A ROOF OR DECK ABOVE.

THROUGH WALL *SPRINKLER PROTECTION SHALL BE PROVIDED ON ALL BALCONIES, DECKS, AND GROUND FLOOR PATIOS.*

SECTION 906.3 SIZE AND DISTRIBUTION OF PORTABLE FIRE EXTINGUISHERS FOR A LIGHT HAZARD OCCUPANCY FIRE EXTINGUISHERS OF MINIMUM 2-A RATED SHALL BE PROVIDED WITH AN ACTUAL TRAVEL DISTANCE OF NOT MORE THAN 75 FEET TO EACH FIRE EXTINGUISHER. EACH FIRE EXTINGUISHER SHALL SERVE AN AREA OF NOT MORE THAN 3,000 SF PER UNIT A TO A MAXIMUM OF 11,250 SF.

MAXIMUM UNIT SIZE PROPOSED IS 905 SF. EACH DWELLING UNIT SHALL BE PROVIDED WITH (1) COMPLIANT FIRE EXTINGUISHER MOUNTED BELOW THE KITCHEN SINK.

SECTION 907.2 FIRE ALARM AND DETECTION SYSTEMS ARE REQUIRED AN APPROVED FIRE ALARM SYSTEM IS REQUIRED IN ALL NEW BUILDING AND STRUCTURES. WHERE OTHER SECTIONS ALLOW ELIMINATION OF FIRE ALARM BOXES, A SINGLE FIRE ALARM BOX SHALL BE INSTALLED AT A MINIMUM.

SECTION 907.2.9 GROUP R-2 A MANUAL FIRE ALARM SYSTEM THAT ACTIVATES THE OCCUPANT NOTIFICATION SYSTEM IN ACCORDANCE WITH SECTION 907.5 SHALL BE INSTALLED IN GROUP R-2 OCCUPANCIES WHERE ANY DWELLING UNIT OR SLEEPING UNIT IS LOCATED THREE OR MORE STORIES ABOVE THE LOWEST LEVEL OF EXIT DISCHARGE. SINGLE AND MULTIPLE STATION SMOKE ALARMS SHALL BE INSTALLED.

EXCEPTION: MANUAL FIRE ALARM BOXES ARE NOT REQUIRED WHERE THE BUILDING IS EQUIPPED THROUGHOUT WITH A NFPA 13 OR 13R TYPE AUTOMATIC SPRINKLER SYSTEM AND WHERE THE OCCUPANT NOTIFICATION APPLIANCES WILL AUTOMATICALLY ACTIVATE THROUGHOUT THE NOTIFICATION ZONES UPON A SPRINKLER WATERFLOW.

MANUAL FIRE ALARM BOXES WILL NOT PROVIDED BY THIS EXCEPTION.

IBC CHAPTER 10 – MEANS OF EGRESS

SECTION 1003 GENERAL GENERAL REQUIREMENTS DESCRIBED BELOW APPLY TO ALL 3 ELEMENTS OF THE MEANS OF EGRESS SYSTEM: EXIT ACCESS, EXIT, AND EXIT DISCHARGE; 90 INCHES OF CEILING HEIGHT, 80 INCHES OF HEADROOM CLEARANCE AT PROTRUSIONS, PROTRUDING OBJECTS NOT GREATER THAN 4 INCHES INTO THE WIDTH OF THE EGRESS ROUTE, SLIP-RESISTANT SURFACES, CONTINUOUS AND UNOBSTRUCTED BY ANY BUILDING ELEMENT EXCEPT THOSE THAT ARE A PART OF THE MEANS OF EGRESS.

SECTION 1004 OCCUPANT LOAD NUMBER OF OCCUPANTS CALCULATED PER LOAD FACTORS PROVIDED IN TABLE 1004.1.2.

OCCUPANT LOAD SUMMARY
RESIDENTIAL: 200 SF / OCCUPANT
ACCESSORY AREAS: 300 SF / OCCUPANT

	WEST BUILDING	EAST BUILDING
LEVEL ONE OCCUPANTS:	17	17
LEVEL TWO OCCUPANTS:	17	17
LEVEL THREE OCCUPANTS:	10	10
PROJECT TOTAL OCCUPANTS : 88	44	44

REFER TO CODE PLANS ON SHEET AW001, AW002, AE001 & AE002 FOR SPECIFIC BREAKDOWN OF OCCUPANTS.

SECTION 1005 MEANS OF EGRESS SIZING IN A BUILDING EQUIPPED THROUGHOUT WITH AN AUTOMATIC FIRE SPRINKLER SYSTEM AND AN EMERGENCY VOICE/ALARM COMMUNICATION SYSTEM, EACH COMPONENT OF THE MEANS OF EGRESS SHALL NOT HAVE A CLEAR WIDTH SMALLER THAN 0.2 INCHES PER OCCUPANT AT STAIRS AND 0.15 INCHES PER OCCUPANT ELSEWHERE OR THE MINIMUM SPECIFIED FOR THAT COMPONENT ELSEWHERE IN THE CODE, WHICHEVER IS GREATER.

A STAIR AT ITS MINIMUM WIDTH OF 44" CAN SERVE UP TO 220 EXITING OCCUPANTS. NONE OF THE STAIRS IN THE PROJECT SERVE MORE THAN THIS AMOUNT. DOORS AT THEIR MINIMUM CLEAR OPENING OF 32" CAN SERVE UP TO 213 OCCUPANTS. NONE OF THE DOORS IN THE PROJECT SERVE MORE THAN THIS AMOUNT. REFER TO CODE PLANS ON SHEETS AW001, AW002, AE001 & AE002 FOR SPECIFIC BREAKDOWN OF OCCUPANTS AND EXITING PATHS.

SECTION 1006 NUMBER OF EXITS AND EXIT ACCESS DOORWAYS TWO EXITS OR EXIT ACCESS DOORWAYS FROM ANY SPACE SHALL BE PROVIDED WHERE THE DESIGN OCCUPANT LOAD OR COMMON PATH OF EGRESS DISTANCE EXCEEDS: GROUP R-2: 20 OCCUPANTS OR 125 FEET

MAXIMUM NUMBER OF OCCUPANTS IN ANY SINGLE UNIT DOES NOT EXCEED 20. MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE DOES NOT EXCEED 125'. THEREFORE ONLY ONE EXIT IS REQUIRED FROM EACH UNIT. REFER TO CODE PLANS ON SHEETS AW001, AW002, AE001 & AE002 FOR MORE INFORMATION.

SECTION 1006.3.3 SINGLE EXITS A SINGLE EXIT OR ACCESS TO A SINGLE EXIT SHALL BE PERMITTED FROM ANY STORY OR OCCUPIED ROOF WHERE ONE OF THE FOLLOWING CONDITIONS EXIST: (1.) THE OCCUPANT LOAD, NUMBER OF DWELLING UNITS AND COMMON PATH OF EGRESS TRAVEL DISTANCE DO NOT EXCEED THE VALUES LISTED IN TABLE 1006.3.3. GROUP R-2: MAXIMUM 4 DWELLING UNITS & MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE OF 125'.

MAXIMUM NUMBER OF DWELLING UNITS PER STORY DOES NOT EXCEED 4. MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE DOES NOT EXCEED 125'. THEREFORE ONLY ONE EXIT IS REQUIRED FROM EACH UNIT. REFER TO CODE PLANS ON SHEETS AW001, AW002, AE001 & AE002 FOR MORE INFORMATION.

IBC 2018 ANALYSIS (CONT)

SECTION 1008 MEANS OF EGRESS ILLUMINATION PATH(S) OF EGRESS SHALL BE ILLUMINATED BY 1 FOOT CANDLE AT ALL TIMES.

REFER TO CODE PLANS ON SHEETS AW001, AW002, AE001 & AE002 FOR EXIT SIGN LOCATIONS AND REFER TO ELECTRICAL PLANS FOR LIGHTING ON EMERGENCY (90 MIN) POWER.

SECTION 1009 ACCESSIBLE MEANS OF EGRESS ACCESSIBLE SPACES SHALL BE PROVIDED WITH AT LEAST ONE ACCESSIBLE MEANS OF EGRESS. WHERE MORE THAN ONE MEANS OF EGRESS IS REQUIRED FROM AN ACCESSIBLE SPACE BY SECTION 1006, EACH ACCESSIBLE SPACE SHALL BE SERVED BY NOT LESS THAN TWO ACCESSIBLE MEANS OF EGRESS.

ALL ACCESSIBLE SPACES ARE PROVIDED WITH AN ACCESSIBLE MEANS OF EGRESS. ONLY ONE MEANS OF EGRESS IS REQURIED FROM EACH UNIT.

SECTION 1009.3 STAIRWAYS TO BE CONSIDERED PART OF AN ACCESSIBLE MEANS OF EGRESS, STAIRWAYS SHALL HAVE A MINIMUM CLEAR WIDTH OF 48 INCHES BETWEEN HAND RAILS AND INCORPORATE AN AREA OF REFUGE.

EXCEPTION: THE CLEAR WIDTH OF 48 INCHES BETWEEN HANDRAILS AND THE AREA OF REFUGE ARE NOT REQUIRED IN BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM.

AREAS OF REFUGE ARE NOT PROVIDED PER THIS EXCEPTION

SECTION 1010.1.1 SIZE OF DOORS THE REQUIRED CAPACITY OF EACH DOOR OPENING SHALL BE SUFFICIENT FOR THE OCCUPANT LOAD THEREOF AND SHALL PROVIDE A MINIMUM CLEAR OPENING WIDTH OF 32".

MINIMUM SIZE OF ALL DOORS IN THE REQUIRED PATHS OF EGRESS IS 32" . . SEE CODE PLANS FOR MORE INFORMATION.

SECTION 1011.2 STAIRWAY WIDTH AND CAPACITY THE REQUIRED CAPACITY OF STAIRWAYS SHALL BE DETERMINED AS SPECIFIED IN SECTION 1005.1, BUT THE MINIMUM WIDTH SHALL NOT BE LESS THAN 44 INCHES.

EXCEPTION: STAIRWAYS SERVING AN OCCUPANT LOAD OF LESS THAN 50 SHALL HAVE A WIDTH OF NOT LESS THAN 36 INCHES.

MINIMUM SIZE OF ALL STAIRWAYS PROVIDED IS 44". SEE CODE PLANS FOR MORE INFORMATION.

SECTION 1017 EXIT ACCESS TRAVEL DISTANCE EXIT ACCESS TRAVEL DISTANCE SHALL NOT EXCEED THE VALUES GIVEN IN TABLE 1017.2 (250 FEET FOR GROUP R OCCUPANCY WITH AN AUTOMATIC FIRE SPRINKLER SYSTEM.

REFER TO CODE PLANS ON SHEETS AW001, AW002, AE001 & AE002 FOR EXIT ACCESS TRAVEL DISTANCE CALCULATIONS.

SECTION 1023 INTERIOR EXIT STAIRWAYS AND RAMPS INTERIOR EXIT STAIRWAYS SHALL HAVE A FIRE-RESISTANCE RATING OF NOT LESS THAN 2 HOURS WHERE CONNECTING FOUR STORIES OR MORE AND NOT LESS THAN 1 HOUR WHERE CONNECTING THREE STORIES OR LESS.

ALL INTERIOR EXIT STAIRWAYS CONNECT 3 STORIES AND ARE 1 HOUR RATED. REFER TO CODE PLANS ON SHEETS AW001, AW002, AE001 & AE002 FOR ADDITIONAL INFORMATION

SECTION 1030.1 EMERGENCY ESCAPE AND RESCUE IN ADDITION TO THE MEANS OF EGRESS REQUIRED BY THIS CHAPTER, EMERGENCY ESCAPE AND RESCUE OPENINGS SHALL BE PROVIDED IN GROUP R-2 OCCUPANCIES LOCATED IN STORIES WITH ONLY ONE EXIT OR ACCESS TO ONLY ONE EXIT. EMERGENCY ESCAPE AND RESCUE OPENINGS SHALL HAVE A MINIMUM NET CLEAR OPENING OF 5.7 SQUARE FEET. THE MINIMUM NET CLEAR OPENING HEIGHT DIMENSION SHALL BE 24" AND THE MINIMUM NET CLEAR OPENING WIDTH DIMENSION SHALL BE 20". EMERGENCY ESCAPE AND RESCUE OPENINGS SHALL HAVE THE BOTTOM OF THE CLEAR OPENING NOT GREATER THAN 44" MEASURED FROM THE FLOOR.

EGRESS WINDOWS ARE PROVIDED IN ALL SLEEPING ROOMS, REFER TO SHEETS AW001, AW002, AE001 & AE002 FOR ELEVATIONS DEMONSTRATING WHICH WINDOWS ARE DESIGNATED AS EGRESS WINDOWS

IBC CHAPTER 11 – ACCESSIBILITY

SECTION 1103 SCOPING REQUIREMENTS SITES, BUILDINGS, STRUCTURES, FACILITIES, ELEMENTS AND SPACES, TEMPORARY OR PERMANENT, SHALL BE ACCESSIBLE.

REFER TO SHEET G0.61-G0.62 FOR GENERAL ACCESSIBILITY DETAILS

SECTION 1104 ACCESSIBLE ROUTE ACCESSIBLE ROUTES SHALL BE PROVIDED FROM PUBLIC TRANSPORTATION, ACCESSIBLE PARKING AND LOADING ZONES, AND PUBLIC STREETS AND SIDEWALKS CONNECTING TO ALL ACCESSIBLE BUILDINGS, FACILITIES, ELEMENTS, AND SPACES WITHIN THE SITE.

REFER TO SITE PLAN ON SHEET A1.00 FOR LOCATION OF ACCESSIBLE ROUTE

SECTION 1107.6.2.2.1 TYPE A UNITS IN GROUP R-2 OCCUPANCIES CONTAINING MORE THAN 20 DWELLING UNITS OR SLEEPING UNITS, AT LEAST 2 PERCENT BUT NOT LESS THAN 1 SHALL BE A TYPE A UNIT. ALL GROUP R-2 UNITS ON A SITE SHALL BE CONSIDERED TO DETERMINE THE TOTAL NUMBER OF REQUIRED TYPE A UNITS.

THE TOTAL NUMBER OF GROUP R-2 UNITS ON SITE IS 22, THEREFORE 1 TYPE A UNIT IS REQUIRED. UNIT W103 IS DESIGNED TO MEET TYPE A STANDARDS. SEE THE UNIT PLANS FOR MORE DETAIL.

SECTION 1107.6.2.2.2 TYPE B UNITS WHERE THERE ARE FOUR OR MORE DWELLING UNITS OR SLEEPING UNITS INTENDED TO BE OCCUPIED AS A RESIDENCE EVERY DWELLING UNIT AND SLEEPING UNIT INTENDED TO BE OCCUPIED AS A RESIDENCE SHALL BE A TYPE B UNIT.

PER THE EXCEPTION, THE NUMBER OF TYPE B UNITS IS PERMITTED TO BE REDUCED IN ACCORDANCE WITH SECTION 1107.7

SECTION 1107.7.1 STRUCTURES WITHOUT ELEVATOR SERVICE WHERE ELEVATOR SERVICE IS NOT PROVIDED IN A STRUCTURE, ONLY THE DWELLING UNITS AND SLEEPING UNITS THAT ARE LOCATED ON STORIES INDICATED IN SECTIONS 1107.1.1 AND 1107.1.2 ARE REQUIRED TO BE TYPE A UNITS AND TYPE B UNITS, RESPECTIVELY.

NO ELEVATORS ARE PROVIDED IN THIS PROJECT, THEREFORE ONLY THE UNITS ON THE GROUND FLOOR ARE REQUIRED TO BE ACCESSIBLE.

SECTION 1107.7.1.1 ONE STORY WITH TYPE B UNITS REQUIRED AT LEAST ONE STORY CONTAINING DWELLING UNITS OR SLEEPING UNITS INTENDED TO BE OCCUPIED AS RESIDENCE SHALL BE PROVIDED WITH AN ACCESSIBLE ENTRANCE FROM THE EXTERIOR OF THE STRUCTURE AND ALL UNITS INTENDED TO BE OCCUPIED AS A RESIDENCE ON THAT STORY SHALL BE TYPE B UNITS.

ALL UNITS ON THE GROUND FLOOR ARE ATLEAST TYPE B ACCESSIBLE, WITH UNIT W103 BEING TYPE A ACCESSIBLE.

IBC CHAPTER 12 - INTERIOR ENVIRONMENT

SECTION 1202.3 UNVENTED ATTIC AND UNVENTED ENCLOSED RAFTER ASSEMBLIES UNVENTED ATTICS AND UNVENTED ENCLOSED ROOF FRAMING ASSEMBLIES CREATED BY CEILINGS APPLIED DIRECTLY TO THE UNDERSIDE OF THE ROOF FRAMING MEMBERS/RAFTERS AND THE STRUCTURAL ROOF SHEATHING AT THE TOP OF THE ROOF FRAMING MEMBERS ARE PERMITTED BECAUSE ALL OF THE FOLLOWING ARE PROVIDED:

1. THE UNVENTED ATTIC SPACE IS COMPLETELY WITHIN THE BUILDING ENVELOPE
2. NO INTERIOR CLASS 1 VAPOR RETARDERS ARE INSTALLED ON THE CEILING SIDE
3. NO WOOD SHINGLES ARE USED
4. THE AIR-IMPERMEABLE INSULATION IS A CLASS II VAPOR RETARDER
5. BOTH AIR-IMPERMEABLE AND AIR-PERMEABLE INSULATION IS PROVIDED, AND THE AIR-IMPERMEABLE INSULATINO IS APPLIED IN DIRECT CONTACT WITH THE UNDERSIDE OF THE STRUCTURAL ROOF SHEATHING AND HAS AN R-VALUE EXCEEDING THE MINIMUM R-30 FOR CLIMATE ZONE 7 PER TABLE 1202.3. THE AIR-PERMEABLE INSULATION IS INSTALLED DIRECTLY UNDER THE AIR-IMPERMEABLE INSULATION.

SECTION 1208 ACCESS TO UNOCCUPIED SPACES AN OPENING NOT LESS THAN 20 INCHES BY 30 INCHES IS REQUIRED TO THE ATTIC AREA BECAUSE IT HAS A CLEAR HEIGHT OF OVER 30 INCHES. CLEAR HEADROOM OF NOT LESS THAN 30 INCHES IS REQUIRED IN THE ATTIC SPACE AT OR ABOVE THE ACCESS OPENING.

ATTIC ACCESS IS PROVIDED AT EACH INTERIOR EXIT STAIR. SEE CODE FLOOR PLANS AND CODE SECTIONS FOR MORE INFORMATION

IBC CHAPTER 29 - PLUMBING SYSTEMS

SECTION 2902 MINIMUM PLUMBING FACILITIES A MINIMUM NUMBER OF PLUMBING FIXTURES SHALL BE PROVIDED IN ACCORDANCE WITH TABLE 2902.1.

MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES SUMMARY

APARTMENT HOUSE	REQUIRED	PROVIDED: (WEST BLDG)	(EAST BLDG)
WATER CLOSET	1 PER UNIT	≥ 1 PER UNIT	≥ 1 PER UNIT
LAVATORY	1 PER UNIT	≥ 1 PER UNIT	≥ 1 PER UNIT
BATHTUB/SHOWER	1 PER UNIT	≥ 1 PER UNIT	≥ 1 PER UNIT
KITCHEN SINK	1 PER UNIT	1 PER UNIT	1 PER UNIT
CLOTHES WASHER CONNECTION	1 PER 20 UNITS	1 PER UNIT	1 PER UNIT

CODE ANALYSIS - CARPORT

BUILDING DATA:

OCCUPANCY GROUP:	U
TYPE OF CONSTRUCTION:	II-B
BUILDING HEIGHT:	1 STORY / 13'-8"
FIRE PROTECTION:	NONE
BUILDING SQUARE FOOTAGE (IBC)	5,783 SF
TOTAL OCCUPANTS:	NONE

APPLICABLE CODES: BUILDING - IBC 2018*
PLUMBING - IPC 2018*
MECHANICAL - IMC 2018*
ELECTRICAL - NEC 2020*
FIRE - IFC 2018*
ACCESSIBILITY - ANSI A117.1 - 2009

(*) STANDARDS ADOPTED AS AMENDED BY THE TOWN OF FRISCO ON 04/14/2020

IBC 2018 ANALYSIS

IBC CHAPTER 3 – USE AND OCCUPANCY CLASSIFICATION

OCCUPANCY CLASSIFICATION: THE PROJECT IS A ULITITY AND MISCELLANEOUS GROUP U CLASSIFICATION.

IBC CHAPTER 5 – GENERAL BUILDING HEIGHTS AND AREAS

SECTION 504 BUILDING HEIGHT AND NUMBER OF STORIES BUILDINGS OF TYPE II-B WITHOUT A SPRINKLER SYSTEM HAVE THE FOLLOWING TABULAR BUILDING HEIGHT AND NUMBER OF STORY LIMITATIONS:

GROUP	HEIGHT (ALLOWED / ACTUAL)	STORIES (ALLOWED / ACTUAL)
U	55'-0" / 13'-8"	2 / 1

SECTION 506 BUILDING AREA BUILDINGS OF TYPE II-B WITHOUT A SPRINKLER SYSTEM HAVE THE FOLLOWING TABULAR BUILDING AREA LIMITATIONS. AREA FACTOR INCREASE BASED ON FRONTAGE NOT NEEDED AND NOT INCLUDED.

GROUP	LEVEL	AREA (ALLOWED)	AREA (ACTUAL)
U	1	8,500 GSF	5,783 GSF

* AREA CALCULATION BASED ON HORIZONTAL PROJECTION OF THE ROOF ABOVE PER CHAPTER 2, "AREA, BUILDING" - AREAS OF THE BUILDING NOT PROVIDED WITH SURROUNDING WALLS SHALL BE INCLUDED IN THE BUILDING AREA IF SUCH AREAS ARE INCLUDED WITHIN THE HORZONTAL PROJECTION OF THE ROOF OR FLOOR ABOVE.

CHAPTER 6 - TYPES OF CONSTRUCTION

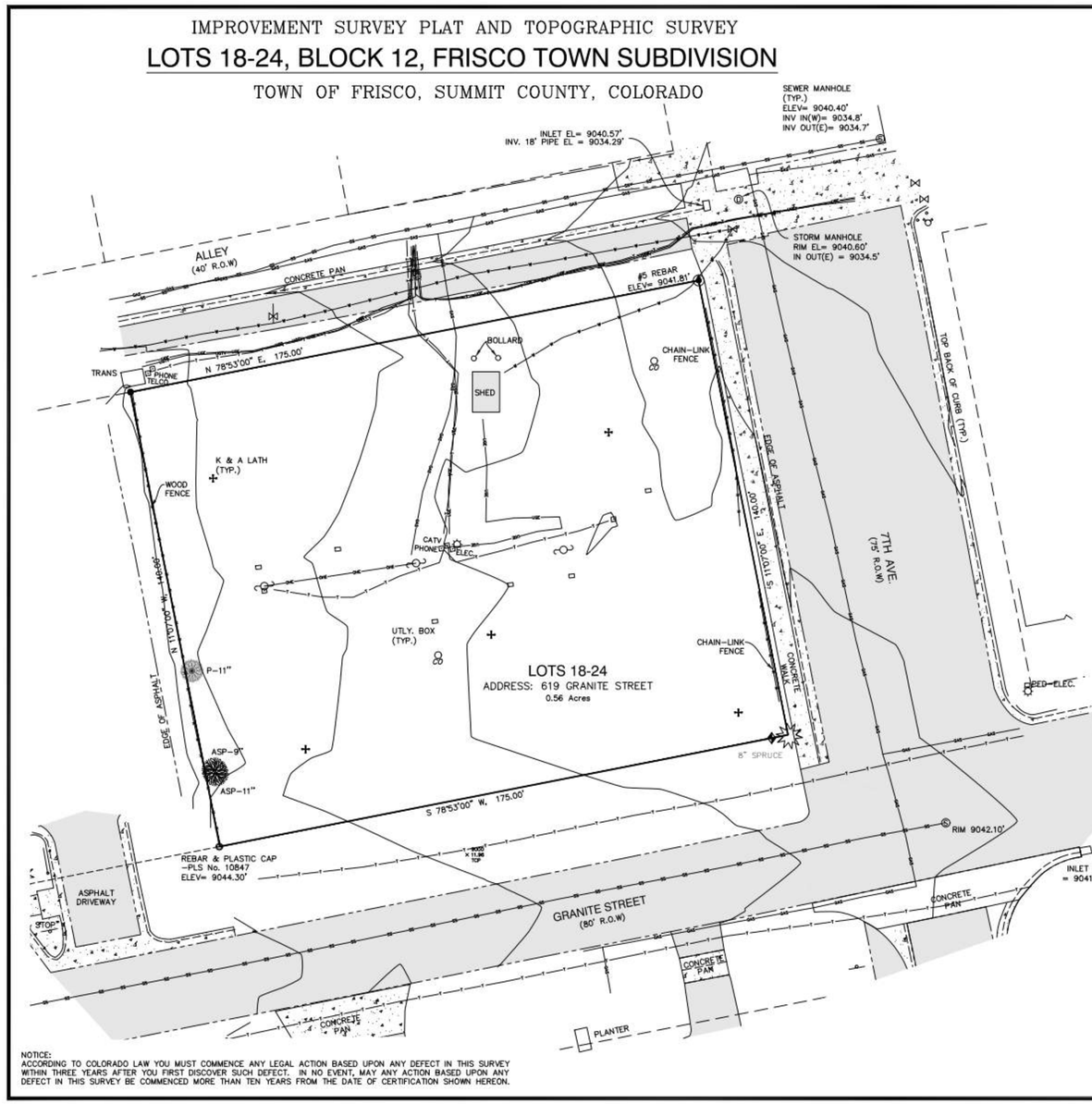
CONSTRUCTION CLASSIFICATION: TYPE V-B

FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS) PER TABLE 601:
PRIMARY STRUCTURAL FRAME: 0
BEARING

IMPROVEMENT SURVEY PLAT AND TOPOGRAPHIC SURVEY

LOTS 18-24, BLOCK 12, FRISCO TOWN SUBDIVISION

TOWN OF FRISCO, SUMMIT COUNTY, COLORADO



NOTICE:
ACCORDING TO COLORADO LAW YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT, MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF CERTIFICATION SHOWN HEREON.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

LEGEND

●	FOUND #5 REBAR
○	FOUND REBAR & PLASTIC CAP –PLS No. 10847
●	SET REBAR & PLASTIC CAP –PLS No. 37047
◆	SET REBAR & ALUM. CAP –PLS No. 37047 (5.0' WITNESS CORNER)
⋈	WATER VALVE
Ⓓ	STORM SEWER MANHOLE
Ⓢ	SEWER MANHOLE
	SEWER CLEANOUT
	UTILITY POLE
	UTILITY PEDESTAL
	SIGN
3"	ASPEN TREE WITH TRUNK DIAMETER
3"	SPRUCE TREE WITH TRUNK DIAMETER
3"	PINE TREE WITH TRUNK DIAMETER
	K & A LATH
W W	WATER LINE
UGTV	UNDER GROUND CATV
UGE	UNDERGROUND ELECTRIC
T T	UNDERGROUND TELCO.
GAS	UNDERGROUND GAS
SS SS	SANITARY SEWER
OHE	OVERHEAD ELECTRIC LINE

GENERAL NOTES

1 DATE OF SURVEY: NOVEMBER 3 & 5, 2020.

2 CONTOUR INTERVAL = ONE FOOT.

3 ELEVATIONS BASED ON NGS MONUMENT W449 NEAR INTERSECTION OF STATE HIGHWAY NO. 9 AND INTERSTATE 70. NAVD 88 ELEVATION 9058.09 FEET.

4 BASIS OF BEARINGS: THE SOUTHWEST AND NORTHEAST PROPERTY CORNER OF LOTS 18-24, BLOCK 12, FRISCO TOWN SUBDIVISION.

5 SCHMIDT LAND SURVEYING, INC. DID NOT PERFORM A TITLE SEARCH OF THE SUBJECT PROPERTY TO ESTABLISH OWNERSHIP, EASEMENTS OR RIGHTS-OF-WAY OF RECORD.

Drawn EKS/TMB	Dwg 2462 TP.dwg	Project 2462
Date 11/20/20	Scale 1" = 20'	Sheet 1 of 1

SCHMIDT
LAND SURVEYING, INC.
P.O. Box 5761
FRISCO, CO 80443 970-409-9963

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

IMPROVEMENT SURVEY PLAT & TOPO INFO

1 OF 1

PLOT DATE: 3/28/2022 3:01:18 PM

COPYRIGHT©

ABBREVIATIONS

AASHTO	AMERICAN ASSOC. OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
ABAN	ABANDON
AC	ASPHALTIC CONCRETE PAVING
ADDL	ADDITIONAL
ADDM	ADDENDUM
ADJ	ADJUSTABLE
AL	ALUMINUM
ALT	ALTERNATE
AMT	AMOUNT
APPROX	APPROXIMATE
ARCH	ARCHITECT(URAL)
ARV	AIR RELIEF VALVE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
ASPH	ASPHALT
ASSY	ASSEMBLY
ASYM	ASYMMETRICAL
AUTO	AUTOMATIC
AVG	AVERAGE
AWWA	AMERICAN WATER WORKS ASSOC.
BC	BACK OF CURB
BFV	BUTTERFLY VALVE
BG	FINISHED GRADE ADJACENT TO BOTTOM OF WALL
BLDG	BUILDING
BLK	BLOCK
BM	BENCH MARK
BMP	BEST MANAGEMENT PRACTICE
BS	BACKSIGHT
BOS	BOTTOM OF STEP
BOT	BOTTOM
BSMT	BASEMENT
BVCE	BEGIN VERTICAL CURVE ELEVATION
BVCS	BEGIN VERTICAL CURVE STATION
BW	BOTTOM OF WALL
CB	CATCH BASIN
CCW	COUNTER CLOCKWISE
CDOT	COLORADO DEPARTMENT OF TRANSPORTATION
CIP	CAST IRON PIPE
CJ	CONSTRUCTION JOINT
CL	CENTER LINE OR CHAIN LINK
CLR	CLEAR
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CO	CLEANOUT
CONC	CONCRETE
CONST	CONSTRUCTION
CONT	CONTINUOUS(ATION)
COR	CORNER
CR	CONCENTRIC REDUCER
CTR	CENTER
CY	CUBIC YARDS
DEMO	DEMOLITION
DIA	DIAMETER
DIAG	DIAGONAL
DIP	DUCTILE IRON PIPE
DOM	DOMESTIC
DN	DOWN
DR	DRAIN
DWG	DRAWING
DWL	DOWEL
E	EAST
EA	EACH
ECC	ECCENTRIC
EJ	EXPANSION JT
EL	ELEVATION
ELB	ELBOW
ELEC	ELECTRICAL
ENGR	ENGINEER
EOP	EDGE OF PAVEMENT
EQ	EQUAL
EQUIP	EQUIPMENT
EQUIV	EQUIVALENT
ESMT	EASEMENT
EST	ESTIMATE
EVCE	END VERTICAL CURVE ELEVATION
EVCS	END VERTICAL CURVE STATION
EW	EACH WAY
EXP JT	EXPANSION JOINT
EXIST	EXISTING
FND	FOUNDATION
FES	FLARED END SECTION
FF	FINISH FLOOR
FG	FINISH GRADE
FH	FIRE HYDRANT
FL	FLOW LINE
FN	FENCE
FOC	FACE OF CONCRETE
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FT	FEET
FTG	FOOTING OR FITTING
G	GAS
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GCO	GRADE CLEANOUT
GIP	GALVANIZED IRON PIPE
GND	GROUND
GPD	GALLONS PER DAY
GPM	GALLONS PER MINUTE
GR	GRATE
GRTG	GRATING
GSP	GALVANIZED STEEL PIPE
GV	GATE VALVE
H	HIGH
HB	HOSE BIB
HC	HORIZONTAL ELLIPTICAL
HDWL	HEADWALL
HNDRL	HAND RAIL
HORIZ	HORIZONTAL
HP	HIGH POINT
HR	HOUR
HVAC	HEATING, VENTILATION, AIR CONDITIONING
HWY	HIGHWAY
HWL	HIGH WATER LINE
HYD	HYDRANT
INCL	INCLUDED
ID	INSIDE DIAMETER
IN	INLET
INSUL	INSULATION
INV	INVERT
IRR	IRRIGATION
JTS	JOINTS
KO	KNOCKOUT
KPL	KICK PLATE
KWY	KEYWAY
L	LEFT OR LITER
LSCAPE	LANDSCAPE(ING)
LF	LINEAR FOOT
LP	LOW POINT
LT	LIGHT
LWL	LOW WATER LEVEL
MAINT	MAINTENANCE
MAN	MANUAL
MATL	MATERIAL
MAX	MAXIMUM
ME	MATCH EXISTING
MECH	MECHANICAL
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
N	NORTH
NA	NOT APPLICABLE
NIC	NOT IN CONTRACT
NPT	NATIONAL PIPE THREAD
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OPP	OPPOSITE
OPT	OPTIONAL
PC	POINT OF CURVATURE
PCO	PRESSURE CLEAN OUT
PCR	POINT OF CURVE RETURN
PI	POINT OF INTERSECTION
PVI	POINT OF VERTICAL INTERSECTION
PL	PROPERTY LINE
PE	POLYETHYLENE
PREFAB	PREFABRICATED
PRELIM	PRELIMINARY
PREP	PREPARATION
PROP	PROPOSED
PRV	PRESSURE REDUCING VALVE OR PRESSURE RELIEF VALVE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	POINT OF TANGENCY
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE OR POINT OF VERTICAL CURVATURE
PVMT	PAVEMENT
QTY	QUANTITY
R	RIGHT
RAD	RADIUS
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
RE	REFERENCE
RECT	RECTANGULAR
REINF	REINFORCE (D) (ING) (MENT)
REQD	REQUIRED
ROW	RIGHT OF WAY
SAN	SANITARY
SD	STORM DRAIN
SECT	SECTION
SPD	STANDARD PROCTOR DENSITY
SPEC	SPECIFICATION
SQ	SQUARE
SQ IN	SQUARE INCH
SQ FT	SQUARE FOOT
SQ YD	SQUARE YARD
SS	SANITARY SEWER
SST	STAINLESS STEEL
STA	STATION
STD	STANDARD
STL	STEEL
STRUCT	STRUCTURAL
SVC	SERVICE
SWMP	STORMWATER MANAGEMENT PLAN
SYM	SYMMETRICAL
TB	THRUST BLOCK
TBC	TOP BACK OF CURB
TBM	TEMPORARY BENCH MARK
TEMP	TEMPORARY
TG	FINISHED GRADE ADJACENT TO TOP OF WALL
THK	THICK
TOB	TOP OF BANK
TOC	TOP OF CONCRETE OR TOP OF CURB
TOS	TOP OF STEP
TOT	TOTAL
TW	TOP OF WALL OR CAP OF WALL
TYP	TYPICAL
UBC	UNIFORM BUILDING CODE
UGE	UNDERGROUND ELECTRIC
UTIL	UTILITY
VERT	VERTICAL
VC	POINT OF VERTICAL CURVATURE
VCP	VITRIFIED CLAY PIPE
W	WIDE OR WIDTH
W/	WITH
W/O	WITHOUT
WQCE	WATER QUALITY CONTROL ELEVATION
WSE	WATER SURFACE ELEVATION
WW	WASTEWATER
X SECT	CROSS SECTION
XFMR	ELECTRONIC TRANSFORMER
YH	YARD HYDRANT

DESIGN LEGEND

- BENCHMARK
- MANHOLE
- AREA DRAIN
- COMBINATION INLET
- TYPE R INLET
- TYPE 13 FIELD INLET
- FLARED END SECTION W/ RIPRAP
- TEE W/ THRUST BLOCK
- BEND W/ THRUST BLOCK
- END CAP W/ THRUST BLOCK
- GATE VALVE
- REDUCER/INCREASER
- WATER METER
- FIRE HYDRANT
- SD — STORM – 12" AND SMALLER
- STORM – LARGER THAN 12"
- RD — ROOF DRAIN
- TD — TRENCH DRAIN
- UD — UNDERDRAIN
- SS — SANITARY SEWER
- FM — FORCE MAIN
- W — WATER
- NPW — NON POTABLE WATER
- PW — POTABLE WATER
- IRR — IRRIGATION
- IRRIGATION – LARGER THAN 12"
- CATV — CABLE TV
- D — DRAIN
- E — ELECTRIC
- UE — UNDERGROUND ELECTRIC
- OE — OVERHEAD ELECTRIC
- T — TELEPHONE
- FO — FIBER OPTIC
- FUEL — FUEL
- G — GAS
- PVC — PVC PIPE (MISC)

DETAIL TITLE

DETAIL TITLE
SCALE

1 / –

- DETAIL NUMBER IDENTIFICATION
- SHEET WHERE THE SECTION OR ELEVATION IS CUT OR CALLED OUT – INDICATES SAME DRAWING

1 / C1.0

- DETAIL NUMBER IDENTIFICATION
- SHEET WHERE THE DETAIL IS DRAWN – INDICATES SAME DRAWING

- FENCE
- FLOW LINE OF DITCH OR WASH
- 5.0% — SLOPE ARROW
- +03.54 — PROPOSED SPOT ELEVATION
- +03.3 — EXIST SPOT ELEVATION
- 5220 — EXIST INDEX CONTOUR
- 5221 — EXIST INTERMEDIATE CONTOUR
- 20 — PROPOSED INDEX CONTOUR
- 21 — PROPOSED INTERMEDIATE CONTOUR
- CURB AND GUTTER
- SPILL/CATCH CURB TRANSITION
- SIGN W/ POST
- CURB RAMP
- SIDEWALK CHASE
- SIDEWALK
- CONCRETE PAVING
- HEAVY DUTY CONCRETE PAVING
- HEAVY DUTY ASPHALT PAVING
- LIGHT DUTY ASPHALT PAVING
- GRAVEL
- PROPOSED BUILDING
- BUILDING ACCESS
- RETAINING WALL
- BOULDER/ROCK WALL
- LIMITS OF SAWCUT
- LIMITS OF WORK
- EASEMENT LINE
- PROPERTY LINE
- ADJACENT PROPERTY LINE/ROW
- MATCHLINE

811 Know what's below. Call before you dig.

SECTION CALLOUT

A / –

- SECTION NUMBER IDENTIFICATION
- SHEET WHERE THE SECTION IS – INDICATES SAME DRAWING

DETAIL MARKER

1 / 1

- REVISION CLOUD
- REVISION NUMBER

GENERAL NOTES

1. ALL MATERIALS AND WORKMANSHIP SHALL BE IN CONFORMANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF THE TOWN OF FRISCO, UTILITY DISTRICTS, COLORADO DEPARTMENT OF TRANSPORTATION, LAKE DILLON FIRE PROTECTION DISTRICT REQUIREMENTS, AND APPLICABLE STATE AND LOCAL STANDARDS AND SPECIFICATIONS. THE CONTRACTOR SHALL HAVE IN POSSESSION AT THE JOB SITE AT ALL TIMES ONE (1) SIGNED COPY OF APPROVED PLANS, STANDARDS AND SPECIFICATIONS. CONTRACTOR SHALL CONSTRUCT AND MAINTAIN EMERGENCY ACCESS ROUTES TO THE SITE AND STRUCTURE AT ALL TIMES PER THE APPLICABLE LAKE DILLON FIRE PROTECTION DISTRICT REQUIREMENTS. THE CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL FOR ANY VARIANCE TO THE ABOVE DOCUMENTS. NOTIFY ENGINEER OF ANY CONFLICTING STANDARDS OR SPECIFICATIONS. IN THE EVENT OF ANY CONFLICTING STANDARD OR SPECIFICATION, THE MORE STRINGENT OR HIGHER QUALITY STANDARD, DETAIL OR SPECIFICATION SHALL APPLY.
2. THE CONTRACTOR SHALL OBTAIN, AT HIS OWN EXPENSE, ALL APPLICABLE CODES, LICENSES, STANDARD SPECIFICATIONS, PERMITS, BONDS, ETC., WHICH ARE NECESSARY TO PERFORM THE PROPOSED WORK, INCLUDING, BUT NOT LIMITED TO A LOCAL AND STATE GROUNDWATER DISCHARGE AND COLORADO DEPARTMENT OF HEALTH AND ENVIRONMENT (CDPHE) STORMWATER DISCHARGE PERMIT ASSOCIATED WITH CONSTRUCTION ACTIVITY.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE REQUIRED PARTY (OWNER, OWNER'S REPRESENTATIVE, MUNICIPAL/DISTRICT INSPECTOR, GEOTECHNICAL ENGINEER, ENGINEER AND/OR UTILITY OWNER) AT LEAST 48 HOURS PRIOR TO START OF ANY CONSTRUCTION, PRIOR TO BACKFILLING, AND AS REQUIRED BY JURISDICTIONAL AUTHORITY AND/OR PROJECT SPECIFICATIONS. THE CONTRACTOR SHALL CONTINUE WITH NOTIFICATIONS THROUGHOUT THE PROJECT AS REQUIRED BY THE STANDARDS AND SPECIFICATIONS.
4. THE LOCATIONS OF EXISTING UTILITIES ARE SHOWN IN THE APPROXIMATE LOCATION BASED ON INFORMATION BY OTHERS. NOT ALL UTILITIES MAY BE SHOWN. THE CONTRACTOR SHALL DETERMINE THE EXACT SIZE, LOCATION AND TYPE OF ALL EXISTING UTILITIES WHETHER SHOWN OR NOT BEFORE COMMENCING WORK. THE ENGINEER AND/OR OWNER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS SHOWN ON PLANS. THE CONTRACTOR SHALL BE FULLY AND SOLELY RESPONSIBLE FOR ANY AND ALL DAMAGES AND COSTS WHICH MIGHT OCCUR BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES. THE CONTRACTOR SHALL NOTIFY ALL PUBLIC AND PRIVATE UTILITY COMPANIES AND DETERMINE THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO PROCEEDING WITH GRADING AND CONSTRUCTION. ALL WORK PERFORMED IN THE AREA OF UTILITIES SHALL BE PERFORMED AND INSPECTED ACCORDING TO THE REQUIREMENTS OF THE UTILITY OWNER. LIKEWISE, THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND MAPPING ANY EXISTING UTILITY (INCLUDING DEPTH) WHICH MAY CONFLICT WITH THE PROPOSED CONSTRUCTION, AND FOR RELOCATING ENCOUNTERED UTILITIES AS DIRECTED BY THE ENGINEER. CONTRACTOR SHALL CONTACT AND RECEIVE APPROVAL FROM MUNICIPALITY/UTILITY OWNER AND ENGINEER BEFORE RELOCATING ANY ENCOUNTERED UTILITIES. CONTRACTOR RESPONSIBLE FOR SERVICE CONNECTIONS, AND RELOCATING AND RECONNECTING AFFECTED UTILITIES AS COORDINATED WITH UTILITY OWNER AND/OR ENGINEER, INCLUDING NON–MUNICIPAL UTILITIES (TELEPHONE, GAS, CABLE, ETC., WHICH SHALL BE COORDINATED WITH THE UTILITY OWNER). THE CONTRACTOR SHALL IMMEDIATELY CONTACT ENGINEER UPON DISCOVERY OF A UTILITY DISCREPANCY OR CONFLICT. AT LEAST 48 HOURS PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE UTILITY NOTIFICATION CENTER OF COLORADO (1–800–922–1987, WWW.UNCC.ORG). SEE SURVEY UTILITY LOCATION INFORMATION BELOW.
5. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS AT AND ADJACENT TO THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING THE PERFORMANCE OF THE WORK. THE CONTRACTOR SHALL PREPARE A TRAFFIC CONTROL PLAN FOR OWNER AND/OR CITY APPROVAL AND PROVIDE ALL LIGHTS, SIGNS, BARRICADES, FENCING, FLAGMEN OR OTHER DEVICES NECESSARY TO PROVIDE FOR PUBLIC SAFETY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. THE CONTRACTOR AGREES TO COMPLY WITH THE PROVISIONS OF THE TRAFFIC CONTROL PLAN AND THE LATEST EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES," PART VI, FOR CONSTRUCTION SIGNAGE AND TRAFFIC CONTROL. ALL TEMPORARY AND PERMANENT TRAFFIC SIGNS SHALL COMPLY TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) WITH REGARD TO SIGN SHAPE, COLOR, SIZE, LETTERING, ETC. UNLESS OTHERWISE SPECIFIED. IF APPLICABLE, PART NUMBERS ON SIGNAGE DETAILS REFER TO MUTCD SIGN NUMBERS.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING ANY GROUNDWATER ENCOUNTERED DURING THE CONSTRUCTION OF ANY PORTION OF THIS PROJECT. GROUNDWATER SHALL BE PUMPED, PIPED, REMOVED AND DISPOSED OF IN A MANNER WHICH DOES NOT CAUSE FLOODING OF EXISTING STREETS NOR EROSION ON ABUTTING PROPERTIES IN ORDER TO CONSTRUCT THE IMPROVEMENTS SHOWN ON THESE PLANS. GROUNDWATER TO BE PUMPED SHALL BE TESTED, PERMITTED, AND PUMPED PER THE STATE OF COLORADO AND LOCAL GROUNDWATER DISCHARGING PERMIT REQUIREMENTS.
7. RIM AND GRATE ELEVATIONS SHOWN ON PLANS ARE APPROXIMATE ONLY AND ARE NOT TO BE TAKEN AS FINAL ELEVATIONS. THE CONTRACTOR SHALL ADJUST RIMS AND OTHER IMPROVEMENTS TO MATCH FINAL PAVEMENT AND FINISHED GRADE ELEVATIONS.
8. THE EXISTING AND PROPOSED ELEVATIONS OF FLATWORK, SIDEWALKS, CURBS, THRESHOLDS, PAVING, ETC. AS SHOWN HEREON ARE BASED ON EXTRAPOLATION OF FIELD SURVEY DATA, EXISTING CONDITIONS, AND DATA PROVIDED BY OTHERS. AT CRITICAL AREAS AND SITE FEATURES, CONTRACTOR SHALL HAVE FORMWORK INSPECTED AND APPROVED BY OWNER, OWNER'S REPRESENTATIVE, OR ENGINEER PRIOR TO PLACING CONCRETE. MINOR ADJUSTMENTS, AS APPROVED, TO PROPOSED GRADES, INVERTS, ETC. MAY BE REQUIRED TO PREVENT PONDING OR SLOPE NOT IN CONFORMANCE WITH MUNICIPAL STANDARDS. ALL FLATWORK MUST PREVENT PONDING AND PROVIDE POSITIVE DRAINAGE AWAY FROM EXISTING AND PROPOSED BUILDINGS, WALLS, ROOF DRAIN OUTFALLS, ACROSS DRIVES AND WALKS, ETC., TOWARDS THE PROPOSED INTENDED DRAINAGE FEATURES AND CONVEYANCES.
9. FINAL LIMITS OF REQUIRED ASPHALT SAWCUTTING AND PATCHING MAY VARY FROM LIMITS SHOWN ON PLANS. CONTRACTOR TO PROVIDE SAWCUT AND PATCH WORK TO ACHIEVE POSITIVE DRAINAGE AND A SMOOTH TRANSITION TO EXISTING ASPHALT WITHIN SLOPES ACCEPTABLE TO THE ENGINEER AND WITHIN MUNICIPAL STANDARDS. CONTRACTOR SHALL PROVIDE ADDITIONAL SAWCUTTING AND PATCHING AT UTILITY WORK, CONNECTION POINTS TO EXISTING PAVEMENT AND FEATURES, ETC. THAT MAY NOT BE DELINEATED ON PLANS.
10. ANY EXISTING MONITORING WELLS, CLEANOUTS, VALVE BOXES, ETC. TO BE PROTECTED AND TO REMAIN IN SERVICE. IF FEATURES EXIST, EXTEND OR LOWER TO FINAL SURFACE WITH LIKE KIND CAP WITH STANDARD CAST ACCESS LID WITH SAME MARKINGS. IN LANDSCAPED AREAS PROVIDE A CONCRETE COLLAR (18"x18"x6" THICK) AT ALL EXISTING AND PROPOSED MONITORING WELLS, CLEANOUTS, VALVE BOXES, ETC.
11. OWNER TO APPROVE ALL PRIVATE CONCRETE FINISHING, JOINT PATTERNS AND COLORING REQUIREMENTS PRIOR TO CONSTRUCTION. SUBMIT JOINT LAYOUT PLAN TO OWNER FOR APPROVAL PRIOR TO CONSTRUCTION.
12. PIPE LENGTHS AND HORIZONTAL CONTROL POINTS SHOWN ARE FROM CENTER OF STRUCTURES, END OF FLARED END SECTIONS, ETC. SEE STRUCTURE DETAILS FOR EXACT HORIZONTAL CONTROL LOCATION. CONTRACTOR IS RESPONSIBLE FOR ADJUSTING ACTUAL PIPE LENGTHS TO ACCOUNT FOR STRUCTURES AND LENGTH OF FLARED END SECTIONS.
13. ALL SURPLUS MATERIALS, TOOLS, AND TEMPORARY STRUCTURES, FURNISHED BY THE CONTRACTOR, SHALL BE REMOVED FROM THE PROJECT SITE BY THE CONTRACTOR. ALL DEBRIS AND RUBBISH CAUSED BY THE OPERATIONS OF THE CONTRACTOR SHALL BE REMOVED, AND THE AREA OCCUPIED DURING CONSTRUCTION ACTIVITIES SHALL BE RESTORED TO ITS ORIGINAL CONDITION, WITHIN 48 HOURS OF PROJECT COMPLETION, UNLESS OTHERWISE DIRECTED BY THE MUNICIPALITY OR OWNER'S REPRESENTATIVE.
14. THE CONTRACTOR IS REQUIRED TO PROVIDE AND MAINTAIN EROSION AND SEDIMENT CONTROL MEASURES IN ACCORDANCE WITH THE LOCAL JURISDICTION, THE STATE OF COLORADO, MILE HIGH FLOOD DISTRICT "URBAN STORM DRAINAGE CRITERIA MANUAL VOLUME 3", THE M–STANDARD PLANS OF THE COLORADO DEPARTMENT OF TRANSPORTATION, AND THE APPROVED EROSION CONTROL PLAN. JURISDICTIONAL AUTHORITY MAY REQUIRE THE CONTRACTOR TO PROVIDE ADDITIONAL EROSION CONTROL MEASURES AT THE CONTRACTOR'S EXPENSE DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE PLANS DO NOT FUNCTION AS INTENDED. THE CONTRACTOR IS RESPONSIBLE FOR PROHIBITING SILT AND DEBRIS LADEN RUNOFF FROM LEAVING THE SITE, AND FOR KEEPING ALL PUBLIC AREAS FREE OF MUD AND DEBRIS. THE CONTRACTOR IS RESPONSIBLE FOR RE–ESTABLISHING FINAL GRADES AND FOR REMOVING ACCUMULATED SEDIMENTATION FROM ALL AREAS INCLUDING SWALES AND DETENTION/WATER QUALITY AREAS. CONTRACTOR SHALL REMOVE TEMPORARY EROSION CONTROL MEASURES AND REPAIR AREAS AS REQUIRED AFTER VEGETATION IS ESTABLISHED AND ACCEPTED BY OWNER AND MUNICIPALITY.
15. ADA COMPLIANCE: THE CROSS–SLOPE OF ALL WALKS MUST BE LESS THAN 1:48 (2.0%) PERPENDICULAR TO DIRECTION OF TRAVEL. RUNNING SLOPE OF ACCESSIBLE WALKS MUST BE NOT STEEPER THAN 1:20 (5.0%) IN DIRECTION OF TRAVEL. MAXIMUM GRADE OF ACCESSIBLE CURB RAMPS AND RAMPS IS 1:12 (8.3%). CURB RAMPS SHALL PROVIDE A LANDING AT THE TOP AND RAMP RUNS PROVIDE LANDINGS AT THE BOTTOM AND TOP OF EACH RAMP RUN AT A SLOPE NOT TO EXCEED 1:48. RAMPS RUNS EXCEEDING SIX INCHES SHALL INCLUDE HANDRAILS. ACCESSIBLE PARKING SPACES AND ACCESS AISLES SHALL NOT EXCEED 1:48 IN ALL DIRECTIONS. CONTRACTOR SHALL NOTIFY ENGINEER PRIOR TO PLACEMENT OF FLATWORK OF SITE CONDITIONS OR DISCREPANCIES WHICH PREVENT TYPICAL REQUIRED GRADES FROM BEING ACHIEVED. ALL RAMPS, STAIRS, EDGE PROTECTION, AND RAILINGS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CURRENT ADA STANDARDS. ACCESSIBLE CURB RAMPS SHALL CONFORM TO THE CDOT M–STANDARDS (SEE DETAIL M–608–1, ETC). ACCESSIBLE FEATURE WITHIN THE PUBLIC RIGHTS–OF–WAY SHALL BE CONSTRUCTED TO CONFORM TO THE LOCAL AUTHORITY HAVING JURISDICTION REQUIREMENTS.
16. PROTECT ALL TREES AND VEGETATION. PLACE CONSTRUCTION FENCING AT DRIP LINE OF TREES AND PLANTS NEAR THE WORK ZONE. DEEP WATER TREES WEEKLY. HAND EXCAVATION REQUIRED AT ROOT ZONES WHERE PROPOSED PAVING OR UTILITY WORK IS WITHIN DRIPLINE OF TREES.
17. LOCATIONS OF CLEANOUTS, LIGHTS, SIGNAGE, JUNCTION BOXES, AND OTHER SIGNIFICANT SITE FEATURES TO BE STAKED FOR ENGINEER AND OR OWNER APPROVAL PRIOR TO WORK. CLEANOUTS, JUNCTION BOXES, AND ADJACENT GRADES TO BE RAISED ONE–HALF INCH AT ASPHALT/CONCRETE (OR 1" AT LANDSCAPING) TO PROVIDE POSITIVE DRAINAGE AWAY FROM FEATURES.
18. SURVEY INFORMATION:
    - 18.1. BENCHMARK INFORMATION: TOPOGRAPHIC INFORMATION WAS PROVIDED BY SCHMIDT LAND SURVEYING, INC. SEE "IMPROVEMENT SURVEY PLAT AND TOPOGRAPHIC SURVEY FOR LOTS 18–24, BLOCK 12, FRISCO TOWN SUBDIVISION". DATED 11/20/20. PROJECT BENCHMARK: ELEVATIONS BASED ON NGS MONUMENT W449 NEAR INTERSECTION OF STATE HIGHWAY NO. 9 AND INTERSTATE 70. NAVD 88 ELEVATION 9058.09 FEET. COORDINATE AND VERIFY ALL VERTICAL AND HORIZONTAL DATA SHOWN IN SURVEY AND REPORT ANY IRREGULARITIES OR DISCREPANCIES TO ENGINEER PRIOR TO CONSTRUCTION.
    - 18.2. BASIS OF BEARINGS: THE SOUTHWEST AND NORTHEAST PROPERTY CORNER OF LOTS 18–24, BLOCK 12, FRISCO TOWN SUBDIVISION.
    - 18.3. HORIZONTAL CONTROL INFORMATION: HORIZONTAL CONTROL COORDINATES ARE BASED ON THE REFERENCED SURVEY AND ARE PROVIDED BY THE POINTS AS SHOWN ON THE PLANS:

CP–1	N1635165.69	E2832439.61	ELEV (NOT PROVIDED)	REBAR & PLASTIC CAP PLS NO. 10847
CP–2	N1635199.43	E2832611.33	ELEV 9041.81	NO. 5 REBAR
CP–3	N1635028.28	E2832466.44	ELEV 9044.30	REBAR & PLASTIC CAP PLS NO. 10847

    - 18.4 SURVEY UTILITY LOCATION INFORMATION PER THE SURVEYOR: SUBSURFACE UTILITIES ARE SHOWN IN APPROXIMATE HORIZONTAL AND VERTICAL LOCATIONS CONSISTENT WITH ASCE 38–02 QUALITY LEVEL "B" (INFORMATION OBTAINED BY THE APPLICATION OF APPROPRIATE SURFACE GEOPHYSICAL METHODS TO DETERMINE THE EXISTENCE AND HORIZONTAL POSITION OF VIRTUALLY ALL UTILITIES WITHIN THE PROJECT LIMITS. THE INFORMATION OBTAINED IN THIS MANNER IS SURVEYED TO PROJECT CONTROL.) AND QUALITY LEVEL "C" (INFORMATION OBTAINED BY SURVEYING AND PLOTTING VISIBLE ABOVE–GROUND UTILITY FEATURES AND BY USING PROFESSIONAL JUDGMENT IN CORRELATING THIS INFORMATION TO QUALITY LEVEL D; INFORMATION DERIVED FROM EXISTING RECORDS OR ORAL RECOLLECTIONS), AND BASED ON FIELD MEASUREMENTS PROVIDED BY THE OWNER AND THE CONTRACTOR. SUBSURFACE UTILITIES ARE NOT DEPICTED TO THE EXTENT SET FORTH IN ASCE 38–02 QUALITY LEVELS "A" (INFORMATION OBTAINED THROUGH THE NONDESTRUCTIVE EXPOSURE OF UNDERGROUND UTILITIES, AND ALSO PROVIDES THE TYPE, SIZE, CONDITION, MATERIAL AND OTHER CHARACTERISTICS OF UNDERGROUND FEATURES.). TO THE EXTENT DEEMED NECESSARY FOR THE PROTECTION OF PERSONS AND PROPERTY, POTHOLING OR OTHER PRECISE MAPPING MAY BE COMPLETED TO CONFIRM THE EXACT LOCATION OF ANY SUBSURFACE UTILITIES. NOTIFY OWNER AND ENGINEER WITH ALL UTILITY INFORMATION PRIOR TO CONSTRUCTION.VISIT HTTPS://WWW.FHWA.DOT.GOV/PROGRAMADMIN/SUEINDEX.CFM FOR MORE INFORMATION.
19. THE CONTRACTOR AT THE CONTRACTORS EXPENSE SHALL FURNISH THE OWNER AND ENGINEER OF RECORD A COMPLETE SET OF CONSTRUCTION RECORD DRAWINGS ("AS–BUILTS") FOR THE CONSTRUCTED IMPROVEMENTS. THE AS–BUILT SET SHALL SHOW SUFFICIENT DIMENSION TIES TO PERMANENT SURFACE FEATURES OR NORTHING/EASTING POINTS FOR ALL BURIED FACILITIES TO ALLOW FOR FUTURE LOCATING. THE AS–BUILT SET SHALL SHOW AS–BUILT CONTOURS AND ELEVATIONS OF ASPHALT AND CONCRETE FLATWORK, FLOWLINES, GRADE BREAKS, STAIRS, CROSS–SLOPES, HIGH AND LOW POINTS, AND ADDITIONAL ELEVATIONS TO DEMONSTRATE IMPROVEMENTS WERE CONSTRUCTED PER PLANS. THE AS–BUILT SET SHALL SHOW ELEVATIONS OF ALL DETENTION/WATER QUALITY FACILITIES, INCLUDING BUT NOT LIMITED TO BERMS, SPILLWAYS, BASIN BOTTOM, PIPE INVERTS, AND CONTROL STRUCTURE FEATURES (AS SURVEYED AND STAMPED BY A CERTIFIED P.L.S.). THE AS–BUILT SET SHALL ALSO INCLUDE ELEVATIONS OF MANHOLES, PIPES, INLETS, GRATES, AND SIZES OF ALL UTILITIES. THE AS–BUILT SET SHALL SHOW ANY AND ALL VARIATIONS FROM THE APPROVED PLAN. ENGINEER WILL PRODUCE FINAL RECORD DRAWINGS.

JVA CONSULTING ENGINEERS
47 Cooper Creek Way, Suite 300
Winter Park, CO 80482
jvajva.com
970.722.7677

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

JVA Project No: 3427c

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

DRAWN BY: SAR/ZAB **REVIEWED BY:** CWK/KEV

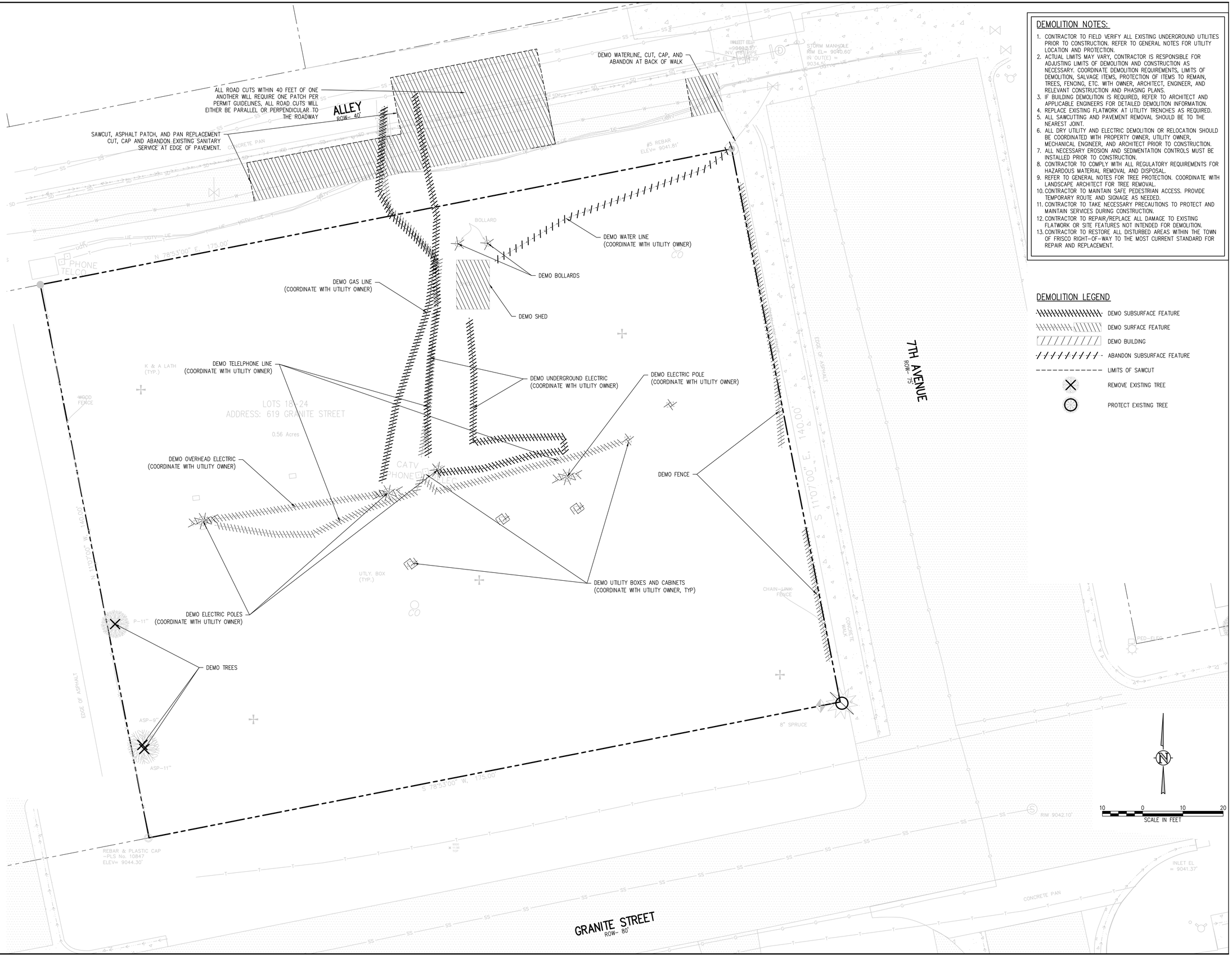
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

GENERAL LEGEND, NOTES & ABBREVIATIONS

CG001

K:\3427c - Granite Street Workforce Housing\Drawings\3427c-00-LNA-00.dwg, 3/25/2022 - 2:30 PM, CWK

PLOT DATE: 5/19/2021 1:20:59 PM



DEMOLITION NOTES:

1. CONTRACTOR TO FIELD VERIFY ALL EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION. REFER TO GENERAL NOTES FOR UTILITY LOCATION AND PROTECTION.
2. ACTUAL LIMITS MAY VARY, CONTRACTOR IS RESPONSIBLE FOR ADJUSTING LIMITS OF DEMOLITION AND CONSTRUCTION AS NECESSARY. COORDINATE DEMOLITION REQUIREMENTS, LIMITS OF DEMOLITION, SALVAGE ITEMS, PROTECTION OF ITEMS TO REMAIN, TREES, FENCING, ETC. WITH OWNER, ARCHITECT, ENGINEER, AND RELEVANT CONSTRUCTION AND PHASING PLANS.
3. IF BUILDING DEMOLITION IS REQUIRED, REFER TO ARCHITECT AND APPLICABLE ENGINEERS FOR DETAILED DEMOLITION INFORMATION.
4. REPLACE EXISTING FLATWORK AT UTILITY TRENCHES AS REQUIRED.
5. ALL SAWCUTTING AND PAVEMENT REMOVAL SHOULD BE TO THE NEAREST JOINT.
6. ALL DRY UTILITY AND ELECTRIC DEMOLITION OR RELOCATION SHOULD BE COORDINATED WITH PROPERTY OWNER, UTILITY OWNER, MECHANICAL ENGINEER, AND ARCHITECT PRIOR TO CONSTRUCTION.
7. ALL NECESSARY EROSION AND SEDIMENTATION CONTROLS MUST BE INSTALLED PRIOR TO CONSTRUCTION.
8. CONTRACTOR TO COMPLY WITH ALL REGULATORY REQUIREMENTS FOR HAZARDOUS MATERIAL REMOVAL AND DISPOSAL.
9. REFER TO GENERAL NOTES FOR TREE PROTECTION. COORDINATE WITH LANDSCAPE ARCHITECT FOR TREE REMOVAL.
10. CONTRACTOR TO MAINTAIN SAFE PEDESTRIAN ACCESS. PROVIDE TEMPORARY ROUTE AND SIGNAGE AS NEEDED.
11. CONTRACTOR TO TAKE NECESSARY PRECAUTIONS TO PROTECT AND MAINTAIN SERVICES DURING CONSTRUCTION.
12. CONTRACTOR TO REPAIR/REPLACE ALL DAMAGE TO EXISTING FLATWORK OR SITE FEATURES NOT INTENDED FOR DEMOLITION.
13. CONTRACTOR TO RESTORE ALL DISTURBED AREAS WITHIN THE TOWN OF FRISCO RIGHT-OF-WAY TO THE MOST CURRENT STANDARD FOR REPAIR AND REPLACEMENT.

DEMOLITION LEGEND

- DEMO SUBSURFACE FEATURE
- DEMO SURFACE FEATURE
- DEMO BUILDING
- ABANDON SUBSURFACE FEATURE
- LIMITS OF SAWCUT
- REMOVE EXISTING TREE
- PROTECT EXISTING TREE

JVA CONSULTING ENGINEERS
47 Cooper Creek Way, Suite 300
Winter Park, CO 80482
jvajva.com
970.722.7677

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

JVA Project No: 3427c

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

DRAWN BY: SAR/ZAB **REVIEWED BY:** CWK/KEV

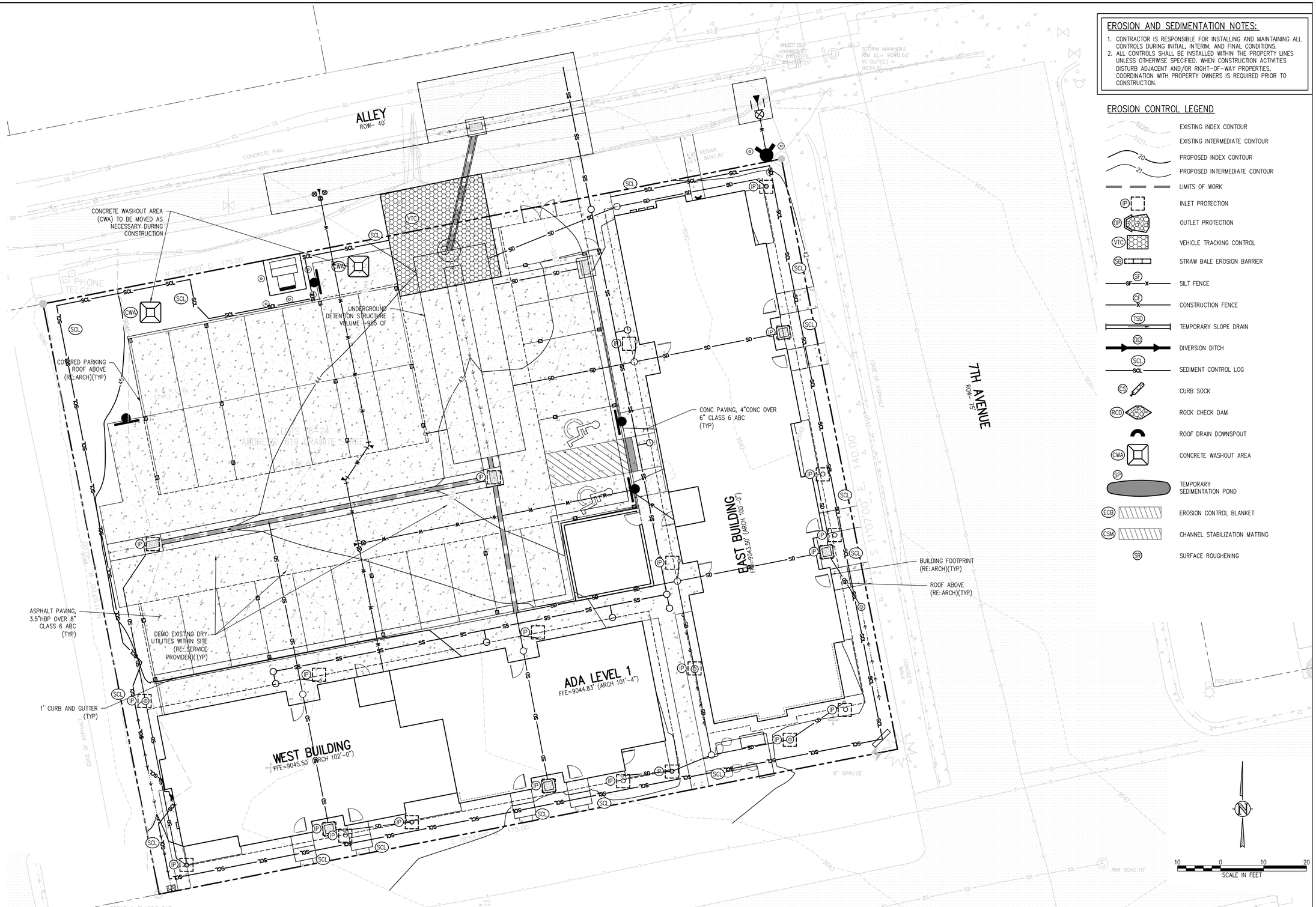
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

DEMOLITION PLAN

CG100

K:\3427c - Granite Street Workforce Housing\Drawings\3427c-00-BMO-00.dwg, 3/25/2022 - 2:30 PM, ZAB

PLOT DATE: 5/19/2021 1:20:59 PM



EROSION AND SEDIMENTATION NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR INSTALLING AND MAINTAINING ALL CONTROLS DURING INITIAL, INTERIM, AND FINAL CONDITIONS.
2. ALL CONTROLS SHALL BE INSTALLED WITHIN THE PROPERTY LINES UNLESS OTHERWISE SPECIFIED. WHEN CONSTRUCTION ACTIVITIES DISTURB ADJACENT AND/OR RIGHT-OF-WAY PROPERTIES, COORDINATION WITH PROPERTY OWNERS IS REQUIRED PRIOR TO CONSTRUCTION.

EROSION CONTROL LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- PROPOSED INDEX CONTOUR
- PROPOSED INTERMEDIATE CONTOUR
- LIMITS OF WORK
- (IP) INLET PROTECTION
- (OP) OUTLET PROTECTION
- (VTC) VEHICLE TRACKING CONTROL
- (SB) STRAW BALE EROSION BARRIER
- (SF) SILT FENCE
- (CF) CONSTRUCTION FENCE
- (TSD) TEMPORARY SLOPE DRAIN
- (DD) DIVERSION DITCH
- (SCL) SEDIMENT CONTROL LOG
- (CS) CURB SOCK
- (RCD) ROCK CHECK DAM
- ROOF DRAIN DOWNSPOUT
- (CWA) CONCRETE WASHOUT AREA
- (SP) TEMPORARY SEDIMENTATION POND
- (ECB) EROSION CONTROL BLANKET
- (CSM) CHANNEL STABILIZATION MATTING
- (SR) SURFACE ROUGHENING

JVA CONSULTING ENGINEERS
47 Cooper Creek Way, Suite 300
Winter Park, CO 80482
jvajva.com
970.722.7677

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

JVA Project No: 3427c

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

DRAWN BY: SAR/ZAB **REVIEWED BY:** CWK/KEV

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

EROSION CONTROL PLAN

CG101

K:\3427c - Granite Street Workforce Housing\Drawings\3427c-CE-EC0-00.dwg, 3/25/2022 - 2:30 PM, ZAB

PLOT DATE: 5/19/2021 1:20:59 PM

GRADING AND DRAINAGE NOTES:

1. CONTRACTOR TO FIELD VERIFY ALL EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION. REFER TO GENERAL NOTES FOR UTILITY LOCATION AND PROTECTION.
2. REFER TO HORIZONTAL CONTROL PLAN FOR FURTHER INFORMATION PERTAINING TO CURB & GUTTER, CHASES, AND DRAINAGE PANS.
3. CONTRACTOR IS RESPONSIBLE FOR RESTORING ALL DISTURBED AREAS TO THEIR ORIGINAL CONDITIONS.
4. ALL SPOT ELEVATIONS ARE TO FINISHED GRADE OR FLOWLINE UNLESS OTHERWISE SPECIFIED.
5. IF WALL IS SHOWN, TG DENOTES THE FINISHED GRADE ADJACENT TO THE HIGH SIDE OF THE WALL. BG DENOTES THE FINISHED GRADE ADJACENT TO THE LOW SIDE OF THE WALL. REFER TO ARCH PLANS/DETAILS FOR WALL ELEVATIONS BEYOND THE ADJACENT FINISHED GRADES (EXPOSED WALL, CAP/FOOTER, ETC.)

ALLEY
ROW= 40'

7TH AVENUE
ROW= 75'

GRANITE STREET
ROW= 80'

MATCH EXISTING GRADES ALONG PROPERTY LINE

CONTECH CMP UNDERGROUND DETENTION STRUCTURE VOLUME =955 CF

COVERED PARKING ROOF ABOVE (RE: ARCH)(TYP)

FOR STORM SEWER DESIGN SEE STORM SEWER PLAN ON SHEET CG103 (TYP)

GRADING IN DESIGNATED ADA PARKING SPACES SHALL BE LESS THAN 2.00% IN ANY DIRECTION

BUILDING FOOTPRINT (RE: ARCH)(TYP)

ROOF ABOVE (RE: ARCH)(TYP)

RAISED STEM WALL (RE: STRUCT)(TYP)

WEST BUILDING
FFE=9045.50' (ARCH 102'-0")

EAST BUILDING
FFE=9043.50' (ARCH 100'-0")

ADA LEVEL 1
FFE=9044.83' (ARCH 101'-4")

FFE=9043.3

REBAR & PLASTIC CAP
PLS No. 10847
ELEV= 9044.30'

INLET EL
= 9041.37'

STORM MANHOLE
RIM EL= 9040.60'
IN OUT(E) = 9034.54'

REBAR
9041.81'

LOTS 13-
FRISCO TO
SCHEDULE

8" SPRUCE

CONCRETE PAN

EDGE OF ASPHALT

TOP BACK OF CURB (TYP)

10 0 10 20
SCALE IN FEET

JVA CONSULTING ENGINEERS
47 Cooper Creek Way, Suite 300
Winter Park, CO 80482
jvajva.com
970.722.7677

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

JVA Project No: 3427c

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

DRAWN BY: SAR/ZAB **REVIEWED BY:** CWK/KEV

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

GRADING AND DRAINAGE PLAN

CG102

K:\3427c - Granite Street Workforce Housing\Drawings\3427c-01-GRP-00.dwg, 3/25/2022 - 2:30 PM, ZAB

PLOT DATE: 5/19/2021 1:20:59 PM

GRADING AND DRAINAGE NOTES:

1. CONTRACTOR TO FIELD VERIFY ALL EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION. REFER TO GENERAL NOTES FOR UTILITY LOCATION AND PROTECTION.
2. REFER TO HORIZONTAL CONTROL PLAN FOR FURTHER INFORMATION PERTAINING TO CURB & GUTTER, CHASES, AND DRAINAGE PANS.
3. CONTRACTOR IS RESPONSIBLE FOR RESTORING ALL DISTURBED AREAS TO THEIR ORIGINAL CONDITIONS.
4. ALL SPOT ELEVATIONS ARE TO FINISHED GRADE OR FLOWLINE UNLESS OTHERWISE SPECIFIED.
5. IF WALL IS SHOWN, TG DENOTES THE FINISHED GRADE ADJACENT TO THE HIGH SIDE OF THE WALL. BG DENOTES THE FINISHED GRADE ADJACENT TO THE LOW SIDE OF THE WALL. REFER TO ARCH PLANS/DETAILS FOR WALL ELEVATIONS BEYOND THE ADJACENT FINISHED GRADES (EXPOSED WALL, CAP/FOOTER, ETC.)

CONSULTING ENGINEERS

JVA CONSULTING ENGINEERS
47 Cooper Creek Way, Suite 300
Winter Park, CO 80482
jvajva.com
970.722.7677

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

JVA Project No: 3427c

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

DRAWN BY: SAR/ZAB **REVIEWED BY:** CWK/KEV

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

STORM SEWER PLAN

CG103

SCALE IN FEET: 10 0 10 20

K:\3427c - Granite Street Workforce Housing\Drawings\3427c-01-STM-00.dwg, 3/25/2022 - 2:31 PM, ZAB

PLOT DATE: 5/18/2021 1:20:59 PM

UTILITY NOTES:

1. CONTRACTOR TO FIELD VERIFY ALL EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION. REFER TO GENERAL NOTES FOR UTILITY LOCATION AND PROTECTION.
2. ALL DRY UTILITY AND ELECTRIC DESIGNS ARE PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. SEE MEP PLANS AND SPECIFICATIONS AND COORDINATE WITH ALL UTILITY OWNERS AS NEEDED.
3. CONTRACTOR TO MARK ALL UTILITY STUBS WITH MARKERS.

WET TAP CONNECTION TO EXISTING WATER MAIN W/ THREE VALVES (CONTRACTOR TO VERIFY LOCATION, DEPTH, SIZE, AND MATERIAL OF EXISTING WATER MAIN PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER OF ANY CONFLICTS AND/OR DISCREPANCIES) N1635191.42 E2832503.90

CONNECT TO EXISTING 15" PVC SANITARY SEWER MAIN PER TOWN OF FRISCO STANDARDS INV IN(W) 9035.37 (12" PVC) INV IN(S) 9036.31 (6" PVC) INV OUT(E) 9035.37 (12" PVC) N1635220.73 E2832560.56

EXIST 15" PVC

1 CG510 64 LF 6" PVC @ 1.00%

CONNECT TO EXISITNG WATER MAIN WITH TEE (CONTRACTOR TO VERIFY LOCATION, DEPTH, SIZE, AND MATERIAL OF EXISTING WATER MAIN PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER OF ANY CONFLICTS AND/OR DISCREPANCIES)

7 LF 6" DIP @ MIN DEPTH PER TOWN OF FRISCO STANDARDS

5 CG510 FIRE HYDRANT ASSEMBLY COORDINATE FINAL LOCATION W/ TOWN OF FRISCO

EXISTING FIRE HYDRANT

CUT CAP AND ABANDON EXISTING WATER SERVICES AT PAVEMENT (TYP)

SAWCUT AND T-PATCH EXISTING ASPHALT FOR NEW UTILITY INSTALLATION (TYP)

ALLEY
ROW= 40'

FDC (RE:PLUMB)

CO
RIM 9042.72
INV IN(S) 9036.64 (6" PVC)
INV OUT(N) 9036.64 (6" PVC)
N1635187.68
E2832567.06

EXISTING TRANSFORMER

PROPOSED TRANSFORMER (RE:ELEC)

20 LF 6" PVC @ 100%

CONNECT TO BUILDING W/ CO (RE:PLUMB) RIM 9043.33 INV OUT(W) 9037.08 (4" PVC)

3 LF 4" PVC @ 2.00%

6"X4" PVC TEE N1635159.06 E2832572.88

6"X4" PVC TEE N1635132.80 E2832577.84

60 LF 4" DIP

COVERED PARKING ROOF ABOVE (RE:ARCH)(TYP)

45° BEND W/TB N1635132.78 E2832515.42

3 LF 4" PVC @ 2.00%
CONNECT TO BUILDING W/ CO (RE:PLUMB) RIM 9042.90 INV OUT(W) 9037.34 (4" PVC)

7TH AVENUE
ROW= 75'

1 CG510 15 LF 4" DIP

12 LF 4" DIP

45° BEND W/TB N1635124.70 E2832510.00

70 LF 4" DIP

45° BEND W/TB N1635122.28 E2832576.18 — 6 CG510

35 LF 6" PVC @ 1.00%

CONNECT TO BUILDING (RE:PLUMB)

TEE W/ FRONT & RIGHT VALVES N1635109.85 E2832512.92 — 4 CG510

64 LF 4" DIP

UTILITY CROSSING, ENCASE WATER PIPE 10' ON EITHER SIDE OF CROSSING PER TOWN OF FRISCO STANDARDS
13 LF 6" PVC @ 1.00%

RISER ROOM (RE: ARCH)

EAST BUILDING
FFE=9043.50' (ARCH 100'-0")

2 CG510 CO
RIM 9043.36
INV IN(W) 9037.56 (6" PVC)
INV IN(S) 9037.64 (4" PVC)
INV OUT(N) 9037.56 (6" PVC)
N1635098.10
E2832584.66

3 LF 4" PVC @ 2.00%
CONNECT TO BUILDING W/ CO (RE:PLUMB) RIM 9043.34 INV OUT(N) 9037.71 (4" PVC)

6"X4" PVC TEE N1635095.51 E2832571.48

3 LF 4" PVC @ 2.00%
CONNECT TO BUILDING W/ CO (RE:PLUMB) RIM 9043.87 INV OUT(N) 9037.83 (4" PVC)

50 LF 6" PVC @ 1.00%

30 LF 6" PVC @ 1.00%

CONNECT TO BUILDING W/ CO (RE:PLUMB) RIM 9044.81 INV OUT(N) 9038.13 (4" PVC)

CONNECT TO BUILDING (RE:PLUMB)

ADA LEVEL 1
FFE=9044.83' (ARCH 101'-4")

6"X4" PVC TEE N1635089.76 E2832542.21

3 LF 4" PVC @ 2.00%

BUILDING FOOTPRINT (RE:ARCH)(TYP)

ROOF ABOVE (RE:ARCH)(TYP)

CO
RIM 9045.40
INV IN(S) 9038.57 (4" PVC)
INV OUT(E) 9038.49 (6" PVC)
N1635080.12
E2832493.15

CONNECT TO BUILDING W/ CO (RE:PLUMB) RIM 9045.46 INV OUT(N) 9038.63 (4" PVC)

3 LF 4" PVC @ 2.00%

WEST BUILDING
FFE=9045.50' (ARCH 102'-0")

RISER ROOM (RE: ARCH)

FDC (RE:PLUMB)

INSULATE ENTIRE PROPOSED SANITARY SERVICE TO TOWN OF FRISCO AND FRISCO SANITATION DISTRICT STANDARDS (TYP)

8" SPRUCE

RIM 9042.10'

10 0 10 20
SCALE IN FEET

REBAR & PLASTIC CAP
PLS No. 10847
ELEV= 9044.30'

INLET EL = 9041.37'

CONCRETE PAN

EXISTING FIRE HYDRANT

GRANITE STREET
ROW= 80'

K:\3427c - Granite Street Workforce Housing\Drawings\3427c-02-UTP-00.dwg, 3/25/2022 - 2:31 PM, ZAB

PLOT DATE: 5/19/2021 1:20:59 PM

JVA CONSULTING ENGINEERS

JVA CONSULTING ENGINEERS
47 Cooper Creek Way, Suite 300
Winter Park, CO 80482
jvajva.com
970.722.7677

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

JVA Project No: 3427c

Sheet Issue & Revision Log

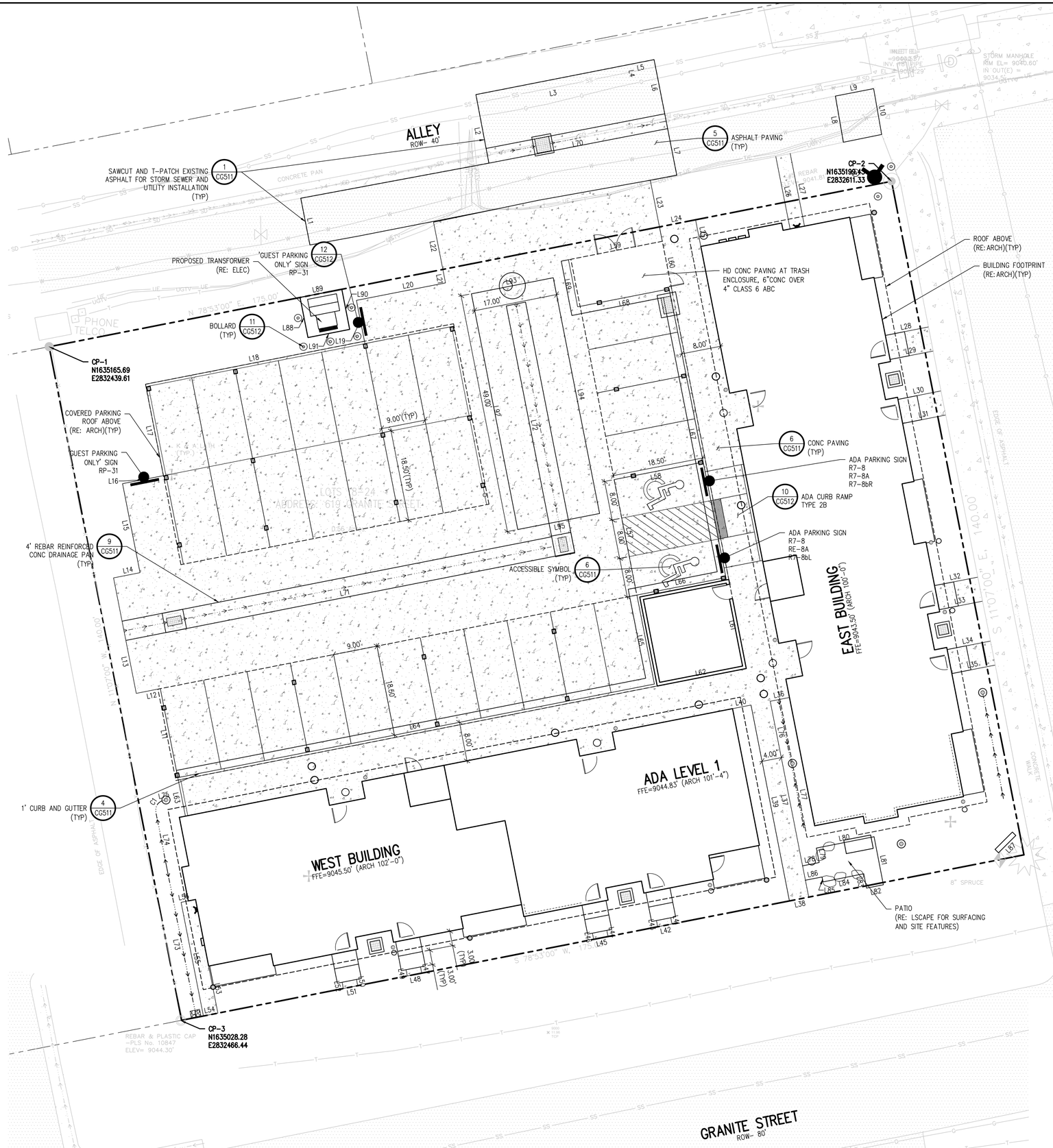
No	Date	Description
	03/25/22	BID SET

DRAWN BY: SAR/ZAB **REVIEWED BY:** CWK/KEV

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

UTILITY PLAN

CG104



LINE TABLE			
LINE	LENGTH	DIRECTION	START (N, E)
L1	9.72	S11° 07' 00"E	(1635195.98, 2832490.90)
L2	7.55	N10° 42' 02"W	(1635206.14, 2832528.69)
L3	31.04	N79° 17' 58"E	(1635213.56, 2832527.29)
L4	3.85	S11° 07' 00"E	(1635223.10, 2832557.04)
L5	6.00	S78° 53' 00"W	(1635224.26, 2832562.93)
L6	11.26	N11° 07' 00"W	(1635213.21, 2832565.10)
L7	9.70	S11° 07' 00"E	(1635210.19, 2832565.69)
L8	9.57	N9° 48' 25"W	(1635207.40, 2832601.52)
L9	7.95	N79° 00' 58"E	(1635216.82, 2832599.89)
L10	9.50	S9° 53' 13"E	(1635218.34, 2832607.69)
L11	17.00	N11° 07' 00"W	(1635079.28, 2832465.55)
L12	5.00	S78° 53' 00"W	(1635095.96, 2832462.27)
L13	24.00	N11° 07' 00"W	(1635095.00, 2832457.37)
L14	5.50	N78° 53' 00"E	(1635118.55, 2832452.74)
L15	18.50	N11° 07' 00"W	(1635119.61, 2832458.14)
L16	8.50	N78° 53' 00"E	(1635137.76, 2832454.57)
L17	19.00	N11° 07' 00"W	(1635139.40, 2832462.91)
L18	45.50	N78° 52' 55"E	(1635158.04, 2832459.25)
L19	8.50	N11° 07' 06"W	(1635166.82, 2832503.89)
L20	18.50	N78° 53' 00"E	(1635175.16, 2832502.26)
L21	2.79	N11° 07' 00"W	(1635178.72, 2832520.41)
L22	9.82	N11° 07' 00"W	(1635181.46, 2832519.87)
L23	9.70	S11° 07' 00"E	(1635199.66, 2832562.16)
L24	7.50	N78° 53' 00"E	(1635190.14, 2832564.03)
L25	5.54	S11° 07' 00"E	(1635191.59, 2832571.39)
L26	15.07	S11° 07' 00"E	(1635204.51, 2832587.74)
L27	15.11	S11° 07' 00"E	(1635205.13, 2832590.68)
L28	8.97	N78° 53' 00"E	(1635168.00, 2832610.08)
L29	8.96	N78° 53' 00"E	(1635163.09, 2832611.04)
L30	8.94	N78° 53' 00"E	(1635154.96, 2832612.64)
L31	8.94	N78° 53' 00"E	(1635150.05, 2832613.60)
L32	8.97	N78° 53' 00"E	(1635116.97, 2832620.10)
L33	8.98	N78° 53' 00"E	(1635112.07, 2832621.07)
L34	9.01	N78° 53' 00"E	(1635103.93, 2832622.66)
L35	8.99	N78° 53' 00"E	(1635099.03, 2832623.63)
L36	4.00	N78° 53' 00"E	(1635093.39, 2832586.60)
L37	40.71	N11° 07' 00"W	(1635053.44, 2832594.45)
L38	4.00	S78° 53' 00"W	(1635053.44, 2832594.45)
L39	40.71	S11° 07' 00"E	(1635092.61, 2832582.68)
L40	3.83	N78° 53' 00"E	(1635091.88, 2832578.92)
L41	1.29	N11° 07' 00"W	(1635047.97, 2832566.59)
L42	3.00	N78° 53' 00"E	(1635047.39, 2832563.65)
L43	1.29	S11° 07' 00"E	(1635048.66, 2832563.40)
L44	1.29	N11° 07' 00"W	(1635045.40, 2832553.55)
L45	3.00	N78° 53' 00"E	(1635044.83, 2832550.60)
L46	1.29	S11° 07' 00"E	(1635046.09, 2832550.36)
L47	1.29	N11° 07' 00"W	(1635037.94, 2832515.57)
L48	3.00	N78° 53' 00"E	(1635037.36, 2832512.62)
L49	1.29	S11° 07' 00"E	(1635038.63, 2832512.37)
L50	1.29	N11° 07' 00"W	(1635035.38, 2832502.52)

LINE TABLE			
LINE	LENGTH	DIRECTION	START (N, E)
L51	3.00	N78° 53' 00"E	(1635034.80, 2832499.58)
L52	1.29	S11° 07' 00"E	(1635036.07, 2832499.33)
L53	9.79	S11° 07' 00"E	(1635039.38, 2832472.12)
L54	3.00	N78° 53' 00"E	(1635029.20, 2832471.06)
L55	23.63	S11° 07' 00"E	(1635052.38, 2832466.51)
L56	1.50	S78° 53' 00"W	(1635052.67, 2832467.98)
L57	22.50	S11° 07' 00"E	(1635138.60, 2832554.79)
L58	17.00	S78° 53' 00"W	(1635141.88, 2832571.47)
L59	19.00	N78° 53' 00"E	(1635183.53, 2832545.96)
L60	9.29	S11° 07' 00"E	(1635187.20, 2832564.60)
L61	18.50	N11° 07' 00"W	(1635100.07, 2832581.72)
L62	18.50	N78° 53' 00"E	(1635096.50, 2832563.57)
L63	8.00	N11° 07' 00"W	(1635069.96, 2832467.38)
L64	99.00	N78° 53' 00"E	(1635077.81, 2832465.84)
L65	18.50	N11° 07' 00"W	(1635096.90, 2832562.98)
L66	18.50	N78° 53' 00"E	(1635115.05, 2832559.42)
L67	60.00	N11° 07' 00"W	(1635118.62, 2832577.57)
L68	19.00	S78° 53' 00"W	(1635177.49, 2832566.00)
L69	9.79	N11° 07' 00"W	(1635173.83, 2832547.36)
L70	37.10	S79° 08' 01"W	(1635211.70, 2832565.39)
L71	91.25	S78° 53' 00"W	(1635125.35, 2832544.40)
L72	50.00	N11° 07' 00"W	(1635125.35, 2832544.40)
L73	30.63	N11° 07' 00"W	(1635028.91, 2832469.59)
L74	12.08	S11° 07' 00"E	(1635070.81, 2832461.36)
L75	0.50	S78° 53' 00"W	(1635073.26, 2832463.42)
L76	13.33	N11° 07' 00"W	(1635080.69, 2832591.14)
L77	13.33	S11° 07' 00"E	(1635080.69, 2832591.14)
L78	3.45	N78° 53' 00"E	(1635059.83, 2832593.20)
L79	3.00	N11° 07' 00"W	(1635060.49, 2832596.58)
L80	12.00	N78° 53' 00"E	(1635063.44, 2832596.00)
L81	9.98	S10° 57' 12"E	(1635065.76, 2832607.78)
L82	3.50	S78° 53' 00"W	(1635055.96, 2832609.67)
L83	2.98	N11° 07' 00"W	(1635055.28, 2832606.24)
L84	8.43	S78° 41' 20"W	(1635058.21, 2832605.66)
L85	1.03	N13° 10' 12"W	(1635056.55, 2832597.39)
L86	3.45	S78° 53' 00"W	(1635057.55, 2832597.16)
L87	5.00	S45° 00' 00"W	(1635066.01, 2832636.67)
L88	8.33	S11° 07' 00"E	(1635175.74, 2832490.76)
L89	8.67	S78° 53' 00"W	(1635177.41, 2832499.26)
L90	8.33	N11° 07' 00"W	(1635169.24, 2832500.87)
L91	8.67	N78° 53' 00"E	(1635167.57, 2832492.37)
L92	49.00	N11° 07' 00"W	(1635128.41, 2832535.14)
L93	17.00	N78° 53' 00"E	(1635176.49, 2832525.69)
L94	49.00	S11° 07' 00"E	(1635179.77, 2832542.37)
L95	17.00	S78° 53' 00"W	(1635131.69, 2832551.82)

CURVE TABLE						
CURVE	LENGTH	RADIUS	DELTA	CHORD	CHORD LEN	START (N, E)
C1	3.14	2.00	90°00'00"	S33°53'00"W	2.83	(1635073.16, 2832462.93)

HORIZONTAL CONTROL NOTES:

1. ALL DIMENSIONS AND RADII ARE TO FACE OF CURB, FACE OF BUILDING AND EDGE OF WALK UNLESS OTHERWISE NOTED.
2. CONTRACTOR TO REPAIR/REPLACE ALL DAMAGE TO EXISTING FLATWORK OR SITE FEATURES NOT INTENDED FOR DEMOLITION.
3. REFER TO GRADING AND DRAINAGE PLAN FOR FURTHER INFORMATION PERTAINING TO CURB & GUTTER, CHASES, AND DRAINAGE PANS.

HORIZONTAL CONTROL LEGEND

- ASPHALT PAVING
- CONCRETE PAVING
- LIMITS OF SAWCUT

JVA CONSULTING ENGINEERS

JVA CONSULTING ENGINEERS
47 Cooper Creek Way, Suite 300
Winter Park, CO 80482
jvajva.com
970.722.7677

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

JVA Project No: 3427c

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

DRAWN BY: SAR/ZAB **REVIEWED BY:** CWK/KEV

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

SITE PLAN

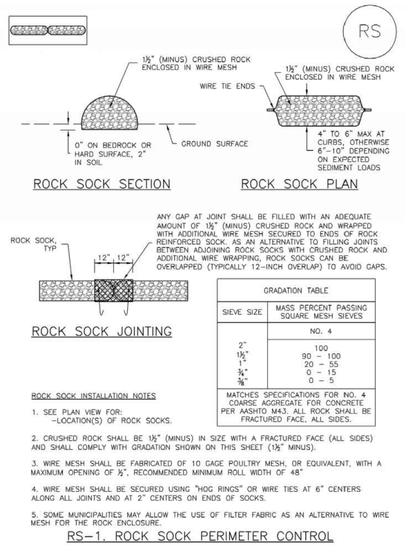
CG105

PLOT DATE: 5/19/2021 1:20:59 PM
K:\3427c - Granite Street Workforce Housing\Drawings\3427c-03-HCP-00.dwg, 3/25/2022 - 2:31 PM, ZAB

Table CP-1. Typical Phased BMP Installation for Construction Projects

Project Phase	BMPs
Pre-disturbance, Site Access	▪ Install sediment controls downgradient of access point (on paved streets this may consist of inlet protection). ▪ Establish vehicle tracking control at entrances to paved streets. Fence as needed. ▪ Use construction fencing to define the boundaries of the project and limit access to areas of the site that are not to be disturbed. **Note: it may be necessary to protect inlets in the general vicinity of the site, even if not downgradient, if there is a possibility that sediment tracked from the site could contribute to the inlets.**
Site Clearing and Grubbing	▪ Install perimeter controls as needed on downgradient perimeter of site (silt fence, wattles, etc). ▪ Limit disturbance to those areas planned for disturbance and protect undisturbed areas within the site (construction fence, flagging, etc). ▪ Preserve vegetative buffer at site perimeter. ▪ Create stabilized staging area. ▪ Locate portable toilets on flat surfaces away from drainage paths. Stake in areas susceptible to high winds. ▪ Construct concrete washout area and provide signage. ▪ Establish waste disposal areas. ▪ Install sediment basins. ▪ Create dirt perimeter berms and/or brush barriers during grubbing and clearing. ▪ Separate and stockpile topsoil, leave roughened and/or cover. ▪ Protect stockpiles with perimeter control BMPs. Stockpiles should be located away from drainage paths and should be accessed from the upgradient side so that perimeter controls can remain in place on the downgradient side. Use erosion control blankets, temporary seeding, and/or mulch for stockpiles that will be inactive for an extended period. ▪ Leave disturbed area of site in a roughened condition to limit erosion. Consider temporary revegetation for areas of the site that have been disturbed but that will be inactive for an extended period. ▪ Water to minimize dust but not to the point that watering creates runoff.

Project Phase	BMPs
Utility And Infrastructure Installation	**In Addition to the Above BMPs:** ▪ Close trench as soon as possible (generally at the end of the day). ▪ Use rough-cut street control or apply road base for streets that will not be promptly paved. ▪ Provide inlet protection as streets are paved and inlets are constructed. ▪ Protect and repair BMPs, as necessary. ▪ Perform street sweeping as needed.
Building Construction	**In Addition to the Above BMPs:** ▪ Implement materials management and good housekeeping practices for home building activities. ▪ Use perimeter controls for temporary stockpiles from foundation excavations. ▪ For lots adjacent to streets, lot-line perimeter controls may be necessary at the back of curb.
Final Grading	**In Addition to the Above BMPs:** ▪ Remove excess or waste materials. ▪ Remove stored materials.
Final Stabilization	**In Addition to the Above BMPs:** ▪ Seed and mulch/tackify. ▪ Seed and install blankets on steep slopes. ▪ Remove all temporary BMPs when site has reached final stabilization.



ROCK SOCK MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. ROCK SOCKS SHALL BE REPLACED IF THEY BECOME HEAVILY SOILED, OR DAMAGED BEYOND REPAIR.

5. SEDIMENT ACCUMULATED UPSTREAM OF ROCK SOCKS SHALL BE REMOVED AS NEEDED TO MAINTAIN FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY ½ OF THE HEIGHT OF THE ROCK SOCK.

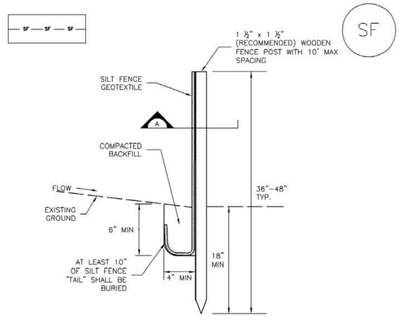
6. ROCK SOCKS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

7. WHEN ROCK SOCKS ARE REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

NOTE: THE DETAILS INCLUDED WITH THIS FACT SHEET SHOW COMMONLY USED, CONVENTIONAL METHODS OF ROCK SOCK INSTALLATION IN THE DENVER METROPOLITAN AREA. THERE ARE MANY OTHER SIMILAR PROPRIETARY PRODUCTS ON THE MARKET. UDFCD NEITHER ENDORSES NOR DISCOURAGES USE OF PROPRIETARY PROTECTION PRODUCTS; HOWEVER, IN THE EVENT PROPRIETARY METHODS ARE USED, THE APPROPRIATE DETAIL FROM THE MANUFACTURER MUST BE INCLUDED IN THE SWMP AND THE BMP MUST BE INSTALLED AND MAINTAINED AS SHOWN IN THE MANUFACTURER'S DETAILS.



SILT FENCE INSTALLATION NOTES

1. SILT FENCE MUST BE PLACED AWAY FROM THE TOE OF THE SLOPE TO ALLOW FOR WATER PONDING. SILT FENCE AT THE TOE OF A SLOPE SHOULD BE INSTALLED IN A FLAT LOCATION AT LEAST SEVERAL FEET (2–5 FT) FROM THE TOE OF THE SLOPE TO ALLOW ROOM FOR PONDING AND DEPOSITION.

2. A UNIFORM 6" X 4" ANCHOR TRENCH SHALL BE EXCAVATED USING TRENCHER OR SILT FENCE INSTALLATION DEVICE. NO ROAD GRADERS, BACKHOES, OR SIMILAR EQUIPMENT SHALL BE USED.

3. COMPACT ANCHOR TRENCH BY HAND WITH A "JUMPING JACK" OR BY WHEEL ROLLING. COMPACTION SHALL BE SUCH THAT SILT FENCE RESISTS BEING PULLED OUT OF ANCHOR TRENCH BY HAND.

4. SILT FENCE SHALL BE PULLED TIGHT AS IT IS ANCHORED TO THE STAKES. THERE SHOULD BE NO NOTICEABLE SAG BETWEEN STAKES AFTER IT HAS BEEN ANCHORED TO THE STAKES.

5. SILT FENCE FABRIC SHALL BE ANCHORED TO THE STAKES USING 1" HEAVY DUTY STAPLES OR NAILS WITH 1" HEADS. STAPLES AND NAILS SHOULD BE PLACED 3" ALONG THE FABRIC DOWN THE STAKE.

6. AT THE END OF A RUN OF SILT FENCE ALONG A CONTOUR, THE SILT FENCE SHOULD BE TURNED PERPENDICULAR TO THE CONTOUR TO CREATE A "J-HOOK." THE "J-HOOK" EXTENDING PERPENDICULAR TO THE CONTOUR SHOULD BE OF SUFFICIENT LENGTH TO KEEP RUNOFF FROM FLOWING AROUND THE END OF THE SILT FENCE (TYPICALLY 10' – 20').

7. SILT FENCE SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

SILT FENCE MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SEDIMENT ACCUMULATED UPSTREAM OF THE SILT FENCE SHALL BE REMOVED AS NEEDED TO MAINTAIN THE FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY 6".

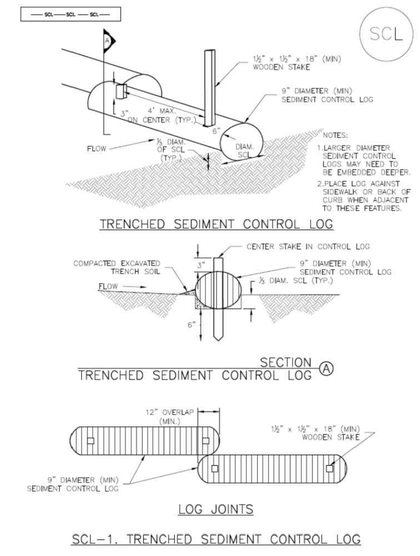
5. REPAIR OR REPLACE SILT FENCE WHEN THERE ARE SIGNS OF WEAR, SUCH AS SAGGING, TEARING, OR COLLAPSE.

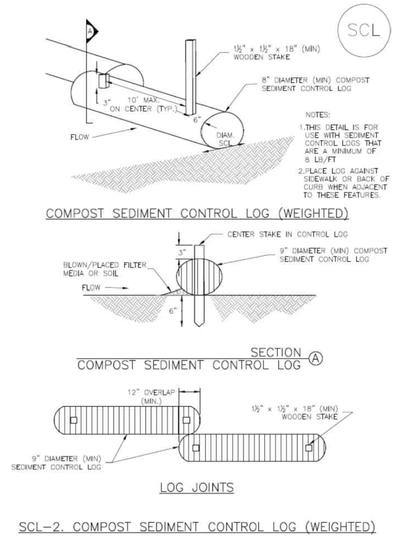
6. SILT FENCE IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION, OR IS REPLACED BY AN EQUIVALENT PERIMETER SEDIMENT CONTROL BMP.

7. WHEN SILT FENCE IS REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO AND CITY OF AURORA, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.





JVA CONSULTING ENGINEERS
47 Cooper Creek Way, Suite 300
Winter Park, CO 80482
jvajva.com
970.722.7677

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

JVA Project No: 3427c

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

DRAWN BY: SAR/ZAB **REVIEWED BY:** CWK/KEV

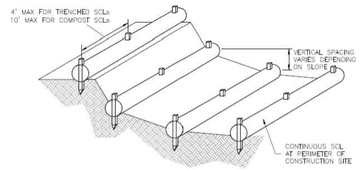
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

EROSION CONTROL DETAILS

CG501

PLOT DATE:

K:\3427c - Granite Street Workforce Housing\Drawings\3427c-DE-ECP-DET-00.dwg, 3/25/2022 - 2:31 PM, ZAB



SCL-3. SEDIMENT CONTROL LOGS TO CONTROL SLOPE LENGTH

SEDIMENT CONTROL LOG INSTALLATION NOTES

1. SEE PLAN VIEW FOR LOCATION AND LENGTH OF SEDIMENT CONTROL LOGS.

2. SEDIMENT CONTROL LOGS THAT ACT AS A PERIMETER CONTROL SHALL BE INSTALLED PRIOR TO ANY UPGRADIENT LAND-DISTURBING ACTIVITIES.

3. SEDIMENT CONTROL LOGS SHALL CONSIST OF STRAW, COMPOST, EXCELSIOR OR COCONUT FIBER, AND SHALL BE FREE OF ANY NOXIOUS WEED SEEDS OR DEFECTS INCLUDING RIPS, HOLES AND OBVIOUS WEAR.

4. SEDIMENT CONTROL LOGS MAY BE USED AS SMALL CHECK DAMS IN DITCHES AND SWALES. HOWEVER, THEY SHOULD NOT BE USED IN PERENNIAL STREAMS.

5. IT IS RECOMMENDED THAT SEDIMENT CONTROL LOGS BE TRENCHED INTO THE GROUND TO A DEPTH OF APPROXIMATELY ⅓ OF THE DIAMETER OF THE LOG. IF TRENCHING TO THIS DEPTH IS NOT FEASIBLE AND/OR DESIRABLE (SHORT TERM INSTALLATION WITH DESIRE NOT TO DAMAGE LANDSCAPE) A LESSER TRENCHING DEPTH MAY BE ACCEPTABLE WITH MORE ROBUST STAKING. COMPOST LOGS THAT ARE 8 LB/FT DO NOT NEED TO BE TRENCHED.

6. THE UPHILL SIDE OF THE SEDIMENT CONTROL LOG SHALL BE BACKFILLED WITH SOIL OR FILTER MATERIAL THAT IS FREE OF ROCKS AND DEBRIS. THE SOIL SHALL BE TIGHTLY COMPACTED INTO THE SHAPE OF A RIGHT TRIANGLE USING A SHOVEL OR WEIGHTED LAWN ROLLER OR BLOWN IN PLACE.

7. FOLLOW MANUFACTURERS' GUIDANCE FOR STAKING. IF MANUFACTURERS' INSTRUCTIONS DO NOT SPECIFY SPACING, STAKES SHALL BE PLACED ON 4' CENTERS AND EMBEDDED A MINIMUM OF 6" INTO THE GROUND. 3" OF THE STAKE SHALL PROTRUDE FROM THE TOP OF THE LOG. STAKES THAT ARE BROKEN PRIOR TO INSTALLATION SHALL BE REPLACED. COMPOST LOGS SHOULD BE STAKED 10' ON CENTER.

SEDIMENT CONTROL LOG MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

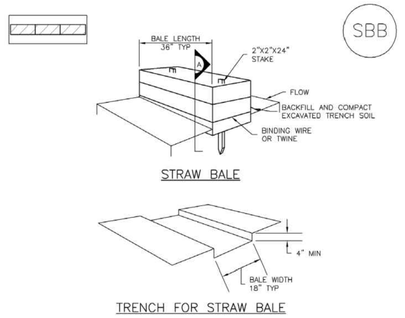
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SEDIMENT ACCUMULATED UPSTREAM OF SEDIMENT CONTROL LOG SHALL BE REMOVED AS NEEDED TO MAINTAIN FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY ½ OF THE HEIGHT OF THE SEDIMENT CONTROL LOG.

5. SEDIMENT CONTROL LOG SHALL BE REMOVED AT THE END OF CONSTRUCTION.COMPOST FROM COMPOST LOGS MAY BE LEFT IN PLACE AS LONG AS BAGS ARE REMOVED AND THE AREA SEEDED. IF DISTURBED AREAS EXIST AFTER REMOVAL, THEY SHALL BE COVERED WITH TOP SOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

(DETAILS ADAPTED FROM TOWN OF PARKER, COLORADO, JEFFERSON COUNTY, COLORADO, DOUGLAS COUNTY, COLORADO, AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.



SBB-1. STRAW BALE

STRAW BALE INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   —LOCATION(S) OF STRAW BALES.

2. STRAW BALES SHALL CONSIST OF CERTIFIED WEED FREE STRAW OR HAY. LOCAL JURISDICTIONS MAY REQUIRE PROOF THAT BALES ARE WEED FREE.

3. STRAW BALES SHALL CONSIST OF APPROXIMATELY 5 CUBIC FEET OF STRAW OR HAY AND WEIGH NOT LESS THAN 35 POUNDS.

4. WHEN STRAW BALES ARE USED IN SERIES AS A BARRIER, THE END OF EACH BALE SHALL BE TIGHTLY ABUTTING ONE ANOTHER.

5. STRAW BALE DIMENSIONS SHALL BE APPROXIMATELY 36"X18"X18".

6. A UNIFORM ANCHOR TRENCH SHALL BE EXCAVATED TO A DEPTH OF 4". STRAW BALES SHALL BE PLACED SO THAT BINDING TWINE IS ENCOMPASSING THE VERTICAL SIDES OF THE BALE(S). ALL EXCAVATED SOIL SHALL BE PLACED ON THE UPHILL SIDE OF THE STRAW BALE(S) AND COMPACTED.

7. TWO (2) WOODEN STAKES SHALL BE USED TO HOLD EACH BALE IN PLACE. WOODEN STAKES SHALL BE 2"X2"X24". WOODEN STAKES SHALL BE DRIVEN 6" INTO THE GROUND.

STRAW BALE MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. STRAW BALES SHALL BE REPLACED IF THEY BECOME HEAVILY SOILED, ROTTEN, OR DAMAGED BEYOND REPAIR.

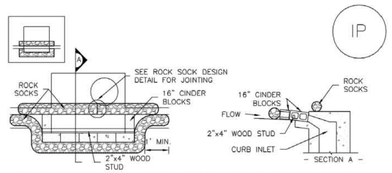
5. SEDIMENT ACCUMULATED UPSTREAM OF STRAW BALE BARRIER SHALL BE REMOVED AS NEEDED TO MAINTAIN FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY ¼ OF THE HEIGHT OF THE STRAW BALE BARRIER.

6. STRAW BALES ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

7. WHEN STRAW BALES ARE REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

(DETAILS ADAPTED FROM TOWN OF PARKER, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.



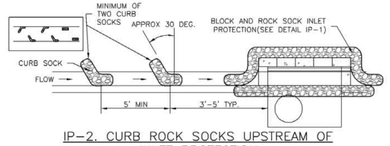
IP-1. BLOCK AND ROCK SOCK SUMP OR ON GRADE INLET PROTECTION

BLOCK AND CURB SOCK INLET PROTECTION INSTALLATION NOTES

1. SEE ROCK SOCK DESIGN DETAIL FOR INSTALLATION REQUIREMENTS.

2. CONCRETE "CINDER" BLOCKS SHALL BE LAID ON THEIR SIDES AROUND THE INLET IN A SINGLE ROW, ABUTTING ONE ANOTHER WITH THE OPEN END FACING AWAY FROM THE CURB.

3. GRAVEL BAGS SHALL BE PLACED AROUND CONCRETE BLOCKS, CLOSELY ABUTTING ONE ANOTHER AND JOINTED TOGETHER IN ACCORDANCE WITH ROCK SOCK DESIGN DETAIL.



IP-2. CURB ROCK SOCKS UPSTREAM OF INLET PROTECTION

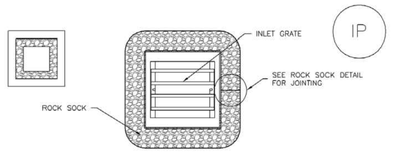
CURB ROCK SOCK INLET PROTECTION INSTALLATION NOTES

1. SEE ROCK SOCK DESIGN DETAIL INSTALLATION REQUIREMENTS.

2. PLACEMENT OF THE SOCK SHALL BE APPROXIMATELY 30 DEGREES FROM PERPENDICULAR IN THE OPPOSITE DIRECTION OF FLOW.

3. SOCKS ARE TO BE FLUSH WITH THE CURB AND SPACED A MINIMUM OF 5 FEET APART.

4. AT LEAST TWO CURB SOCKS IN SERIES ARE REQUIRED UPSTREAM OF ON-GRADE INLETS.

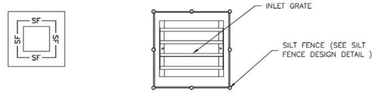


IP-3. ROCK SOCK SUMP/AREA INLET PROTECTION

ROCK SOCK SUMP/AREA INLET PROTECTION INSTALLATION NOTES

1. SEE ROCK SOCK DESIGN DETAIL FOR INSTALLATION REQUIREMENTS.

2. STRAW WATTLES/SEDIMENT CONTROL LOGS MAY BE USED IN PLACE OF ROCK SOCKS FOR INLETS IN PERVIOUS AREAS. INSTALL PER SEDIMENT CONTROL LOG DETAIL.



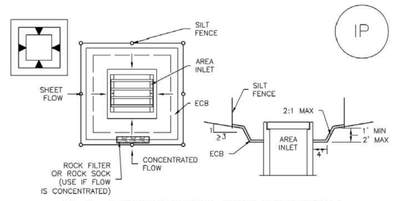
IP-4. SILT FENCE FOR SUMP INLET PROTECTION

SILT FENCE INLET PROTECTION INSTALLATION NOTES

1. SEE SILT FENCE DESIGN DETAIL FOR INSTALLATION REQUIREMENTS.

2. POSTS SHALL BE PLACED AT EACH CORNER OF THE INLET AND AROUND THE EDGES AT A MAXIMUM SPACING OF 3 FEET.

3. STRAW WATTLES/SEDIMENT CONTROL LOGS MAY BE USED IN PLACE OF SILT FENCE FOR INLETS IN PERVIOUS AREAS. INSTALL PER SEDIMENT CONTROL LOG DETAIL.



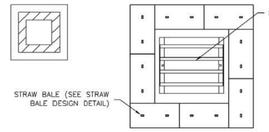
IP-5. OVEREXCAVATION INLET PROTECTION

OVEREXCAVATION INLET PROTECTION INSTALLATION NOTES

1. THIS FORM OF INLET PROTECTION IS PRIMARILY APPLICABLE FOR SITES THAT HAVE NOT YET REACHED FINAL GRADE AND SHOULD BE USED ONLY FOR INLETS WITH A RELATIVELY SMALL CONTRIBUTING DRAINAGE AREA.

2. WHEN USING FOR CONCENTRATED FLOWS, SHAPE BASIN IN 2:1 RATIO WITH LENGTH ORIENTED TOWARDS DIRECTION OF FLOW.

3. SEDIMENT MUST BE PERIODICALLY REMOVED FROM THE OVEREXCAVATED AREA.

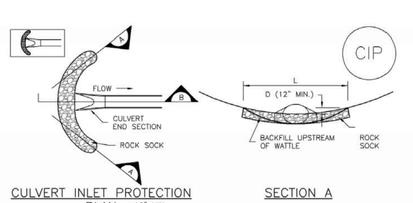


IP-6. STRAW BALE FOR SUMP INLET PROTECTION

STRAW BALE BARRIER INLET PROTECTION INSTALLATION NOTES

1. SEE STRAW BALE DESIGN DETAIL FOR INSTALLATION REQUIREMENTS.

2. BALES SHALL BE PLACED IN A SINGLE ROW AROUND THE INLET WITH ENDS OF BALES TIGHTLY ABUTTING ONE ANOTHER.



CIP-1. CULVERT INLET PROTECTION

CULVERT INLET PROTECTION INSTALLATION NOTES

1. SEE PLAN VIEW FOR
   —LOCATION OF CULVERT INLET PROTECTION.

2. SEE ROCK SOCK DESIGN DETAIL FOR ROCK GRADATION REQUIREMENTS AND JOINTING DETAIL.

CULVERT INLET PROTECTION MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SEDIMENT ACCUMULATED UPSTREAM OF THE CULVERT SHALL BE REMOVED WHEN THE SEDIMENT DEPTH IS ½ THE HEIGHT OF THE ROCK SOCK.

5. CULVERT INLET PROTECTION SHALL REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS PERMANENTLY STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

(DETAILS ADAPTED FROM AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

JVA CONSULTING ENGINEERS
47 Cooper Creek Way, Suite 300
Winter Park, CO 80482
jvajva.com
970.722.7677

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

JVA Project No: 3427c

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

DRAWN BY: SAR/ZAB **REVIEWED BY:** CWK/KEV

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

EROSION CONTROL DETAILS

CG502

PLOT DATE:

K:\3427c - Granite Street Workforce Housing\Drawings\3427c-CE-ECP-DET-00.dwg, 3/25/2022 - 2:31 PM, ZAB

GENERAL INLET PROTECTION INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   –LOCATION OF INLET PROTECTION.
   –TYPE OF INLET PROTECTION (IP.1, IP.2, IP.3, IP.4, IP.5, IP.6)

2. INLET PROTECTION SHALL BE INSTALLED PROMPTLY AFTER INLET CONSTRUCTION OR PAVING IS COMPLETE (TYPICALLY WITHIN 48 HOURS). IF A RAINFALL/RUNOFF EVENT IS FORECAST, INSTALL INLET PROTECTION PRIOR TO ONSET OF EVENT.

3. MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

INLET PROTECTION MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SEDIMENT ACCUMULATED UPSTREAM OF INLET PROTECTION SHALL BE REMOVED AS NECESSARY TO MAINTAIN BMP EFFECTIVENESS, TYPICALLY WHEN STORAGE VOLUME REACHES 50% OF CAPACITY, A DEPTH OF 6" WHEN SILT FENCE IS USED, OR ½ OF THE HEIGHT FOR STRAW BALES.

5. INLET PROTECTION IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS PERMANENTLY STABILIZED, UNLESS THE LOCAL JURISDICTION APPROVES EARLIER REMOVAL OF INLET PROTECTION IN STREETS.

6. WHEN INLET PROTECTION AT AREA INLETS IS REMOVED, THE DISTURBED AREA SHALL BE COVERED WITH TOP SOIL, SEEDED AND MULCHED, OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

NOTE: THE DETAILS INCLUDED WITH THIS FACT SHEET SHOW COMMONLY USED, CONVENTIONAL METHODS OF INLET PROTECTION IN THE DENVER METROPOLITAN AREA. THERE ARE MANY PROPRIETARY INLET PROTECTION METHODS ON THE MARKET. UDFCD NEITHER ENDORSES NOR DISCOURAGES USE OF PROPRIETARY INLET PROTECTION; HOWEVER, IN THE EVENT PROPRIETARY METHODS ARE USED, THE APPROPRIATE DETAIL FROM THE MANUFACTURER MUST BE INCLUDED IN THE SWMP AND THE BMP MUST BE INSTALLED AND MAINTAINED AS SHOWN IN THE MANUFACTURER'S DETAILS.

NOTE: SOME MUNICIPALITIES DISCOURAGE OR PROHIBIT THE USE OF STRAW BALES FOR INLET PROTECTION. CHECK WITH LOCAL JURISDICTION TO DETERMINE IF STRAW BALE INLET PROTECTION IS ACCEPTABLE.

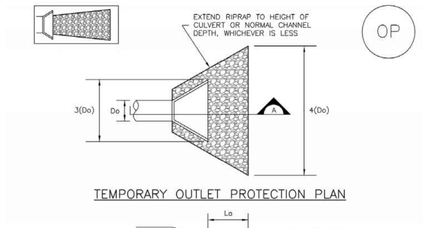


TABLE OP–1. TEMPORARY OUTLET PROTECTION SIZING TABLE			
PIPE DIAMETER, Do (INCHES)	DISCHARGE, Q (CFS)	APRON LENGTH, Lo (FT)	RIPRAP D50 DIAMETER MIN (INCHES)
8	2.5 5	5 10	4 6
12	5 10	10 13	4 6
18	10 20 30 40	10 16 23 26	6 9 12 16
24	30 40 50 60	16 26 26 30	9 9 12 16

OP–1. TEMPORARY OUTLET PROTECTION

TEMPORARY OUTLET PROTECTION INSTALLATION NOTES

1. SEE PLAN VIEW FOR
   –LOCATION OF OUTLET PROTECTION.
   –DIMENSIONS OF OUTLET PROTECTION.

2. DETAIL IS INTENDED FOR PIPES WITH SLOPE ≤ 10%. ADDITIONAL EVALUATION OF RIPRAP SIZING AND OUTLET PROTECTION DIMENSIONS REQUIRED FOR STEEPER SLOPES.

3. TEMPORARY OUTLET PROTECTION INFORMATION IS FOR OUTLETS INTENDED TO BE UTILIZED LESS THAN 2 YEARS.

TEMPORARY OUTLET PROTECTION INSPECTION AND MAINTENANCE NOTES

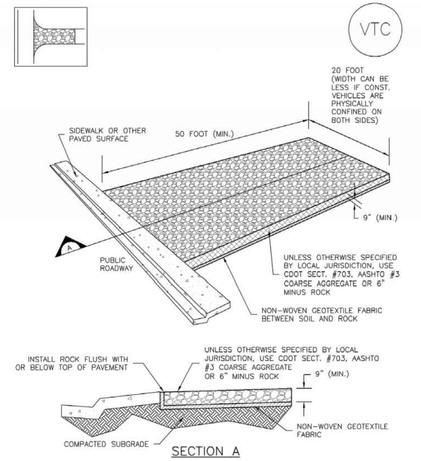
1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

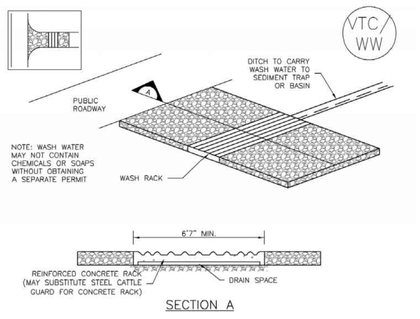
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

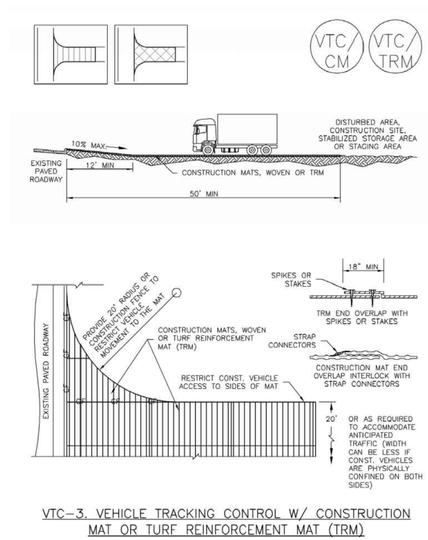
(DETAILS ADAPTED FROM AURORA, COLORADO AND PREVIOUS VERSION OF VOLUME 3, NOT AVAILABLE IN AUTOCAD)



VTC–1. AGGREGATE VEHICLE TRACKING CONTROL



VTC–2. AGGREGATE VEHICLE TRACKING CONTROL WITH WASH RACK



VTC–3. VEHICLE TRACKING CONTROL W/ CONSTRUCTION MAT OR TURF REINFORCEMENT MAT (TRM)

STABILIZED CONSTRUCTION ENTRANCE/EXIT INSTALLATION NOTES

1. SEE PLAN VIEW FOR
   –LOCATION OF CONSTRUCTION ENTRANCE(S)/EXIT(S).
   –TYPE OF CONSTRUCTION ENTRANCE(S)/EXITS(S) (WITH/WITHOUT WHEEL WASH, CONSTRUCTION MAT OR TRM).

2. CONSTRUCTION MAT OR TRM STABILIZED CONSTRUCTION ENTRANCES ARE ONLY TO BE USED ON SHORT DURATION PROJECTS (TYPICALLY RANGING FROM A WEEK TO A MONTH) WHERE THERE WILL BE LIMITED VEHICULAR ACCESS.

3. A STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE LOCATED AT ALL ACCESS POINTS WHERE VEHICLES ACCESS THE CONSTRUCTION SITE FROM PAVED RIGHT–OF–WAYS.

4. STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

5. A NON–WOVEN GEOTEXTILE FABRIC SHALL BE PLACED UNDER THE STABILIZED CONSTRUCTION ENTRANCE/EXIT PRIOR TO THE PLACEMENT OF ROCK.

6. UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF DOT SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6" (MINUS) ROCK.

STABILIZED CONSTRUCTION ENTRANCE/EXIT MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

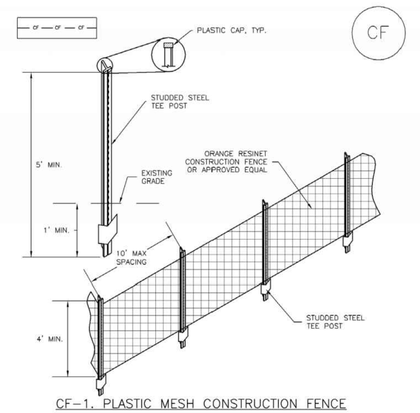
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY TO THE STABILIZED ENTRANCE/EXIT TO MAINTAIN A CONSISTENT DEPTH.

5. SEDIMENT TRACKED ONTO PAVED ROADS IS TO BE REMOVED THROUGHOUT THE DAY AND AT THE END OF THE DAY BY SHOVELING OR SWEEPING. SEDIMENT MAY NOT BE WASHED DOWN STORM SEWER DRAINS.

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

(DETAILS ADAPTED FROM CITY OF BROOMFIELD, COLORADO, NOT AVAILABLE IN AUTOCAD)



CF–1. PLASTIC MESH CONSTRUCTION FENCE

CONSTRUCTION FENCE INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   –LOCATION OF CONSTRUCTION FENCE.

2. CONSTRUCTION FENCE SHOWN SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

3. CONSTRUCTION FENCE SHALL BE COMPOSED OF ORANGE, CONTRACTOR–GRADE MATERIAL THAT IS AT LEAST 4' HIGH. METAL POSTS SHOULD HAVE A PLASTIC CAP FOR SAFETY.

4. STUDDED STEEL TEE POSTS SHALL BE UTILIZED TO SUPPORT THE CONSTRUCTION FENCE. MAXIMUM SPACING FOR STEEL TEE POSTS SHALL BE 10'.

5. CONSTRUCTION FENCE SHALL BE SECURELY FASTENED TO THE TOP, MIDDLE, AND BOTTOM OF EACH POST.

JVA CONSULTING ENGINEERS
47 Cooper Creek Way, Suite 300
Winter Park, CO 80482
jvajva.com
970.722.7677

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

JVA Project No: 3427c

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

DRAWN BY: SAR/ZAB **REVIEWED BY:** CWK/KEV

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

EROSION CONTROL DETAILS

CG503

PLOT DATE:
K:\3427c - Granite Street Workforce Housing\Drawings\3427c-DE-ECP-DET-00.dwg, 3/25/2022 - 2:31 PM, ZAB

CONSTRUCTION FENCE MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

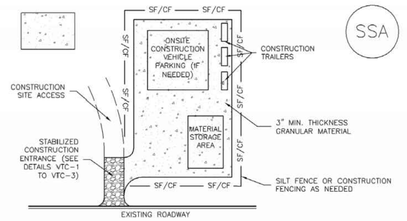
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. CONSTRUCTION FENCE SHALL BE REPAIRED OR REPLACED WHEN THERE ARE SIGNS OF DAMAGE SUCH AS RIPS OR SAGS. CONSTRUCTION FENCE IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

5. WHEN CONSTRUCTION FENCES ARE REMOVED, ALL DISTURBED AREAS ASSOCIATED WITH THE INSTALLATION, MAINTENANCE, AND/OR REMOVAL OF THE FENCE SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED, OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO, NOT AVAILABLE IN AUTOCAD)



SSA–1. STABILIZED STAGING AREA

STABILIZED STAGING AREA INSTALLATION NOTES

1. SEE PLAN VIEW FOR
   –LOCATION OF STAGING AREA(S).
   –CONTRACTOR MAY ADJUST LOCATION AND SIZE OF STAGING AREA WITH APPROVAL FROM THE LOCAL JURISDICTION.

2. STABILIZED STAGING AREA SHOULD BE APPROPRIATE FOR THE NEEDS OF THE SITE. OVERSIZING RESULTS IN A LARGER AREA TO STABILIZE FOLLOWING CONSTRUCTION.

3. STAGING AREA SHALL BE STABILIZED PRIOR TO OTHER OPERATIONS ON THE SITE.

4. THE STABILIZED STAGING AREA SHALL CONSIST OF A MINIMUM 3" THICK GRANULAR MATERIAL.

5. UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF DOT SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6" (MINUS) ROCK.

6. ADDITIONAL PERIMETER BMPs MAY BE REQUIRED INCLUDING BUT NOT LIMITED TO SILT FENCE AND CONSTRUCTION FENCING.

STABILIZED STAGING AREA MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY IF RUTTING OCCURS OR UNDERLYING SUBGRADE BECOMES EXPOSED.

STABILIZED STAGING AREA MAINTENANCE NOTES

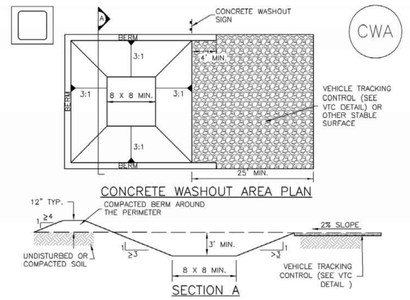
5. STABILIZED STAGING AREA SHALL BE ENLARGED IF NECESSARY TO CONTAIN PARKING, STORAGE, AND UNLOADING/LOADING OPERATIONS.

6. THE STABILIZED STAGING AREA SHALL BE REMOVED AT THE END OF CONSTRUCTION. THE GRANULAR MATERIAL SHALL BE REMOVED OR, IF APPROVED BY THE LOCAL JURISDICTION, USED ON SITE, AND THE AREA COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY LOCAL JURISDICTION.

NOTE: MANY MUNICIPALITIES PROHIBIT THE USE OF RECYCLED CONCRETE AS GRANULAR MATERIAL FOR STABILIZED STAGING AREAS DUE TO DIFFICULTIES WITH RE-ESTABLISHMENT OF VEGETATION IN AREAS WHERE RECYCLED CONCRETE WAS PLACED.

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

(DETAILS ADAPTED FROM DOUGLAS COUNTY, COLORADO, NOT AVAILABLE IN AUTOCAD)



CWA–1. CONCRETE WASHOUT AREA

CWA INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   –CWA INSTALLATION LOCATION.

2. DO NOT LOCATE AN UNLINED CWA WITHIN 400' OF ANY NATURAL DRAINAGE PATHWAY OR WATERBODY. DO NOT LOCATE WITHIN 1,000' OF ANY WELLS OR DRINKING WATER SOURCES. IF SITE CONSTRAINTS MAKE THIS INFEASIBLE, OR IF HIGHLY PERMEABLE SOILS EXIST ON SITE, THE CWA MUST BE INSTALLED WITH AN IMPERMEABLE LINER (16 MIL MIN. THICKNESS) OR SURFACE STORAGE ALTERNATIVES USING PREFABRICATED CONCRETE WASHOUT DEVICES OR A LINED ABOVE GROUND STORAGE ARE SHOULD BE USED.

3. THE CWA SHALL BE INSTALLED PRIOR TO CONCRETE PLACEMENT ON SITE.

4. CWA SHALL INCLUDE A FLAT SUBSURFACE PIT THAT IS AT LEAST 8' BY 8' SLOPES LEADING OUT OF THE SUBSURFACE PIT SHALL BE 3:1 OR FLATTER. THE PIT SHALL BE AT LEAST 3' DEEP.

5. BERM SURROUNDING SIDES AND BACK OF THE CWA SHALL HAVE MINIMUM HEIGHT OF 1'.

6. VEHICLE TRACKING PAD SHALL BE SLOPED 2% TOWARDS THE CWA.

7. SIGNS SHALL BE PLACED AT THE CONSTRUCTION ENTRANCE, AT THE CWA, AND ELSEWHERE AS NECESSARY TO CLEARLY INDICATE THE LOCATION OF THE CWA TO OPERATORS OF CONCRETE TRUCKS AND PUMP RIGS.

8. USE EXCAVATED MATERIAL FOR PERIMETER BERM CONSTRUCTION.

CWA MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. THE CWA SHALL BE REPAIRED, CLEANED, OR ENLARGED AS NECESSARY TO MAINTAIN CAPACITY FOR CONCRETE WASTE. CONCRETE MATERIALS, ACCUMULATED IN PIT, SHALL BE REMOVED ONCE THE MATERIALS HAVE REACHED A DEPTH OF 2'.

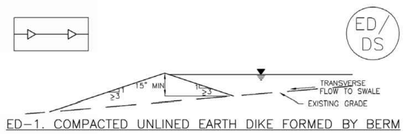
5. CONCRETE WASHOUT WATER, WASTED PIECES OF CONCRETE AND ALL OTHER DEBRIS IN THE SUBSURFACE PIT SHALL BE TRANSPORTED FROM THE JOB SITE IN A WATER-TIGHT CONTAINER AND DISPOSED OF PROPERLY.

6. THE CWA SHALL REMAIN IN PLACE UNTIL ALL CONCRETE FOR THE PROJECT IS PLACED.

7. WHEN THE CWA IS REMOVED, COVER THE DISTURBED AREA WITH TOP SOIL, SEED AND MULCH OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

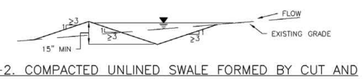
(DETAIL ADAPTED FROM DOUGLAS COUNTY, COLORADO AND THE CITY OF PARKER, COLORADO, NOT AVAILABLE IN AUTOCAD).

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

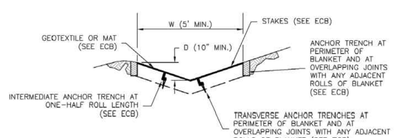


ED–1. COMPACTED UNLINED EARTH DIKE FORMED BY BERM

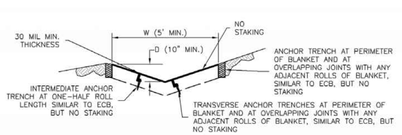
DS–1. COMPACTED UNLINED EXCAVATED SWALE



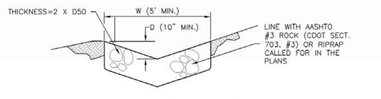
DS–2. COMPACTED UNLINED SWALE FORMED BY CUT AND FILL



DS–3. ECB LINED SWALE (CUT AND FILL OR BERM)



DS–4. SYNTHETIC LINED SWALE



DS–5. RIPRAP LINED SWALE

EARTH DIKE AND DRAINAGE SWALE INSTALLATION NOTES

1. SEE SITE PLAN FOR:
   – LOCATION OF DIVERSION SWALE
   – TYPE OF SWALE (UNLINED, COMPACTED AND/OR LINED).
   – LENGTH OF EACH SWALE.
   – DEPTH, D, AND WIDTH, W DIMENSIONS.
   – FOR ECB/TRM LINED DITCH, SEE ECB DETAIL.
   – FOR RIPRAP LINED DITCH, SIZE OF RIPRAP, D50.

2. SEE DRAINAGE PLANS FOR DETAILS OF PERMANENT CONVEYANCE FACILITIES AND/OR DIVERSION SWALES EXCEEDING 2-YEAR FLOW RATE OR 10 CFS.

3. EARTH DIKES AND SWALES INDICATED ON SWMP PLAN SHALL BE INSTALLED PRIOR TO LAND-DISTURBING ACTIVITIES IN PROXIMITY.

4. EMBANKMENT IS TO BE COMPACTED TO 90% OF MAXIMUM DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT ACCORDING TO ASTM D698.

5. SWALES ARE TO DRAIN TO A SEDIMENT CONTROL BMP.

6. FOR LINED DITCHES, INSTALLATION OF ECB/TRM SHALL CONFORM TO THE REQUIREMENTS OF THE ECB DETAIL.

7. WHEN CONSTRUCTION TRAFFIC MUST CROSS A DIVERSION SWALE, INSTALL A TEMPORARY CULVERT WITH A MINIMUM DIAMETER OF 12 INCHES.

EARTH DIKE AND DRAINAGE SWALE MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SWALES SHALL REMAIN IN PLACE UNTIL THE END OF CONSTRUCTION; IF APPROVED BY LOCAL JURISDICTION, SWALES MAY BE LEFT IN PLACE.

5. WHEN A SWALE IS REMOVED, THE DISTURBED AREA SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY LOCAL JURISDICTION.

(DETAIL ADAPTED FROM DOUGLAS COUNTY, COLORADO AND THE CITY OF COLORADO SPRINGS, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

JVA CONSULTING ENGINEERS
47 Cooper Creek Way, Suite 300
Winter Park, CO 80482
jvajva.com
970.722.7677

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

JVA Project No: 3427c

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

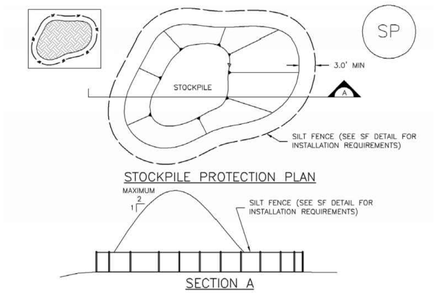
DRAWN BY: SAR/ZAB **REVIEWED BY:** CWK/KEV

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

EROSION CONTROL DETAILS

CG504

K:\3427c - Granite Street Workforce Housing\Drawings\3427c-DE-ECP-DET-00.dwg, 3/25/2022 - 2:32 PM, ZAB
PLOT DATE:



SP-1. STOCKPILE PROTECTION

STOCKPILE PROTECTION INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   –LOCATION OF STOCKPILES.
   –TYPE OF STOCKPILE PROTECTION.

2. INSTALL PERIMETER CONTROLS IN ACCORDANCE WITH THEIR RESPECTIVE DESIGN DETAILS. SILT FENCE IS SHOWN IN THE STOCKPILE PROTECTION DETAILS; HOWEVER, OTHER TYPES OF PERIMETER CONTROLS INCLUDING SEDIMENT CONTROL LOGS OR ROCK SOCKS MAY BE SUITABLE IN SOME CIRCUMSTANCES. CONSIDERATIONS FOR DETERMINING THE APPROPRIATE TYPE OF PERIMETER CONTROL FOR A STOCKPILE INCLUDE WHETHER THE STOCKPILE IS LOCATED ON A PERVIOUS OR IMPERVIOUS SURFACE, THE RELATIVE HEIGHTS OF THE PERIMETER CONTROL AND STOCKPILE, THE ABILITY OF THE PERIMETER CONTROL TO CONTAIN THE STOCKPILE WITHOUT FAILING IN THE EVENT THAT MATERIAL FROM THE STOCKPILE SHIFTS OR SLUMPS AGAINST THE PERIMETER, AND OTHER FACTORS.

3. STABILIZE THE STOCKPILE SURFACE WITH SURFACE ROUGHENING, TEMPORARY SEEDING AND MULCHING, EROSION CONTROL BLANKETS, OR SOIL BINDERS. SOILS STOCKPILED FOR AN EXTENDED PERIOD (TYPICALLY FOR MORE THAN 60 DAYS) SHOULD BE SEEDED AND MULCHED WITH A TEMPORARY GRASS COVER ONCE THE STOCKPILE IS PLACED (TYPICALLY WITHIN 14 DAYS). USE OF MULCH ONLY OR A SOIL BINDER IS ACCEPTABLE IF THE STOCKPILE WILL BE IN PLACE FOR A MORE LIMITED TIME PERIOD (TYPICALLY 30–60 DAYS).

4. FOR TEMPORARY STOCKPILES ON THE INTERIOR PORTION OF A CONSTRUCTION SITE, WHERE OTHER DOWNGRADIENT CONTROLS, INCLUDING PERIMETER CONTROL, ARE IN PLACE, STOCKPILE PERIMETER CONTROLS MAY NOT BE REQUIRED.

STOCKPILE PROTECTION MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

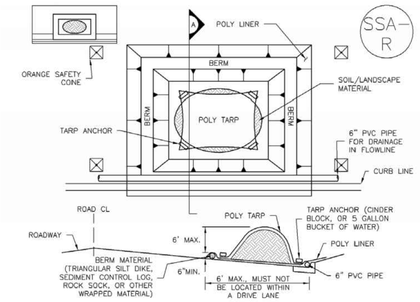
STOCKPILE PROTECTION MAINTENANCE NOTES

4. IF PERIMETER PROTECTION MUST BE MOVED TO ACCESS SOIL STOCKPILE, REPLACE PERIMETER CONTROLS BY THE END OF THE WORKDAY.

5. STOCKPILE PERIMETER CONTROLS CAN BE REMOVED ONCE ALL THE MATERIAL FROM THE STOCKPILE HAS BEEN USED.

(DETAILS ADAPTED FROM PARKER, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.



SP–2. MATERIALS STAGING IN ROADWAY

MATERIALS STAGING IN ROADWAYS INSTALLATION NOTES

1. SEE PLAN VIEW FOR
   –LOCATION OF MATERIAL STAGING AREA(S).
   –CONTRACTOR MAY ADJUST LOCATION AND SIZE OF STAGING AREA WITH APPROVAL FROM THE LOCAL JURISDICTION.

2. FEATURE MUST BE INSTALLED PRIOR TO EXCAVATION, EARTHWORK OR DELIVERY OF MATERIALS.

3. MATERIALS MUST BE STATIONED ON THE POLY LINER. ANY INCIDENTAL MATERIALS DEPOSITED ON PAVED SECTION OR ALONG CURB LINE MUST BE CLEANED UP PROMPTLY.

4. POLY LINER AND TARP COVER SHOULD BE OF SIGNIFICANT THICKNESS TO PREVENT DAMAGE OR LOSS OF INTEGRITY.

5. SAND BAGS MAY BE SUBSTITUTED TO ANCHOR THE COVER TARP OR PROVIDE BERMING UNDER THE BASE LINER.

6. FEATURE IS NOT INTENDED FOR USE WITH WET MATERIAL THAT WILL BE DRAINING AND/OR SPREADING OUT ON THE POLY LINER OR FOR DEMOLITION MATERIALS.

7. THIS FEATURE CAN BE USED FOR:
   –UTILITY REPAIRS.
   –WHEN OTHER STAGING LOCATIONS AND OPTIONS ARE LIMITED.
   –OTHER LIMITED APPLICATION AND SHORT DURATION STAGING.

MATERIALS STAGING IN ROADWAY MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

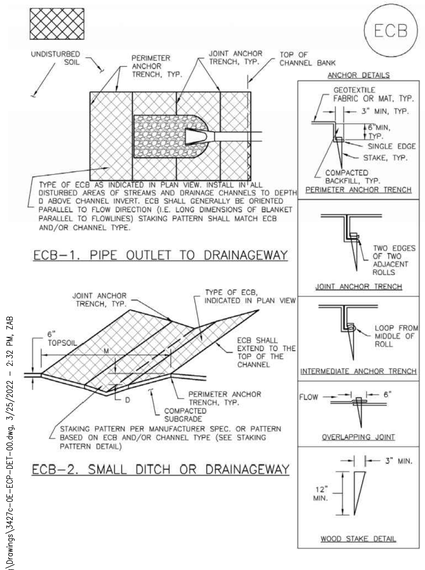
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

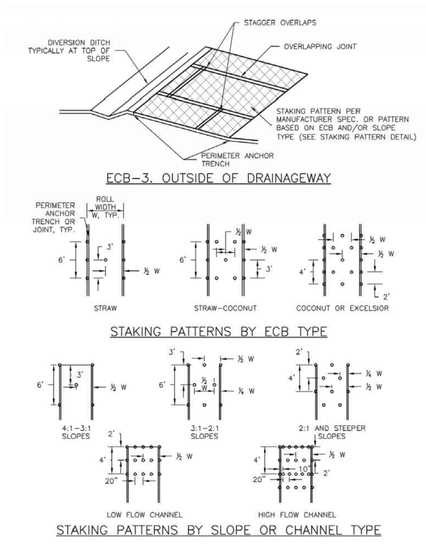
4. INSPECT PVC PIPE ALONG CURB LINE FOR CLOGGING AND DEBRIS. REMOVE OBSTRUCTIONS PROMPTLY.

5. CLEAN MATERIAL FROM PAVED SURFACES BY SWEEPING OR VACUUMING.

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

(DETAILS ADAPTED FROM AURORA, COLORADO)





EROSION CONTROL BLANKET INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   –LOCATION OF ECB.
   –TYPE OF ECB (STRAW, STRAW–COCONUT, COCONUT, OR EXCELSIOR).
   –AREA, A, IN SQUARE YARDS OF EACH TYPE OF ECB.

2. 100% NATURAL AND BIODEGRADABLE MATERIALS ARE PREFERRED FOR RECPs, ALTHOUGH SOME JURISDICTIONS MAY ALLOW OTHER MATERIALS IN SOME APPLICATIONS.

3. IN AREAS WHERE ECBs ARE SHOWN ON THE PLANS, THE PERMITTEE SHALL PLACE TOPSOIL AND PERFORM FINAL GRADING, SURFACE PREPARATION, AND SEEDING AND MULCHING. SUBGRADE SHALL BE SMOOTH AND MOIST PRIOR TO ECB INSTALLATION AND THE ECB SHALL BE IN FULL CONTACT WITH SUBGRADE. NO GAPS OR VOIDS SHALL EXIST UNDER THE BLANKET.

4. PERIMETER ANCHOR TRENCH SHALL BE USED ALONG THE OUTSIDE PERIMETER OF ALL BLANKET AREAS.

5. JOINT ANCHOR TRENCH SHALL BE USED TO JOIN ROLLS OF ECBs TOGETHER (LONGITUDINALLY AND TRANSVERSELY) FOR ALL ECBs EXCEPT STRAW WHICH MAY USE AN OVERLAPPING JOINT.

6. INTERMEDIATE ANCHOR TRENCH SHALL BE USED AT SPACING OF ONE–HALF ROLL LENGTH FOR COCONUT AND EXCELSIOR ECBs.

7. OVERLAPPING JOINT DETAIL SHALL BE USED TO JOIN ROLLS OF ECBs TOGETHER FOR ECBs ON SLOPES.

8. MATERIAL SPECIFICATIONS OF ECBs SHALL CONFORM TO TABLE ECB–1.

9. ANY AREAS OF SEEDING AND MULCHING DISTURBED IN THE PROCESS OF INSTALLING ECBS SHALL BE RESEEDED AND MULCHED.

10. DETAILS ON DESIGN PLANS FOR MAJOR DRAINAGEWAY STABILIZATION WILL GOVERN IF DIFFERENT FROM THOSE SHOWN HERE.

TABLE ECB–1. ECB MATERIAL SPECIFICATIONS

TYPE	COCONUT CONTENT	STRAW CONTENT	EXCELSIOR CONTENT	RECOMMENDED NETTING**
STRAW*	–	100%	–	DOUBLE/ NATURAL
STRAW–COCONUT	30% MIN	70% MAX	–	DOUBLE/ NATURAL
COCONUT	100%	–	–	DOUBLE/ NATURAL
EXCELSIOR	–	–	100%	DOUBLE/ NATURAL

*STRAW ECBs MAY ONLY BE USED OUTSIDE OF STREAMS AND ORANACE CHANNEL.
**ALTERNATE NETTING MAY BE ACCEPTABLE IN SOME JURISDICTIONS

EROSION CONTROL BLANKET MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. ECBs SHALL BE LEFT IN PLACE TO EVENTUALLY BIODEGRADE, UNLESS REQUESTED TO BE REMOVED BY THE LOCAL JURISDICTION.

5. ANY ECB PULLED OUT, TORN, OR OTHERWISE DAMAGED SHALL BE REPAIRED OR REINSTALLED. ANY SUBGRADE AREAS BELOW THE GEOTEXTILE THAT HAVE ERODED TO CREATED A VOID UNDER THE BLANKET, OR THAT REMAIN DEVOID OF GRASS SHALL BE REPAIRED, RESEEDED AND MULCHED AND THE ECB REINSTALLED.

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

(DETAILS ADAPTED FROM DOUGLAS COUNTY, COLORADO AND TOWN OF PARKER COLORADO, NOT AVAILABLE IN AUTOCAD)

JVA CONSULTING ENGINEERS
47 Cooper Creek Way, Suite 300
Winter Park, CO 80482
jvajva.com
970.722.7677

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

JVA Project No: 3427c

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

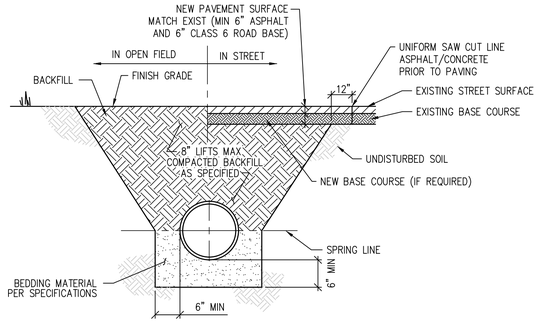
DRAWN BY: SAR/ZAB **REVIEWED BY:** CWK/KEV

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

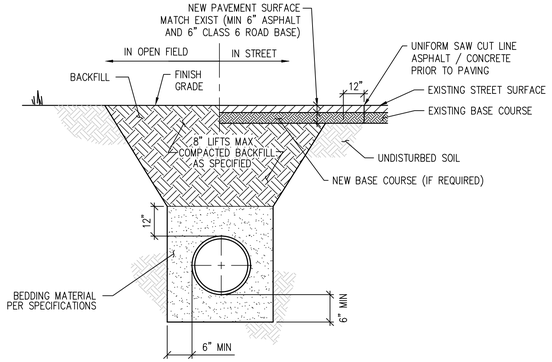
EROSION CONTROL DETAILS

CG505

K:\3427c - Granite Street Workforce Housing\Drawings\3427c-DE-ECP-DET-00.dwg, 3/25/2022 - 2:32 PM, ZAB
PLOT DATE:



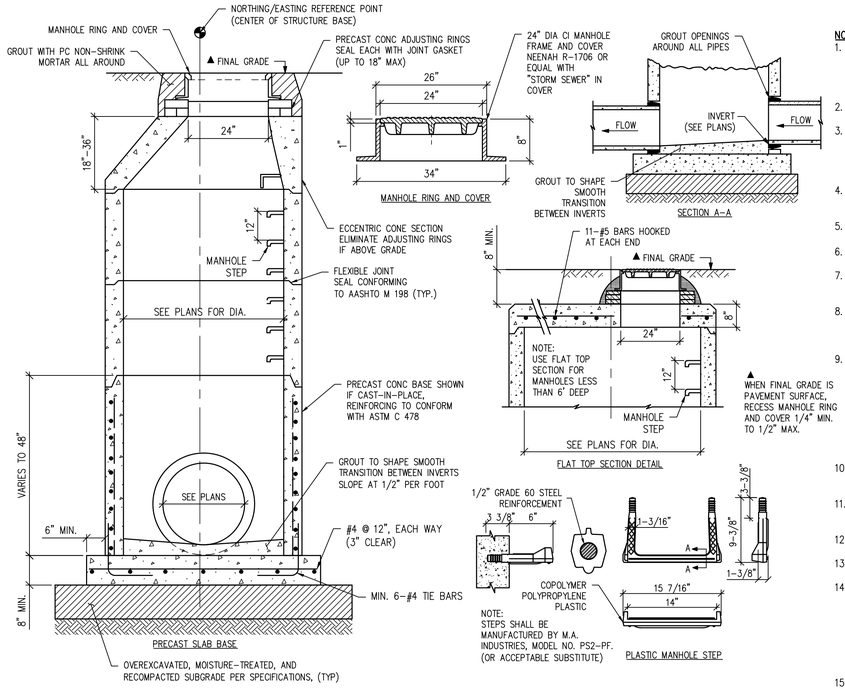
REINFORCED CONCRETE PIPE



CMP/PVC/HDPE PIPE (SEE PLANS FOR MATERIAL)

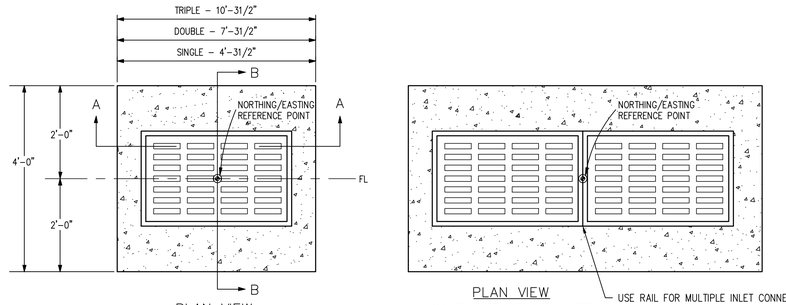
NOTES:
1. IF UNSTABLE MATERIALS ARE FOUND IN TRENCH, OVEREXCAVATED PER SPECIFICATIONS OR AS REQUIRED.
2. TRENCH TO BE BRACED OR SHEETED AS NECESSARY FOR THE SAFETY OF THE WORKERS AND THE PROTECTION OF OTHER UTILITIES.
3. MINIMUM COVER IS 18" BELOW FINISHED GRADE.

STORM SEWER PIPE BEDDING DETAIL
NTS — 2 / CG103



NOTES:
1. SINCE ALL PIPE ENTRIES INTO THE BASE ARE VARIABLE, THE DIMENSIONS SHOWN ARE TYPICAL. ACTUAL DIMENSIONS AND QUANTITIES FOR CONCRETE AND REINFORCEMENT SHALL BE AS REQUIRED IN THE WORK.
2. THE PRECAST FLAT TOP MAY BE USED ON ANY MANHOLE.
3. THE MANHOLE RING FRAME SHALL BE SET IN A BED OF GROUT. THE FRAME SHALL BE SURROUNDED WITH A CEMENT GROUT IN UNPAVED AREA, OR A CONCRETE COLLAR IN PAVED AREA. SEE DETAILS ON SHEETS 2 AND 3.
4. DESIGN OF BOX BASE IS BASED ON STRAIGHT RUNS OF PIPE OR CHANGE IN DIRECTION OF LESS THAN 45°. SPECIAL DESIGN IS REQUIRED FOR 45° OR GREATER.
5. PRECAST MANHOLES AND REINFORCEMENT SHALL CONFORM TO AASHTO M 199 (ASTM C 478).
6. CAST-IN-PLACE MANHOLES SHALL BE CLASS B CONCRETE.
7. STEPS SHALL BE REQUIRED WHEN THE MANHOLE DEPTH EXCEEDS 3 FT.-6 IN. AND SHALL CONFORM TO AASHTO M 199.
8. ALL REINFORCING STEEL SHALL BE GRADE 60 AND EPOXY COATED. VERTICAL STEEL SHALL BE PLACED AT CENTERLINE OF WALL. ALL BARS SHALL HAVE A 2 IN. MINIMUM CLEARANCE.
9. ALL PIPE ENTRIES INTO THE BASE OF MANHOLE SHALL BE CONNECTED BY OPEN CHANNELIZATION ADJUSTED FOR PIPE SIZE, SHAPE, SLOPE, AND DIRECTION OF FLOW. DETAILS SHOWN ARE TYPICAL FOR INSTALLATIONS WITH ALL INVERTS OF SAME RELATIVE ELEVATION. FOR EXCESSIVE ELEVATION DIFFERENCE BETWEEN INVERTS, SPECIAL BASE/CHANNEL DETAILS WILL BE SHOWN ON THE PLANS.
10. FLOW CHANNELS AND INVERTS SHALL BE FORMED BY SHAPING WITH CLASS B CONCRETE OR APPROVED GROUT.
11. STUB-OUTS SHALL EXTEND 2 FT. MINIMUM BEYOND OUTSIDE WALL SURFACE OF MANHOLE AND BE SATISFACTORILY PLUGGED.
12. THE SLOPE OF THE MANHOLE COVER SHALL MATCH THE ROADWAY PROFILE AND CROSS SLOPE.
13. BASE SLABS SHALL BE POURED MONOLITHICALLY WITH BOTTOM RISER SECTION.
14. PRECAST MANHOLE BASES SHALL FIT THE CONDITIONS AND LOCATIONS FOR WHICH THEY ARE INTENDED WITHOUT ANY FIELD MODIFICATIONS. ANY MANHOLE BASE WHICH REQUIRES FIELD CUTTING OR MODIFICATION IN ORDER TO FIT THE LOCATIONS INTENDED WILL BE REJECTED BY THE ENGINEER AND REMOVED AND REPLACED BY THE CONTRACTOR AT NO COST TO THE OWNER.
15. FOR FULL DETAIL, SEE CDOT DETAIL M-604-20.

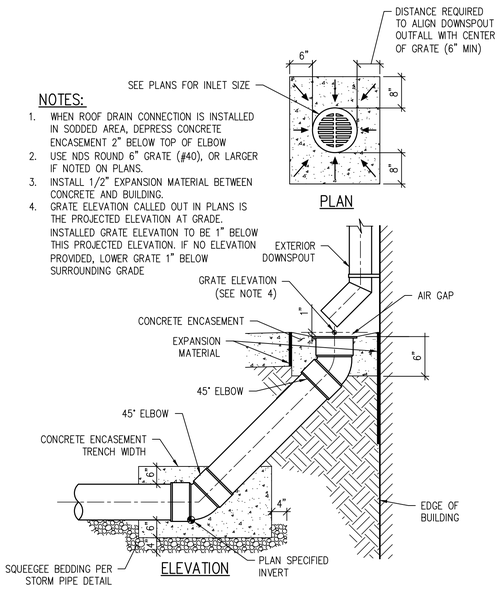
STORM MANHOLE DETAIL
NTS — 1 / CG103



PLAN VIEW
SINGLE TYPE 13 INLET

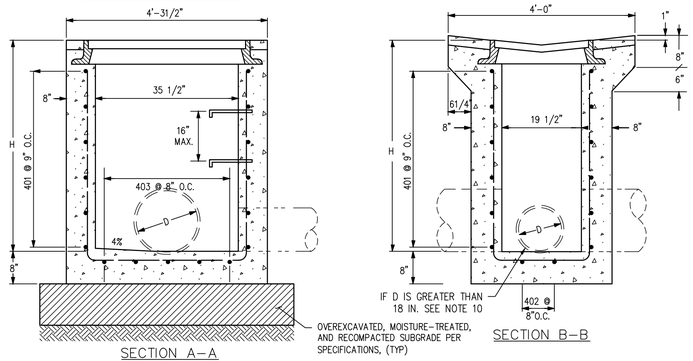
PLAN VIEW
DOUBLE TYPE 13 INLET

RAIL DETAIL



NOTES:
1. WHEN ROOF DRAIN CONNECTION IS INSTALLED IN SODDED AREA, DEPRESS CONCRETE ENCASEMENT 2" BELOW TOP OF ELBOW
2. USE NDS ROUND 6" GRATE (#40), OR LARGER IF NOTED ON PLANS.
3. INSTALL 1/2" EXPANSION MATERIAL BETWEEN CONCRETE AND BUILDING.
4. GRATE ELEVATION CALLED OUT IN PLANS IS THE PROJECTED ELEVATION AT GRADE. INSTALLED GRATE ELEVATION TO BE 1" BELOW THIS PROJECTED ELEVATION. IF NO ELEVATION PROVIDED, LOWER GRATE 1" BELOW SURROUNDING GRADE

EXTERIOR DOWNSPOUT ROOF DRAIN CONNECTION
NTS — 4 / CG103



SECTION A-A

SECTION B-B

NOTES:
1. CONCRETE SHALL BE CLASS B. INLET MAY BE CAST-IN-PLACE OR PRECAST.
2. CAST-IN-PLACE CONCRETE WALLS SHALL BE FORMED ON BOTH SIDES.
3. EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED 3/4 IN.
4. REINFORCING BARS SHALL BE DEFORMED #4 AND SHALL HAVE A 2 IN. MINIMUM CLEARANCE. ALL REINFORCING BARS SHALL BE EPOXY COATED.
5. STEPS SHALL BE PROVIDED WHEN INLET DIMENSION "H" IS EQUAL TO OR GREATER THAN 3 FT.-6 IN. AND SHALL CONFORM TO AASHTO M 199.
6. ALL GRATES AND FRAMES SHALL BE GRAY OR DUCTILE CAST IRON IN ACCORDANCE WITH SUBSECTION 712.06. GRATES AND FRAMES SHALL BE DESIGNED TO WITHSTAND HS 20 LOADING.
7. STATION POINT IS AT THE CENTER OF THE INLET.
8. GRATE SHALL HAVE "DUMP NO WASTE DRAINS TO STREAM" MESSAGE CAST ON SURFACE.
9. FOR FULL DETAIL INCLUDING BAR LIST, DIMENSIONS AND QTY. TABLE, SEE CDOT DETAIL M-604-13
10. ALL CONNECTED PIPES WITH A DIAMETER (D) GREATER THAN 30" FRONT AND 18" SIDE AND/OR ENTERING AT AN ANGLE GREATER THAN 80° A CUSTOM CONC BOX MUST BE CONSTRUCTED. CONTRACTOR TO COORDINATE BOX DIMENSIONS AND SPECS WITH MANUFACTURER.

VALLEY INLET DETAIL
NTS — 3 / CG103

JVA CONSULTING ENGINEERS
47 Cooper Creek Way, Suite 300
Winter Park, CO 80482
jvajva.com
970.722.7677

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

JVA Project No: 3427c

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

DRAWN BY: SAR/ZAB **REVIEWED BY:** CWK/KEV

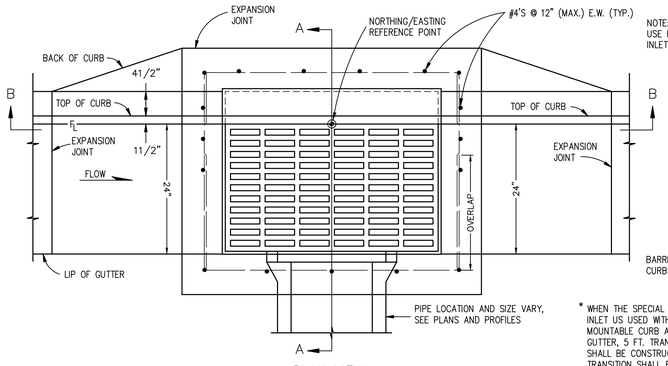
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

DRAINAGE DETAILS

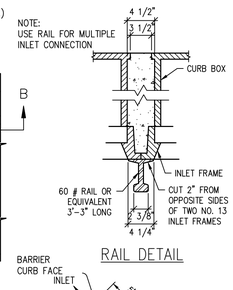
CG506

K:\3427c - Granite Street Workforce Housing\Drawings\3427c-01-GRP-DET-01.dwg, 3/25/2022 - 2:32 PM, ZAB

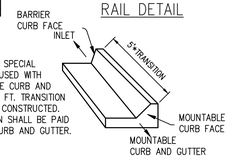
PLOT DATE: 5/19/2021 1:20:59 PM



PLAN VIEW

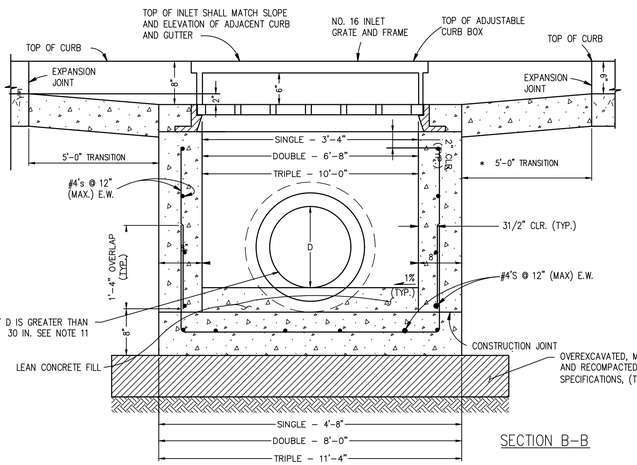


RAIL DETAIL

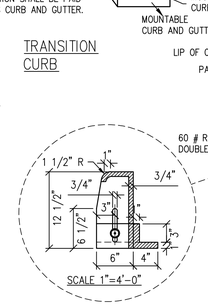


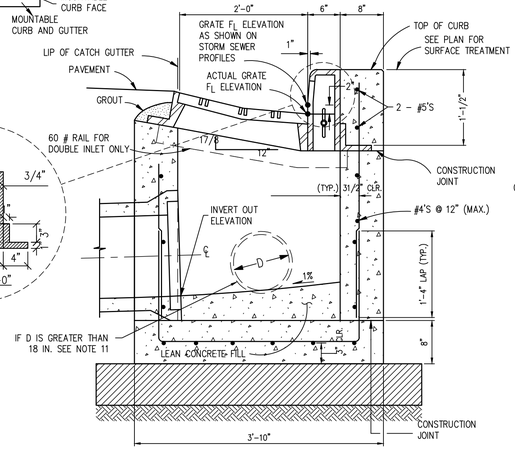
* WHEN THE SPECIAL INLET US USED WITH MOUNTABLE CURB AND GUTTER, 5 FT. TRANSITION SHALL BE CONSTRUCTED. TRANSITION SHALL BE PAID FOR AS CURB AND GUTTER.

TRANSITION CURB



SECTION B-B





SECTION A-A

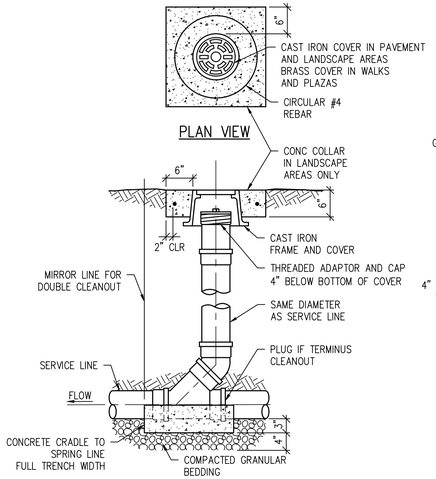
COMBINATION INLET DETAIL

NTS

9 CG103

NOTES:

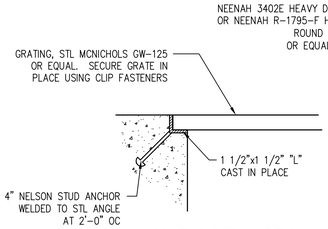
1. ALL CASTING SHALL CONFORM TO ASTM A-48(C1 35b) WITH A MINIMUM STRENGTH OF 35 ksi.
2. ALL CASTINGS SHALL BE HEAVY DUTY, AND CAPABLE OF WITHSTANDING AASHTO H20 LOADING.
3. FLOOR SLOPE MAY BE POURED MONOLITHIC WITH BASE.
4. ALL REINFORCING STEEL SHALL BE ASTM, A-615, GRADE 60 DEFORMED BARS. DIAMETER OF BEND MEASURED ON THE INSIDE OF THE BAR SHALL BE A MINIMUM OF 6 BAR DIAMETER.
5. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS APPLICABLE TO THE PROJECT.
6. CONCRETE SHALL HAVE A 28 DAY STRENGTH OF 4000 PSI.
7. SUBGRADE SHALL HAVE A GRADATION EQUAL TO CLASS B BEDDING COMPACTED TO 100% MAXIMUM DRY DENSITY, AASHTO T-99.
8. NO FORMWORK SHALL REMAIN INSIDE STRUCTURE WHEN COMPLETE.
9. INLET WALLS SHALL BE FORMED BOTH INSIDE AND OUTSIDE. CASTING OF SIDEWALLS AGAINST EARTH IS NOT PERMITTED.
10. LEAN CONCRETE FILL TO BE f' = 2000 PSI.
11. ALL CONNECTED PIPES WITH A DIAMETER (D) GREATER THAN 30" FRONT AND 18" SIDE AND/OR ENTERING AT AN ANGLE GREATER THAN 80° A CUSTOM CONC BOX MUST BE CONSTRUCTED. CONTRACTOR TO COORDINATE BOX DIMENSIONS AND SPECS WITH MANUFACTURER.



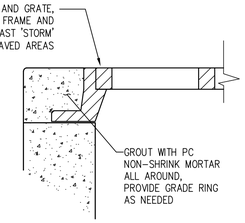
STORM CLEANOUT DETAIL

NTS

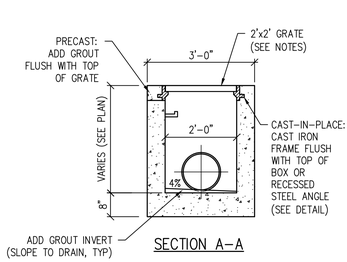
6 CG103



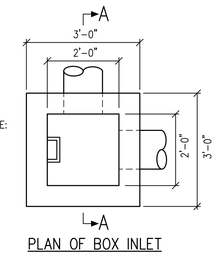
GRATING DETAIL FIELD



GRATING/LID DETAIL PAVEMENT



SECTION A-A



PLAN OF BOX INLET

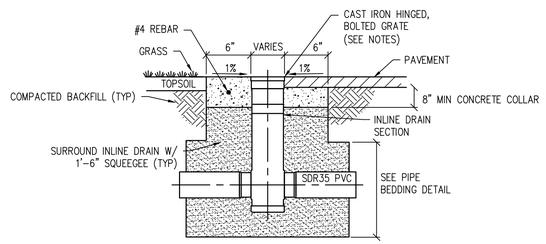
NOTES:

1. CONCRETE SHALL BE CDOT CLASS B. INLET MAY BE CAST-IN-PLACE OR PRECAST AND SHALL CONFORM TO ASTM C478. PRECAST BOX IS SHOWN.
2. CAST-IN-PLACE CONCRETE WALLS SHALL BE 6" MIN THICKNESS WITH 3/4" CHAMFERED EDGES.
3. ALL WALLS AND BASE SHALL BE REINFORCED WITH #4'S @ 8" OC EACH WAY. REINFORCING BARS SHALL BE DEFORMED AND SHALL HAVE A 2" MIN CLEARANCE.
4. WHERE INLET IS INSTALLED IN TRAFFIC AREAS, ALL GRATES AND FRAMES SHALL BE GRAY OR DUCTILE CAST IRON CONFORMING TO CDOT 712.06. GRATES AND FRAMES SHALL BE DESIGNED TO WITHSTAND HS20 LOADING.
5. USE NEENAH 3402E CAST GRATING OR ACCEPTED SUBSTITUTE.
6. SEE PLAN FOR LOCATION AND SIZE OF PIPE. WHERE INLET IS INSTALLED IN PEDESTRIAN AREAS, A PEDESTRIAN/ADA GRATE SHALL BE USED (MAX 1/4" OPEN SPACING, IRONSMITH GRAY CAST GRATE 9032DR-24, McNICHOLS GCM-1-125 METAL BAR GRATING W/ CLIPS, OR ACCEPTED SUBSTITUTE)
7. WHEN CONCRETE OR BITUMINOUS PAVING IS TO EXTEND TO THE EDGE OF THE INLET, USE NEENAH 3402E HEAVY DUTY FRAME AND GRATE, OR NEENAH R-1795-F HEAVY DUTY FRAME AND ROUND SOLID LID CAST 'STORM' OR EQUAL, REFER TO PLANS.
8. PROVIDED EMBEDDED PLASTIC LADDER STEPS AT 18" VERTICAL SPACING FOR INLETS DEEPER THAN 4'. SEE PLASTIC STEP DETAIL.

2'x2' INLET DETAIL

NTS

5 CG103



8" TO 30" NYLOPLAST DRAIN

(SEE PLANS FOR SIZE)

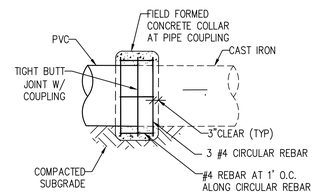
NOTES:

1. AREA DRAIN COVER TO BE NYLOPLAST CAST HS-20 RATED BOLTED AND HINGED GRATE OR APPROVED EQUAL IN TRAFFIC AREAS.
2. AREA DRAIN INLETS IN PEDESTRIAN AREAS SHALL BE INSTALLED WITH PEDESTRIAN RATED GRATES (1/4" MAX OPENING, TYPICAL).

AREA DRAIN DETAIL

NTS

8 CG103



REINFORCED CONCRETE COLLAR

NTS

7 CG103

CONSULTING ENGINEERS

JVA CONSULTING ENGINEERS
47 Cooper Creek Way, Suite 300
Winter Park, CO 80482
jvajva.com
970.722.7677

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

JVA Project No: 3427c

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

DRAWN BY: SAR/ZAB **REVIEWED BY:** CWK/KEV

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

DRAINAGE DETAILS

CG507

K:\3427c - Granite Street Workforce Housing\Drawings\3427c-01-GRP-DET-01.dwg, 3/25/2022 - 2:32 PM, ZAB

PLOT DATE: 5/19/2021 1:20:59 PM

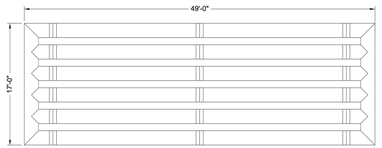
PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 304 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = 955 CF
- PIPE STORAGE VOLUME = 955 CF
- BACKFILL STORAGE VOLUME = 0 CF
- TOTAL STORAGE PROVIDED = 955 CF

PIPE DETAILS
- DIAMETER = 24"
- CORRUGATION = 2 2/3x1/2
- GAGE = 16
- COATING = ALT2
- WALL TYPE = SOLID
- BARREL SPACING = 12"

BACKFILL DETAILS
- WIDTH AT ENDS = 12"
- ABOVE PIPE = 0"
- WIDTH AT SIDES = 12"
- BELOW PIPE = 0"



ASSEMBLY
SCALE: 1" = 10'

NOTES

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE. ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE 2⅔" x ½" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.
- BAND TYPE TO BE DETERMINED UPON FINAL DESIGN.
- THE PROJECT SUMMARY IS REFLECTIVE OF THE DYODS DESIGN. QUANTITIES ARE APPROX. AND SHOULD BE VERIFIED UPON FINAL DESIGN AND APPROVAL. FOR EXAMPLE, TOTAL EXCAVATION DOES NOT CONSIDER ALL VARIABLES SUCH AS SHORING AND ONLY ACCOUNTS FOR MATERIAL WITHIN THE ESTIMATED EXCAVATION FOOTPRINT.
- THESE DRAWINGS ARE FOR CONCEPTUAL PURPOSES AND DO NOT REFLECT ANY LOCAL PREFERENCES OR REGULATIONS. PLEASE CONTACT YOUR LOCAL CONTECH REP FOR MODIFICATIONS.

OUTLET CONTROL STRUCTURE

WQCV = 653 CF
WQCV RELEASE RATE = 40-HOUR DRAIN

25-YR DETENTION VOLUME = 302 CF
TOTAL DETENTION VOLUME OF WQCV AND 25-YR = 955 CF
25-YR RELEASE TAE = 0.50 CFS

*100-YR DETENTION VOLUME IS LESS THAN 25-YR REQUIREMENT AND DOES NOT NECESSITATE ADDITIONAL VOLUME.
100-YR RELEASE RATE = 1.07 CFS

**OUTLET STRUCTURE TO PROVIDE OVERFLOW THROUGH STRUCTURE TO PREVENT SURCHARGING.

The design and information shown on this drawing is provided as a service to the project owner, engineer and contractor by Contech Engineered Solutions LLC ("Contech"). Neither this drawing, nor any part thereof, may be used, reproduced or modified in any manner without the prior written consent of Contech. Failure to comply is done at the user's own risk and Contech expressly disclaims any liability or responsibility for such use.

If discrepancies between the supplied information upon which this drawing is based and the actual field conditions are encountered as site work progresses, these discrepancies must be reported to Contech immediately for re-evaluation of the design. Contech accepts no liability for designs based on missing, incomplete or inaccurate information supplied by others.

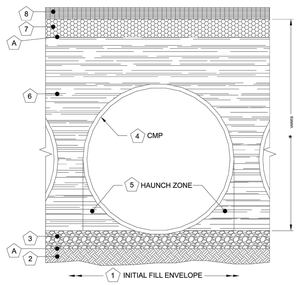
DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH CMP DETENTION SYSTEMS
CONTECH DYOD5 DRAWING

DYO14738 3427c Granite Street
DETENTION SYSTEM
Frisco, CO
DETENTION SYSTEM

PROJECT No.: 4750	SEQ. No.: 14738	DATE: 3/21/2022
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		



DETENTION SYSTEMS - CMP DETENTION / CMP DRAINAGE

	Material Location	Description	Material Designation	Designation
8	Rigid or Flexible Pavement (if applicable)			
7	Road Base (if applicable)			
A	Geotextile Layer	Non-Woven Geotextile	CONTECH C-40 or C-45	Engineer Decision for consideration to prevent soil migration into varying soil types
6	Backfill	Well graded granular material which may contain small amounts of silt or clay.	AASHTO M 145- A-1, A-2, A-3	Placed in 8"+/- loose lifts and compacted to 90% Standard Proctor Per AASHTO T 99
3	Bedding Stone	Well graded granular bedding material w/maximum particle size of 3"	AASHTO M43 - 3,357,4,467, 5, 56, 57	Engineer to determine if bedding is required. Pipe may be placed on the trench bottom of a relatively loose, native suitable well graded & granular material. For Arch pipes it is recommended to be shaped to a relatively flat bottom or fine-grade the foundation to a slight v-shape. Unsuitable material should be over-excavated and re-placed with a 4"-6" layer of well graded & granular stone per the material designation. See AASHTO 26.3.8.1 / 26.5.3 Bedding info.
A	Geotextile Layer	Non-Woven Geotextile	CONTECH C-40 or C-45	Engineer Decision for consideration to prevent soil migration into varying soil types

Note: Backfill using controlled low-strength material (CLSM, "flash fill" or "flowable fill") when the spacing between the pipes will not allow for placement and adequate compaction of the backfill.

1 MINIMUM WIDTH DEPENDS ON SITE CONDITIONS AND ENGINEERING JUDGEMENT

FOUNDATION/BEDDING PREPARATION

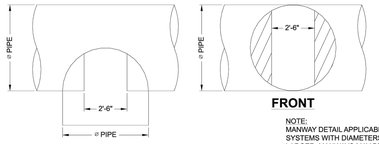
2 PRIOR TO PLACING THE BEDDING, THE FOUNDATION MUST BE CONSTRUCTED TO A UNIFORM AND STABLE GRADE. IN THE EVENT THAT UNSUITABLE FOUNDATION MATERIALS ARE ENCOUNTERED DURING EXCAVATION, THEY SHALL BE REMOVED AND BROUGHT BACK TO THE GRADE WITH A FILL MATERIAL AS APPROVED BY THE ENGINEER.

5 HAUNCH ZONE MATERIAL SHALL BE PLACED AND UNIFORMALLY COMPACTED WITHOUT SOFT SPOTS.

BACKFILL

WHEN PLACING THE FIRST LIFTS OF BACKFILL IT IS IMPORTANT TO MAKE SURE THAT THE BACKFILL IS PROPERLY COMPACTED UNDER AND AROUND THE PIPE HAUNCHES. BACKFILL SHALL BE PLACED SUCH THAT THERE IS NO MORE THAN A TWO LIFT (16") DIFFERENTIAL BETWEEN ANY OF THE PIPES AT ANY TIME DURING THE BACKFILL PROCESS. THE BACKFILL SHALL BE ADVANCED ALONG THE LENGTH OF THE DETENTION SYSTEM AT THE SAME RATE TO AVOID DIFFERENTIAL LOADING ON THE PIPE.

OTHER ALTERNATE BACKFILL MATERIAL MAY BE ALLOWED DEPENDING ON SITE SPECIFIC CONDITIONS, AS APPROVED BY SITE ENGINEER.



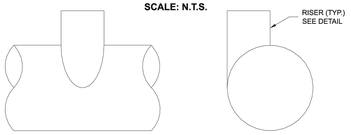
FRONT

PLAN

TYPICAL MANWAY DETAIL

SCALE: N.T.S.

NOTE:
MANWAY DETAIL APPLICABLE FOR CMP SYSTEMS WITH DIAMETERS 48" AND LARGER. MANWAYS MAY BE REQUIRED ON SMALLER SYSTEMS DEPENDING ON ACTUAL SITE SPECIFIC CONDITIONS.



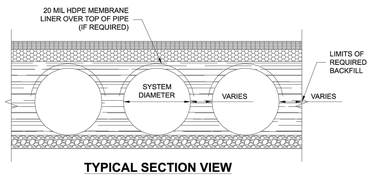
ELEVATION

END

NOTE:
LADDERS ARE OPTIONAL AND ARE NOT REQUIRED FOR ALL SYSTEMS.

TYPICAL RISER DETAIL

SCALE: N.T.S.



TYPICAL SECTION VIEW

LINER OVER ROWS
SCALE: N.T.S.

NOTE: IF SALTING AGENTS FOR SNOW AND ICE REMOVAL ARE USED ON OR NEAR THE PROJECT, AN HDPE MEMBRANE LINER IS RECOMMENDED WITH THE SYSTEM. THE IMPERMEABLE LINER IS INTENDED TO HELP PROTECT THE SYSTEM FROM THE POTENTIAL ADVERSE EFFECTS THAT MAY RESULT FROM A CHANGE IN THE SURROUNDING ENVIRONMENT OVER A PERIOD OF TIME. PLEASE REFER TO THE CORRUGATED METAL PIPE DETENTION DESIGN GUIDE FOR ADDITIONAL INFORMATION.

The design and information shown on this drawing is provided as a service to the project owner, engineer and contractor by Contech Engineered Solutions LLC ("Contech"). Neither this drawing, nor any part thereof, may be used, reproduced or modified in any manner without the prior written consent of Contech. Failure to comply is done at the user's own risk and Contech expressly disclaims any liability or responsibility for such use.

If discrepancies between the supplied information upon which this drawing is based and the actual field conditions are encountered as site work progresses, these discrepancies must be reported to Contech immediately for re-evaluation of the design. Contech accepts no liability for designs based on missing, incomplete or inaccurate information supplied by others.

DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH CMP DETENTION SYSTEMS
CONTECH DYOD5 DRAWING

DYO14738 3427c Granite Street
DETENTION SYSTEM
Frisco, CO
DETENTION SYSTEM

PROJECT No.: 4750	SEQ. No.: 14738	DATE: 3/21/2022
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

JVA CONSULTING ENGINEERS
47 Cooper Creek Way, Suite 300
Winter Park, CO 80482
jvajva.com
970.722.7677

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

JVA Project No: 3427c

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

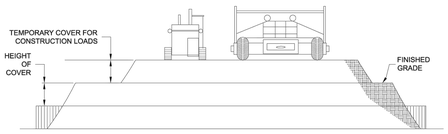
DRAWN BY: SAR/ZAB **REVIEWED BY:** CWK/KEV

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

UNDERGROUND DETENTION DETAILS

CG508

PLOT DATE: 5/19/2021 1:20:59 PM
K:\3427c - Granite Street Workforce Housing\Drawings\3427c-01-CGP-DET-01.dwg, 3/25/2022 - 2:32 PM, ZAB



CONSTRUCTION LOADS

FOR TEMPORARY CONSTRUCTION VEHICLE LOADS, AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER THE TOP OF THE PIPE. THE HEIGHT-OF-COVER SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THE TABLE BELOW. THE USE OF HEAVY CONSTRUCTION EQUIPMENT NECESSITATES GREATER PROTECTION FOR THE PIPE THAN FINISHED GRADE COVER MINIMUMS FOR NORMAL HIGHWAY TRAFFIC.

PIPE SPAN, INCHES	AXLE LOADS (kips)			
	18-50	50-75	75-110	110-150
	MINIMUM COVER (FT)			
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
78-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

*MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

CONSTRUCTION LOADING DIAGRAM

SCALE: N.T.S.

SPECIFICATION FOR DESIGNED DETENTION SYSTEM:

SCOPE
THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE DESIGNED DETENTION SYSTEM DETAILED IN THE PROJECT PLANS.

MATERIAL
THE MATERIAL SHALL CONFORM TO THE APPLICABLE REQUIREMENTS LISTED BELOW:

ALUMINIZED TYPE 2 STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-274 OR ASTM A-92.

THE GALVANIZED STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-218 OR ASTM A-929.

THE POLYMER COATED STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-246 OR ASTM A-742.

THE ALUMINUM COILS SHALL CONFORM TO THE APPLICABLE OF AASHTO M-197 OR ASTM B-744.

CONSTRUCTION LOADS
CONSTRUCTION LOADS MAY BE HIGHER THAN FINAL LOADS. FOLLOW THE MANUFACTURER'S OR NCSPA GUIDELINES.

NOTE:
THESE DRAWINGS ARE FOR CONCEPTUAL PURPOSES AND DO NOT REFLECT ANY LOCAL PREFERENCES OR REGULATIONS. PLEASE CONTACT YOUR LOCAL CONTECH REP FOR MODIFICATIONS.

PIPE
THE PIPE SHALL BE MANUFACTURED IN ACCORDANCE TO THE APPLICABLE REQUIREMENTS LISTED BELOW:

ALUMINIZED TYPE 2: AASHTO M-36 OR ASTM A-760

GALVANIZED: AASHTO M-36 OR ASTM A-760

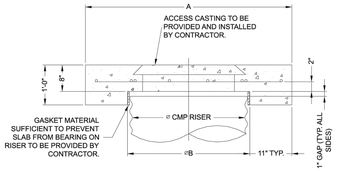
POLYMER COATED: AASHTO M-245 OR ASTM A-762

ALUMINUM: AASHTO M-196 OR ASTM B-745

APPLICABLE
HANDLING AND ASSEMBLY
SHALL BE IN ACCORDANCE WITH NCSPS (NATIONAL CORRUGATED STEEL PIPE ASSOCIATION) FOR ALUMINIZED TYPE 2, GALVANIZED OR POLYMER COATED STEEL. SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS FOR ALUMINUM PIPE.

APPLICABLE REQUIREMENTS
INSTALLATION
SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SECTION 26, DIVISION II DIVISION II OR ASTM A-798 (FOR ALUMINIZED TYPE 2, GALVANIZED OR POLYMER COATED STEEL) OR ASTM B-788 (FOR ALUMINUM PIPE) AND IN CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. IF THERE ARE ANY INCONSISTENCIES OR CONFLICTS THE CONTRACTOR SHOULD DISCUSS AND RESOLVE WITH THE SITE ENGINEER.

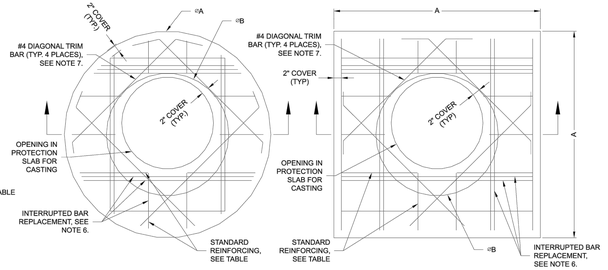
IT IS ALWAYS THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.



SECTION VIEW

REINFORCING TABLE				
∅ CMP RISER	A	∅ B	REINFORCING	**BEARING PRESSURE (PSF)
24"	∅ 4' 4'X4'	26"	#5 @ 12" OCEW #5 @ 12" OCEW	2,410 1,780
30"	∅ 4'-6" 4'-6" X 4'-6"	32"	#5 @ 12" OCEW #5 @ 12" OCEW	2,120 1,530
36"	∅ 5' 5' X 5'	38"	#5 @ 10" OCEW #5 @ 10" OCEW	1,890 1,350
42"	∅ 5'-6" 5'-6" X 5'-6"	44"	#5 @ 10" OCEW #5 @ 9" OCEW	1,720 1,210
48"	∅ 6' 6' X 6'	50"	#5 @ 9" OCEW #5 @ 8" OCEW	1,600 1,100

** ASSUMED SOIL BEARING CAPACITY



ROUND OPTION PLAN VIEW

SQUARE OPTION PLAN VIEW

NOTES:

1. DESIGN IN ACCORDANCE WITH AASHTO, 17th EDITION.
2. DESIGN LOAD HS25.
3. EARTH COVER = 1' MAX.
4. CONCRETE STRENGTH = 3,500 psi
5. REINFORCING STEEL = ASTM A615, GRADE 60.
6. PROVIDE ADDITIONAL REINFORCING AROUND OPENINGS EQUAL TO THE BARS INTERRUPTED, HALF EACH SIDE. ADDITIONAL BARS TO BE IN THE SAME PLANE.
7. TRIM OPENING WITH DIAGONAL #4 BARS, EXTEND BARS A MINIMUM OF 12" BEYOND OPENING, BEND BARS AS REQUIRED TO MAINTAIN BAR COVER.
8. PROTECTION SLAB AND ALL MATERIALS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
9. DETAIL DESIGN BY DELTA ENGINEERING, BINGHAMTON, NY.

MANHOLE CAP DETAIL

SCALE: N.T.S.

OUTLET CONTROL STRUCTURE

WQCV = 653 CF
WQCV RELEASE RATE = 40-HOUR DRAIN

25-YR DETENTION VOLUME = 302 CF
TOTAL DETENTION VOLUME OF WQCV AND 25-YR = 955 CF
25-YR RELEASE TAE = 0.50 CFS

*100-YR DETENTION VOLUME IS LESS THAN 25-YR REQUIREMENT AND DOES NOT NECESSITATE ADDITIONAL VOLUME.
100-YR RELEASE RATE = 1.07 CFS

**OUTLET STRUCTURE TO PROVIDE OVERFLOW THROUGH STRUCTURE TO PREVENT SURCHARGING.

This design and information shown on this drawing is provided as a service by CONTECH Engineered Solutions LLC (Contech). Contech Engineered Solutions LLC ("Contech"). Neither this drawing, nor any part thereof, may be used, reproduced or modified in any manner without the prior written consent of Contech. Failure to comply is done at the user's own risk and Contech expressly disclaims any liability or responsibility for such use.

If discrepancies between the supplied information upon which this drawing is based and actual field conditions are encountered as site work progresses, these discrepancies must be reported to Contech immediately for re-evaluation of the design. Contech accepts no liability for designs based on missing, incomplete or inaccurate information supplied by others.

DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH CMP DETENTION SYSTEMS
CONTECH DYODS DRAWING

DYO14738 3427c Granite Street
DETENTION SYSTEM
Frisco, CO
DETENTION SYSTEM

PROJECT No.: 4760	SEQ. No.: 14738	DATE: 3/21/2022
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

G:\ENGINEERING\DETENTION\Projects\DYO\14738 3427c Granite Street\Drawings\3427c-01-GRP-DET-01.dwg, 3/25/2022 10:10:02 AM

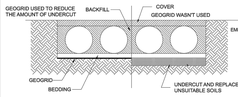
CMP DETENTION INSTALLATION GUIDE

PROPER INSTALLATION OF A FLEXIBLE UNDERGROUND DETENTION SYSTEM WILL ENSURE LONG-TERM PERFORMANCE. THE CONFIGURATION OF THESE SYSTEMS OFTEN REQUIRES SPECIAL CONSTRUCTION PRACTICES THAT DIFFER FROM CONVENTIONAL FLEXIBLE PIPE CONSTRUCTION. CONTECH ENGINEERED SOLUTIONS STRONGLY SUGGESTS SCHEDULING A PRE-CONSTRUCTION MEETING WITH YOUR LOCAL SALES ENGINEER TO DETERMINE IF ADDITIONAL MEASURES, NOT COVERED IN THIS GUIDE, ARE APPROPRIATE FOR YOUR SITE.

FOUNDATION

CONSTRUCT A FOUNDATION THAT CAN SUPPORT THE DESIGN LOADING APPLIED BY THE PIPE AND ADJACENT BACKFILL WEIGHT AS WELL AS MAINTAIN ITS INTEGRITY DURING CONSTRUCTION.

IF SOFT OR UNSUITABLE SOILS ARE ENCOUNTERED, REMOVE THE POOR SOILS DOWN TO A SUITABLE DEPTH AND THEN BUILD UP TO THE APPROPRIATE ELEVATION WITH A COMPETENT BACKFILL MATERIAL. THE STRUCTURAL FILL MATERIAL GRADATION SHOULD NOT ALLOW THE MIGRATION OF FINES, WHICH CAN CAUSE SETTLEMENT OF THE DETENTION SYSTEM OR PAVEMENT ABOVE. IF THE STRUCTURAL FILL MATERIAL IS NOT COMPATIBLE WITH THE UNDERLYING SOILS AN ENGINEERING FABRIC SHOULD BE USED AS A SEPARATOR. IN SOME CASES, USING A STIFF REINFORCING GEOGRID REDUCES OVER EXCAVATION AND REPLACEMENT FILL QUANTITIES.

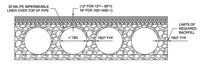


GRADE THE FOUNDATION SUBGRADE TO A UNIFORM OR SLIGHTLY SLOPING GRADE. IF THE SUBGRADE IS CLAY OR RELATIVELY NON-POROUS AND THE CONSTRUCTION SEQUENCE WILL LAST FOR AN EXTENDED PERIOD OF TIME, IT IS BEST TO SLOPE THE GRADE TO ONE END OF THE SYSTEM. THIS WILL ALLOW EXCESS WATER TO DRAIN QUICKLY, PREVENTING SATURATION OF THE SUBGRADE.

GEOMEMBRANE BARRIER

A SITE'S RESISTIVITY MAY CHANGE OVER TIME WHEN VARIOUS TYPES OF SALTING AGENTS ARE USED, SUCH AS ROAD SALTS FOR DEICING AGENTS. IF SALTING AGENTS ARE USED ON OR NEAR THE PROJECT SITE, A GEOMEMBRANE BARRIER IS RECOMMENDED WITH THE SYSTEM. THE GEOMEMBRANE LINER IS INTENDED TO HELP PROTECT THE SYSTEM FROM THE POTENTIAL ADVERSE EFFECTS THAT MAY RESULT FROM THE USE OF SUCH AGENTS INCLUDING PREMATURE CORROSION AND REDUCED ACTUAL SERVICE LIFE.

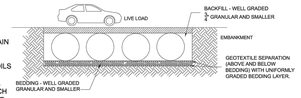
THE PROJECT'S ENGINEER OF RECORD IS TO EVALUATE WHETHER SALTING AGENTS WILL BE USED ON OR NEAR THE PROJECT SITE, AND USE HIS/HER BEST JUDGEMENT TO DETERMINE IF ANY ADDITIONAL PROTECTIVE MEASURES ARE REQUIRED. BELOW IS A TYPICAL DETAIL SHOWING THE PLACEMENT OF A GEOMEMBRANE BARRIER FOR PROJECTS WHERE SALTING AGENTS ARE USED ON OR NEAR THE PROJECT SITE.



IN-SITU TRENCH WALL

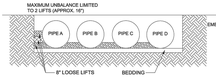
IF EXCAVATION IS REQUIRED, THE TRENCH WALL NEEDS TO BE CAPABLE OF SUPPORTING THE LOAD THAT THE PIPE SHEDS AS THE SYSTEM IS LOADED. IF SOILS ARE NOT CAPABLE OF SUPPORTING THESE LOADS, THE PIPE CAN DEFLECT. PERFORM A SIMPLE SOIL PRESSURE CHECK USING THE APPLIED LOADS TO DETERMINE THE LIMITS OF EXCAVATION BEYOND THE SPRING LINE OF THE OUTER MOST PIPES.

IN MOST CASES THE REQUIREMENTS FOR A SAFE WORK ENVIRONMENT AND PROPER BACKFILL PLACEMENT AND COMPACTION TAKE CARE OF THIS CONCERN.



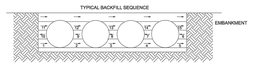
BACKFILL PLACEMENT

MATERIAL SHALL BE WORKED INTO THE PIPE HAUNCHES BY MEANS OF SHOVEL-SLICING, RODDING, AIR TAMPER, VIBRATORY ROD, OR OTHER EFFECTIVE METHODS.

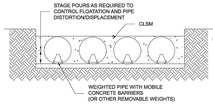


IF AASHTO T99 PROCEDURES ARE DETERMINED INFEASIBLE BY THE GEOTECHNICAL ENGINEER OF RECORD, COMPACTION IS CONSIDERED ADEQUATE WHEN NO FURTHER YIELDING OF THE MATERIAL IS OBSERVED UNDER THE COMPACTOR, OR UNDER FOOT, AND THE GEOTECHNICAL ENGINEER OF RECORD (OR REPRESENTATIVE THEREOF) IS SATISFIED WITH THE LEVEL OF COMPACTION.

FOR LARGE SYSTEMS, CONVEYOR SYSTEMS, BACKHOES WITH LONG REACHES OR DRAGLINES WITH STONE BUCKETS MAY BE USED TO PLACE BACKFILL. ONCE MINIMUM COVER FOR CONSTRUCTION LOADING ACROSS THE ENTIRE WIDTH OF THE SYSTEM IS REACHED, ADVANCE THE EQUIPMENT TO THE END OF THE RECENTLY PLACED FILL, AND BEGIN THE SEQUENCE AGAIN UNTIL THE SYSTEM IS COMPLETELY BACKFILLED. THIS TYPE OF CONSTRUCTION SEQUENCE PROVIDES ROOM FOR STOCKPILED BACKFILL DIRECTLY BEHIND THE BACKHOE, AS WELL AS THE MOVEMENT OF CONSTRUCTION TRAFFIC. MATERIAL STOCKPILES ON TOP OF THE BACKFILLED DETENTION SYSTEM SHOULD BE LIMITED TO 6- TO 10-FEET HIGH AND MUST PROVIDE BALANCED LOADING ACROSS ALL BARRELS. TO DETERMINE THE PROPER COVER OVER THE PIPES TO ALLOW THE MOVEMENT OF CONSTRUCTION EQUIPMENT SEE TABLE 1, OR CONTACT YOUR LOCAL CONTECH SALES ENGINEER.



WHEN FLOWABLE FILL IS USED, YOU MUST PREVENT PIPE FLOATATION. TYPICALLY, SMALL LIFTS ARE PLACED BETWEEN THE PIPES AND THEN ALLOWED TO SET-UP PRIOR TO THE PLACEMENT OF THE NEXT LIFT. THE ALLOWABLE THICKNESS OF THE CLSM LIFT IS A FUNCTION OF A PROPER BALANCE BETWEEN THE UPLIFT FORCE OF THE CLSM, THE OPPOSING WEIGHT OF THE PIPE, AND THE EFFECT OF OTHER RESTRAINING MEASURES. THE PIPE CAN CARRY LIMITED FLUID PRESSURE WITHOUT PIPE DISTORTION OR DISPLACEMENT, WHICH ALSO AFFECTS THE CLSM LIFT THICKNESS. YOUR LOCAL CONTECH SALES ENGINEER CAN HELP DETERMINE THE PROPER LIFT THICKNESS.

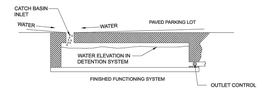


CONSTRUCTION LOADING

TYPICALLY, THE MINIMUM COVER SPECIFIED FOR A PROJECT ASSUMES H-20 LIVE LOAD. BECAUSE CONSTRUCTION LOADS OFTEN EXCEED DESIGN LIVE LOADS, INCREASED TEMPORARY MINIMUM COVER REQUIREMENTS ARE NECESSARY. SINCE CONSTRUCTION EQUIPMENT VARIES FROM JOB TO JOB, IT IS BEST TO ADDRESS EQUIPMENT SPECIFIC MINIMUM COVER REQUIREMENTS WITH YOUR LOCAL CONTECH SALES ENGINEER DURING YOUR PRE-CONSTRUCTION MEETING.

ADDITIONAL CONSIDERATIONS

BECAUSE MOST SYSTEMS ARE CONSTRUCTED BELOW-GRADE, RAINFALL CAN RAPIDLY FILL THE EXCAVATION; POTENTIALLY CAUSING FLOATATION AND MOVEMENT OF THE PREVIOUSLY PLACED PIPES. TO HELP MITIGATE POTENTIAL PROBLEMS, IT IS BEST TO START THE INSTALLATION AT THE DOWNSTREAM END WITH THE OUTLET ALREADY CONSTRUCTED TO ALLOW A ROUTE FOR THE WATER TO ESCAPE. TEMPORARY DIVERSION MEASURES MAY BE REQUIRED FOR HIGH FLOWS DUE TO THE RESTRICTED NATURE OF THE OUTLET PIPE.



CMP DETENTION SYSTEM INSPECTION AND MAINTENANCE

UNDERGROUND STORMWATER DETENTION AND INFILTRATION SYSTEMS MUST BE INSPECTED AND MAINTAINED AT REGULAR INTERVALS FOR PURPOSES OF PERFORMANCE AND LONGEVITY.

INSPECTION

INSPECTION IS THE KEY TO EFFECTIVE MAINTENANCE OF CMP DETENTION SYSTEMS AND IS EASILY PERFORMED. CONTECH RECOMMENDS ONGOING, ANNUAL INSPECTIONS. SITES WITH HIGH TRASH LOAD OR SMALL OUTLET CONTROL ORIFICES MAY NEED MORE FREQUENT INSPECTIONS. THE RATE AT WHICH THE SYSTEM COLLECTS POLLUTANTS WILL DEPEND MORE ON SITE SPECIFIC ACTIVITIES RATHER THAN THE SIZE OR CONFIGURATION OF THE SYSTEM.

INSPECTIONS SHOULD BE PERFORMED MORE OFTEN IN EQUIPMENT WASH-DOWN AREAS, IN CLIMATES WHERE SANDING AND/OR SALTING OPERATIONS TAKE PLACE, AND IN OTHER VARIOUS INSTANCES IN WHICH ONE WOULD EXPECT HIGHER ACCUMULATIONS OF SEDIMENT OR ABRASIVE/CORROSIVE CONDITIONS. A RECORD OF EACH INSPECTION IS TO BE MAINTAINED FOR THE LIFE OF THE SYSTEM

MAINTENANCE

CMP DETENTION SYSTEMS SHOULD BE CLEANED WHEN AN INSPECTION REVEALS ACCUMULATED SEDIMENT OR TRASH IS CLOGGING THE DISCHARGE ORIFICE.

ACCUMULATED SEDIMENT AND TRASH CAN TYPICALLY BE EVACUATED THROUGH THE MANHOLE OVER THE OUTLET ORIFICE. IF MAINTENANCE IS NOT PERFORMED AS RECOMMENDED, SEDIMENT AND TRASH MAY ACCUMULATE IN FRONT OF THE OUTLET ORIFICE. MANHOLE COVERS SHOULD BE SECURELY SEATED FOLLOWING CLEANING ACTIVITIES. CONTECH SUGGESTS THAT ALL SYSTEMS BE DESIGNED WITH AN ACCESS/INSPECTION MANHOLE SITUATED AT OR NEAR THE INLET AND THE OUTLET ORIFICE. SHOULD IT BE NECESSARY TO GET INSIDE THE SYSTEM TO PERFORM MAINTENANCE ACTIVITIES, ALL APPROPRIATE PRECAUTIONS REGARDING CONFINED SPACE ENTRY AND OSHA REGULATIONS SHOULD BE FOLLOWED.

ANNUAL INSPECTIONS ARE BEST PRACTICE FOR ALL UNDERGROUND SYSTEMS. DURING THIS INSPECTION, IF EVIDENCE OF SALTING/DE-ICING AGENTS IS OBSERVED WITHIN THE SYSTEM, IT IS BEST PRACTICE FOR THE SYSTEM TO BE RINSED, INCLUDING ABOVE THE SPRING LINE SOON AFTER THE SPRING THAW AS PART OF THE MAINTENANCE PROGRAM FOR THE SYSTEM.

MAINTAINING AN UNDERGROUND DETENTION OR INFILTRATION SYSTEM IS EASIEST WHEN THERE IS NO FLOW ENTERING THE SYSTEM. FOR THIS REASON, IT IS A GOOD IDEA TO SCHEDULE THE CLEANOUT DURING DRY WEATHER.

THE FOREGOING INSPECTION AND MAINTENANCE EFFORTS HELP ENSURE UNDERGROUND PIPE SYSTEMS USED FOR STORMWATER STORAGE CONTINUE TO FUNCTION AS INTENDED BY IDENTIFYING RECOMMENDED REGULAR INSPECTION AND MAINTENANCE PRACTICES. INSPECTION AND MAINTENANCE RELATED TO THE STRUCTURAL INTEGRITY OF THE PIPE OR THE SOUNDNESS OF PIPE JOINT CONNECTIONS IS BEYOND THE SCOPE OF THIS GUIDE.

This design and information shown on this drawing is provided as a service by CONTECH Engineered Solutions LLC (Contech). Contech Engineered Solutions LLC ("Contech"). Neither this drawing, nor any part thereof, may be used, reproduced or modified in any manner without the prior written consent of Contech. Failure to comply is done at the user's own risk and Contech expressly disclaims any liability or responsibility for such use.

If discrepancies between the supplied information upon which this drawing is based and actual field conditions are encountered as site work progresses, these discrepancies must be reported to Contech immediately for re-evaluation of the design. Contech accepts no liability for designs based on missing, incomplete or inaccurate information supplied by others.

DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH CMP DETENTION SYSTEMS
CONTECH DYODS DRAWING

DYO14738 3427c Granite Street
DETENTION SYSTEM
Frisco, CO
DETENTION SYSTEM

PROJECT No.: 4760	SEQ. No.: 14738	DATE: 3/21/2022
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

G:\ENGINEERING\DETENTION\Projects\DYO\14738 3427c Granite Street\Drawings\3427c-01-GRP-DET-01.dwg, 3/25/2022 10:10:02 AM

UNDERGROUND DETENTION STRUCTURE 2 OF 2
NTS

10
CC103

PLOT DATE: 6/18/2021 1:20:59 PM
K:\3427c - Granite Street Workforce Housing\Drawings\3427c-01-GRP-DET-01.dwg, 3/25/2022 - 2:32 PM, ZAB

JVA CONSULTING ENGINEERS
47 Cooper Creek Way, Suite 300
Winter Park, CO 80482
jvajva.com
970.722.7677

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

JVA Project No: 3427c

Sheet Issue & Revision Log

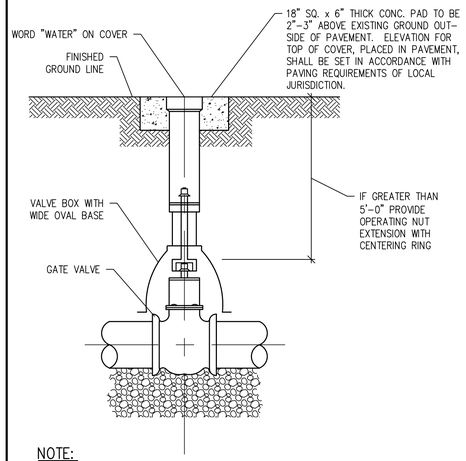
No	Date	Description
	03/25/22	BID SET

DRAWN BY: SAR/ZAB **REVIEWED BY:** CWK/KEV

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

UNDERGROUND DETENTION DETAILS

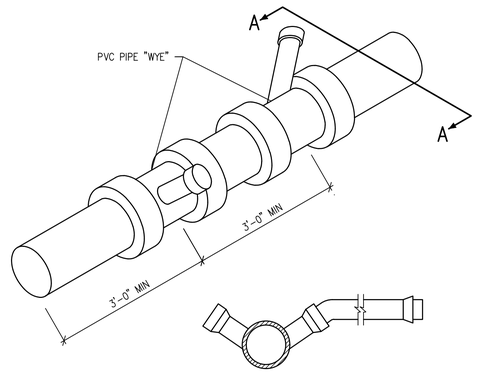
CG509



NOTE:

1. CARE SHALL BE TAKEN WHEN INSTALLING VALVES ON LINES TO ASSURE PROPER SUPPORT OF THE VALVES.
2. WOOD BLOCKS OR 3/4" WASHED ROCK TO BE INSTALLED UNDER THE VALVE TO PROVIDE PROPER SUPPORT WHERE REQUIRED.
3. VALVES SHALL NOT BE PLACED IN CONCRETE CROSS PANS.

GATE VALVE DETAIL (4 CG103)
NTS

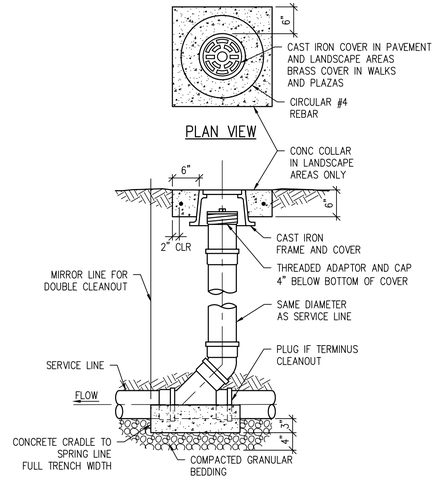


SECTION A–A

NOTES:

1. SANITARY SEWER SERVICE TAPS SHALL BE LOCATED ON THE MAIN AT THE 2 O'CLOCK OR 10 O'CLOCK POSITION.
2. THE MINIMUM DISTANCE BETWEEN ANY TWO CONSECUTIVE FITTINGS SHALL BE 3 FEET, MEASURED BETWEEN FITTING CENTERLINES.
3. SANITARY SEWER SERVICE TAPS SHALL NOT BE MADE WITHIN 3 FEET OF A PIPE JOINT, OR 5 FEET FROM EDGE OF MANHOLE BASE.
4. A MAXIMUM OF FOUR SERVICE TAPS ARE ALLOWED PER 20 FOOT LENGTH OF PIPE.
5. ALL SANITARY SEWER TAPS SHALL USE "WYE" STYLE FITTINGS. TEES ARE NOT ALLOWED.
6. SERVICE CONNECTIONS TO MANHOLES SHALL BE PERFORMED IN ACCORDANCE WITH THE "SERVICE CONNECTION TO DEAD–END MANHOLE" CONSTRUCTION DETAIL.
7. TAPS IN STAGGERED CONFIGURATION AT 10 O'CLOCK OR 2 O'CLOCK POSITION

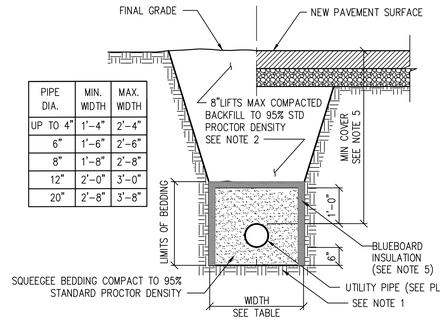
DOMESTIC SEWER TAPPING DETAIL (3 CG103)
NTS



SANITARY CLEANOUT DETAIL (2 CG103)
NTS

UTILITY DETAIL NOTES:

1. CONTRACTOR TO USE TOWN OF FRISCO WATER DISTRICT AND FRISCO SANITATION DISTRICT STANDARDS AND DETAILS IF AVAILABLE.
2. REFER TO DETAILS ON THIS SHEET IF TOWN OF FRISCO WATER DISTRICT AND/OR FRISCO SANITATION DISTRICT STANDARD DETAILS ARE NOT AVAILABLE.

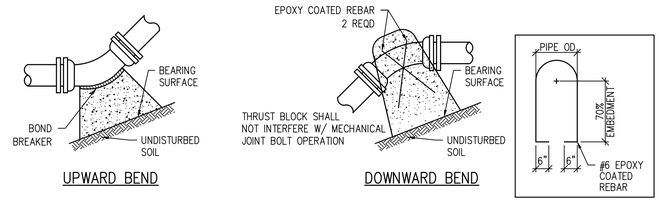


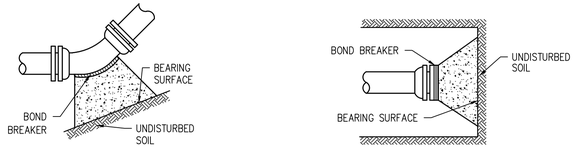
PIPE DIA.	MIN. WIDTH	MAX. WIDTH
UP TO 4"	1'–4"	2'–4"
6"	1'–6"	2'–6"
8"	1'–8"	2'–8"
12"	2'–0"	3'–0"
20"	2'–8"	3'–8"

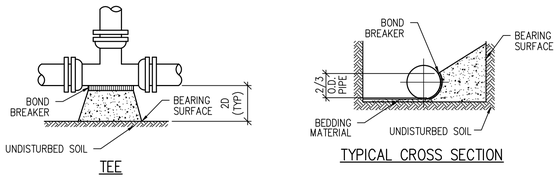
NOTES:

1. IF UNSTABLE MATERIALS ARE FOUND IN TRENCH BOTTOM, OVER EXCAVATE 12" BELOW STD EMBEDMENT AND FILL WITH 3/4" CRUSHED ROCK, COMPACTED TO 95%
2. COMPACTED BACKFILL TO 90% STD PROCTOR DENSITY IN NON–DRIVING SURFACES AND 95% UNDER PAVEMENT
3. SHOULD THE TRENCH BE EXCAVATED WIDER THAN ALLOWED A CONCRETE CRADLE SHALL BE PLACED WITH 2500PSI CONCRETE FROM TRENCH BOTTOM TO PIPE SPRINGLINE
4. TRENCH TO BE BRACED OR SHEETED AS NECESSARY FOR THE SAFETY OF THE WORKERS AND THE PROTECTION OF OTHER UTILITIES IN ACCORDANCE WITH LOCAL STATE AND FEDERAL SAFETY REGULATIONS
5. REFER TO WATER AND SANITATION DISTRICTS FOR MINIMUM COVER
   - 5.1. WATER: 8.5' MIN COVER
   - 5.2. SANITARY:
     - 5.2.1. 9' MIN COVER;
     - 5.2.2. OR 7' MIN COVER W/ 2" INSULATION ON TOP AND SIDES OF BEDDING EXTENTS

SANITARY SEWER & WATER PIPE BEDDING DETAIL (1 CG103)
NTS







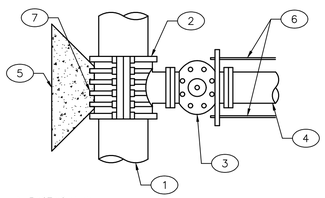
NOTES:

1. BEARING SURFACES SHOWN IN CHART ARE MINIMUM SQUARE FEET
2. BASED ON 150 PSI INTERNAL PIPE PRESSURE PLUS WATER HAMMER. 4", 6", 8", & 12" WATER HAMMER = 110 PSI 16", 20' AND 24" WATER HAMMER = 70 PSI
3. BASED ON 3000psf SOIL BEARING CAPACITY
4. USE TYPE II PORTLAND CEMENT 3000 PSI CONCRETE
5. ALL VALVES, TEES, BENDS AND PLUGS SHALL BE RESTRAINED AND KICKBLOCKED

SIZE OF PIPE	SURFACE AREA (SQ FT)					CONC VOL (CU YD)
	TEE OR DEAD END	BENDS				
		11–1/4°	22–1/2°	45°	90°	VERT 45°
4"	1.50	1.00	1.00	1.00	2.0	0.34
6"	3.00	1.00	1.25	2.25	4.5	0.71
8"	5.25	1.00	2.00	4.00	8.0	1.22
12"	11.25	2.25	4.50	8.75	17.0	1.83
16"	19.00	3.50	7.50	14.50	27.00	2.59
20"	25.00	5.00	10.00	19.50	35.50	6.93
24"	36.00	6.50	14.00	27.75	51.00	9.88

MINIMUM BEARING SURFACE AREA (IN SQUARE FEET)

CONCRETE THRUST BLOCK DETAIL (6 CG103)
NTS

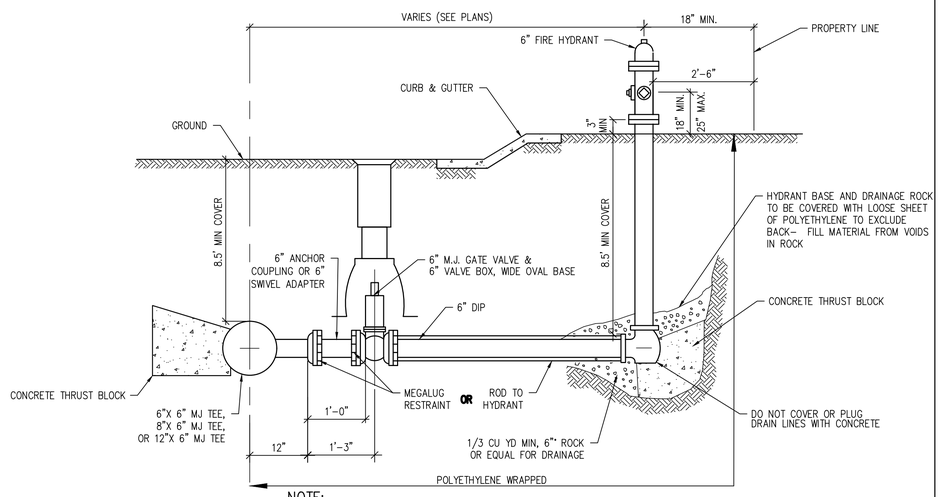


1. EXISTING MAIN
2. FABRICATED STEEL TAPPING SLEEVE WITH EPOXY SHOP COATING, STAINLESS STEEL BOLTS AND NUTS
3. TAPPING VALVE
4. DOUBLE SPIGOT PIPE
5. CONCRETE THRUST BLOCK (SEE THRUST BLOCK DETAIL)
6. TIE RODS (SEE LENGTH OF PIPE RESTRAINT DETAIL) (IF REQUIRED)
7. BOND BREAKER BETWEEN CONCRETE AND WET TAP SADDLE–8 MIL POLYETHYLENE

NOTE:

DISTRICT MUST BE NOTIFIED AT LEAST 24 HOURS BEFORE TAPPING. A DISTRICT REPRESENTATIVE MUST BE ONSITE DURING TAPPING.

TAPPING TEE AND VALVE DETAIL (7 CG103)
NTS



NOTE:

1. ALTERNATE TO THE ABOVE, FASTEN MJ VALVE DIRECTLY TO A MJ ANCHOR TEE (ALSO CALLED SWIVEL TEE)
2. NO HORIZONTAL OR VERTICAL BENDS ARE ALLOWED IN FIRE HYDRANT BRANCH OR SPRINKLER LINES
3. NO PORTION OF THE FIRE HYDRANT MAY PROTRUDE INTO SIDEWALK AREA

FIRE HYDRANT ASSEMBLY DETAIL (5 CG103)
NTS

JVA CONSULTING ENGINEERS
47 Cooper Creek Way, Suite 300
Winter Park, CO 80482
jvajva.com
970.722.7677

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

JVA Project No: 3427c

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

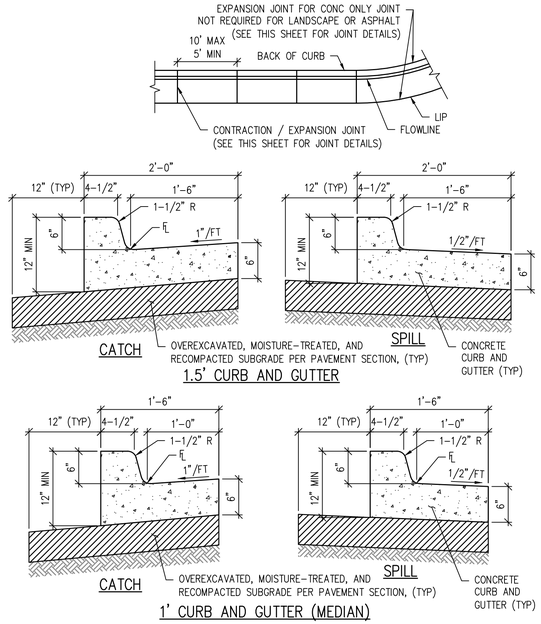
DRAWN BY: SAR/ZAB **REVIEWED BY:** CWK/KEV

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

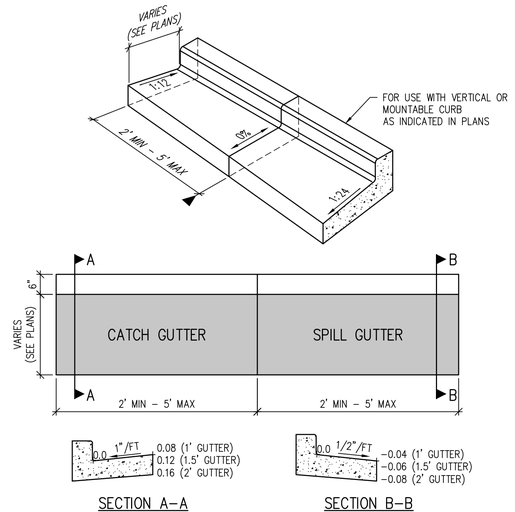
UTILITY DETAILS

CG510

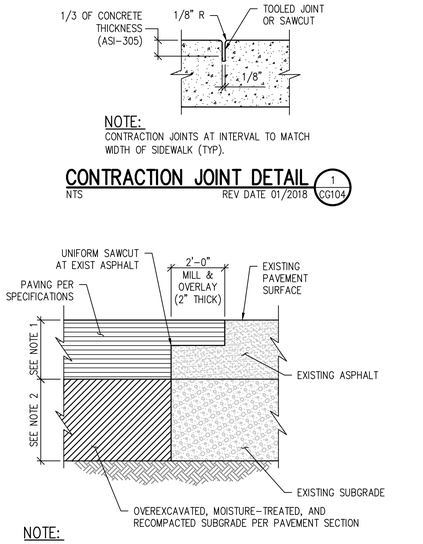
PLOT DATE: 5/19/2021 1:20:59 PM K:\3427c – Granite Street Workforce Housing\Drawings\3427c–02–UTP–DET–01.dwg, 3/25/2022 – 2:32 PM, ZAB



PRIVATE CURB AND GUTTER DETAIL 4 CG104
NTS

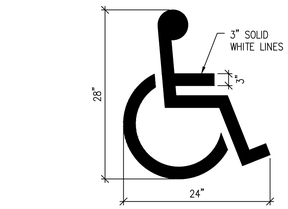


GUTTER CATCH SPILL TRANSITION DETAIL 3 CG104
NTS

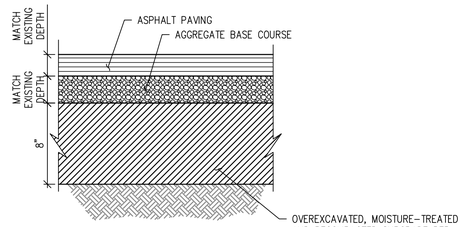


CONTRACTION JOINT DETAIL 1 CG104
NTS REV DATE 01/2018

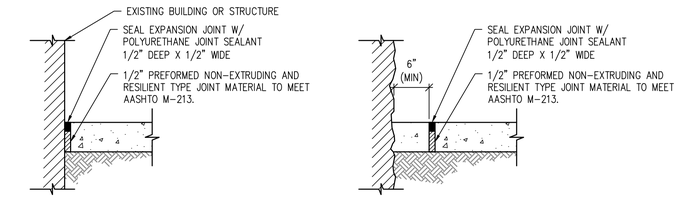
ASPHALT "T" PATCH DETAIL 2 CG104
NTS

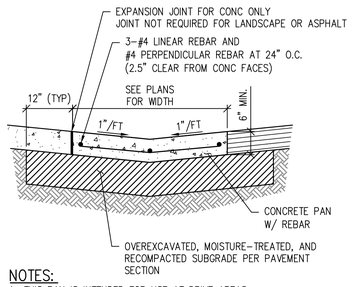


ACCESSIBLE SYMBOL DETAIL 6 CG104
NTS

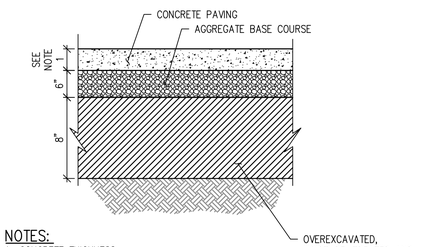


COMPOSITE ASPHALT PAVEMENT SECTION DETAIL 5 CG104
NTS

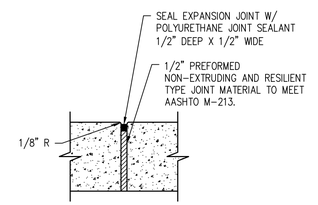




REINFORCED CONCRETE PAN DETAIL 9 CG104
NTS



COMPOSITE CONCRETE PAVEMENT SECTION DETAIL 8 CG104
NTS



EXPANSION JOINT DETAIL 7 CG104
NTS

JVA CONSULTING ENGINEERS
47 Cooper Creek Way, Suite 300
Winter Park, CO 80482
jvajva.com
970.722.7677

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

JVA Project No: 3427c

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

DRAWN BY: SAR/ZAB **REVIEWED BY:** CWK/KEV

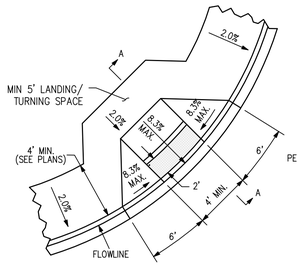
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

SITE DETAILS

CG511

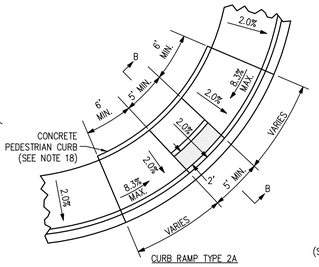
K:\3427c - Granite Street Workforce Housing\Drawings\3427c-03-HCP-DET-01.dwg, 3/25/2022 - 2:32 PM, ZAB

PLOT DATE: 5/19/2021 1:20:59 PM



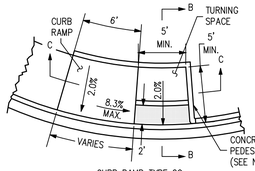
CURB RAMP TYPE 1A

SEE NOTE 9.

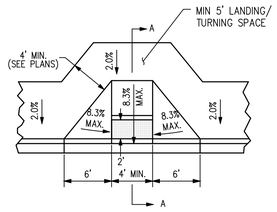


CURB RAMP TYPE 2A

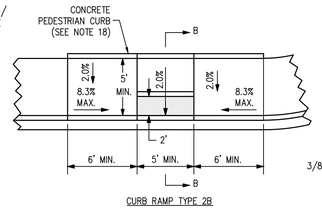
SEE NOTE 9.



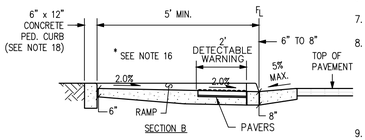
CURB RAMP TYPE 2C



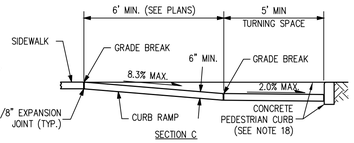
CURB RAMP TYPE 1B DETAIL



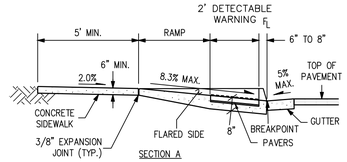
CURB RAMP TYPE 2B



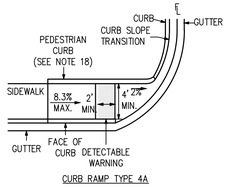
SECTION B



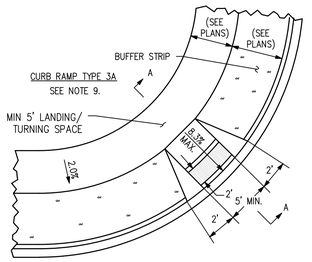
SECTION C



SECTION A



CURB RAMP TYPE 4A



CURB RAMP TYPE 3A

SEE NOTE 9.

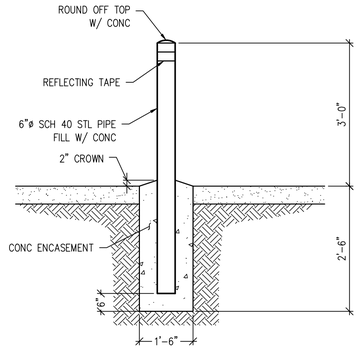
CURB RAMP DETAIL

NTS

(10 / CG104)

NOTES:

1. ALL DETECTABLE WARNING SURFACES SHALL BE INSTALLED AT SIDEWALK TO STREET TRANSITIONS.THEY SHALL HAVE A TRUNCATED DOME SURFACE. THE DOMES SHALL BE IN A SQUARE GRID PATTERN AND ALIGNED WITH PEDESTRIAN TRAFFIC. THE DETECTABLE WARNINGS SHALL BE CONTRASTING COLOR TO THE SURROUNDING SIDEWALK.
2. ALL DETECTABLE WARNING SURFACES SHALL START A MINIMUM OF 6 INCHES FROM THE FLOWLINE OF THE CURB AND NOT BE MORE THAN A MAXIMUM OF 8 INCHES FROM ANY POINT ON THE FLOWLINE OF THE CURB, WITH EXCEPTION FOR TYPES 1B MODIFIED AND 3B MODIFIED CURB RAMPS AS THIS DIMENSION MAY BE GREATER THAN 8 INCHES ON ONE SIDE OF THE RADIUS.
3. THE RAMP SLOPE AND DETECTABLE WARNING SURFACE SHALL BE 8.3% OR FLATTER.
4. RAMP SLOPE MAY NOT EXCEED 8.3%, CROSS SLOPE MAY NOT EXCEED 2.0% MAXIMUM SLOPES MAY NOT BE EXCEEDED REGARDLESS OF TOLERANCES, EXCEEDING THE MAXIMUM SLOPE WILL NOT BE ACCEPTED. ADJUST ALL DIMENSIONS PER PLAN.
5. THE MINIMUM WIDTH FOR SIDEWALK IS 4 FEET.
6. DRAINAGE STRUCTURES, TRAFFIC SIGNAL EQUIPMENT, OR OTHER OBSTRUCTIONS SHALL NOT BE INSTALLED IN THE CURB RAMP OR TURNING SPACE AREAS.
7. CONSTRUCTION OF THE CONCRETE PEDESTRIAN CURB SHALL BE INCLUDED IN THE BID PRICE OF THE CONCRETE CURB RAMP.
8. IF THE PLACEMENT OF THE PEDESTRIAN PUSH BUTTON ASSEMBLY ON A TRAFFIC SIGNAL MAST POLE WILL NOT BE WITHIN EASY REACH (10 INCHES OR LESS AND UNOBSTRUCTED) OF ALL PEDESTRIANS (IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT), THEN A SEPARATE PEDESTRIAN PUSH BUTTON POST ASSEMBLY (PPBPA) SHALL BE INSTALLED WITHIN ADA REACH RANGES. THE PPBPA SHALL MEET THE PROVISIONS FOUND IN "SECTION 4E.08 THROUGH 4E.13 – PEDESTRIAN DETECTORS" OF THE 2009 MUTCD MANUAL WITH REVISIONS 1 AND 2.
9. DIAGONAL CURB RAMPS (ON THE APEX) ARE NOT PREFERRED IN NEW CONSTRUCTION. A SINGLE DIAGONAL CURB RAMP (ON THE APEX) WILL ONLY BE PERMITTED DURING RECONSTRUCTION OR ALTERATION WHERE PHYSICAL OR SITE CONSTRAINTS PREVENT TWO CURB RAMPS FROM BEING INSTALLED. THE ENGINEER SHALL PROVIDE APPROVED JUSTIFICATION DOCUMENTATION (CDOT CURB RAMP DESIGN VARIANCE REQUEST FORM) FOR CDOT PROJECTS. ALL CURB RAMPS INSTALLED ON THE APEX MUST MEET THE STANDARDS AS DEFINED IN M-608-1.
10. CURB RAMPS (EXCLUDING FLARED SIDES OR BLENDED TRANSITIONS) SHALL BE WHOLLY CONTAINED WITHIN THE WIDTH OF THE CROSSWALK AND/OR THE PEDESTRIAN STREET CROSSING THEY SERVE.
11. ALL CURB RAMP JOINTS AND GRADE BREAKS SHALL BE FLUSH (0" – 1/8"). THE JOINT BETWEEN THE ROADWAY SURFACE AND GUTTER PAN SHALL BE FLUSH.
12. THE CONTRACTOR SHALL VERIFY REMOVAL LIMITS ARE SUFFICIENT TO PROVIDE POSITIVE DRAINAGE, MAINTAIN EXISTING DRAINAGE PATTERNS, AND AVOID PONDING IN THE FINAL CONFIGURATION.
13. TO AVOID CHASING GRADE INDEFINITELY WHEN TRAVERSING THE HEIGHT OF CURB, THE RAMP LENGTH SHALL NOT EXCEED 15 FEET. ADJUST THE RAMP SLOPE AS NEEDED TO PROVIDE ACCESS TO THE MAXIMUM EXTENT TECHNICALLY FEASIBLE.
14. THE CHANGE IN GRADE AT THE BOTTOM OF THE CURB RAMP AND ADJOINING ROAD SURFACE SHALL NOT EXCEED AN ALGEBRAIC DIFFERENCE OF 13.33%. THE COUNTER SLOPE OF THE GUTTER OR ROAD AT THE FOOT OF A CURB RAMP, TURNING SPACE, OR BLENDED TRANSITION SHALL NOT EXCEED 5.0%.
15. FLARED SIDE SLOPES MAY EXCEED 10% ONLY WHERE THEY ABUT A NON-WALKABLE SURFACE OR THE ADJACENT CIRCULATION PATH IS BLOCKED.
16. THE STANDARD TURNING SPACE IS 5 FEET BY 5 FEET.
17. CURB RAMP TYPE 1B, 2B, AND 3B MAY BE USED IN MID-BLOCK.
18. THE PEDESTRIAN CURB IS REQUIRED UNLESS OTHERWISE SPECIFIED
19. FOR FULL DETAIL INCLUDING BAR LIST AND DIMENSION TABLE, SEE CDOT DETAIL M-604-1 SHEETS 1 THROUGH 10.
20. REFER TO PLANS, DETAILS AND SPECIFICATIONS FOR FLATWORK INFORMATION, SUBGRADE PREPARATION, WALK WIDTHS, CONCRETE THICKNESS, ETC.

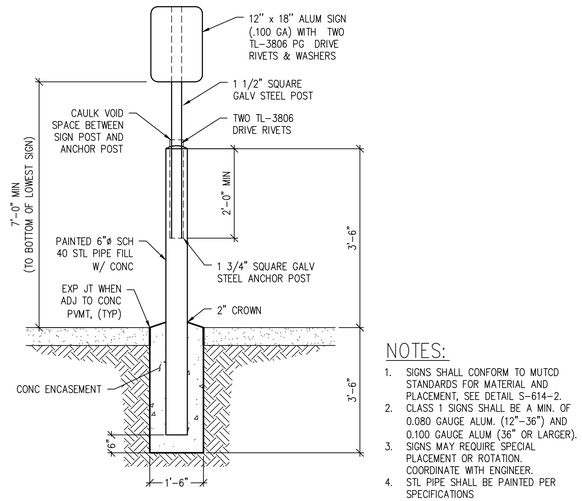


BOLLARD DETAIL

NTS

(11 / CG104)

SIGNAGE LEGEND					
R7-8	RESERVED PARKING	R7-8a	VAN ACCESSIBLE	RP-31	
R7-8bl	WHEELCHAIR ACCESS AISLE ABSOLUTELY NO PARKING	R7-8bC	WHEELCHAIR ACCESS AISLE ABSOLUTELY NO PARKING	R7-8bR	WHEELCHAIR ACCESS AISLE ABSOLUTELY NO PARKING



NOTES:

1. SIGNS SHALL CONFORM TO MUTCD STANDARDS FOR MATERIAL AND PLACEMENT, SEE DETAIL S-614-2.
2. CLASS 1 SIGNS SHALL BE A MIN. OF 0.080 GAUGE ALUM. (12"-36") AND 0.100 GAUGE ALUM (36" OR LARGER).
3. SIGNS MAY REQUIRE SPECIAL PLACEMENT OR ROTATION. COORDINATE WITH ENGINEER.
4. STL PIPE SHALL BE PAINTED PER SPECIFICATIONS

SIGN W/ BOLLARD DETAIL

NTS

(12 / CG104)

JVA CONSULTING ENGINEERS

JVA CONSULTING ENGINEERS
47 Cooper Creek Way, Suite 300
Winter Park, CO 80482
jvajva.com
970.722.7677

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

JVA Project No: 3427c

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

DRAWN BY: SAR/ZAB **REVIEWED BY:** CWK/KEV

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

SITE DETAILS

CG512

K:\3427c - Granite Street Workforce Housing\Drawings\3427c-03-HOP-DET-01.dwg, 3/25/2022 - 2:32 PM, ZAB

PLOT DATE: 5/19/2021 1:20:59 PM

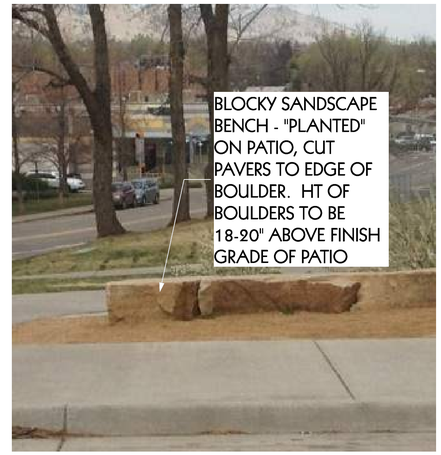
GENERAL NOTES:

1. THE CONTRACTOR SHALL FOLLOW THE LANDSCAPE PLANS AND SPECIFICATIONS AS CLOSELY AS POSSIBLE. ANY SUBSTITUTION OR ALTERATION SHALL NOT BE ALLOWED WITHOUT APPROVAL OF THE OWNER'S REPRESENTATIVE. OVERALL PLANT QUANTITY AND QUALITY SHALL BE CONSISTENT WITH THE PLANS.
2. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL PLANT QUANTITIES. GRAPHIC QUANTITIES TAKES PRECEDENCE OVER WRITTEN QUANTITIES.
3. THE OWNER'S REPRESENTATIVE RESERVES THE RIGHT TO INSPECT AND TAG ALL PLANT MATERIAL PRIOR TO SHIPPING TO THE SITE. IN ALL CASES, THE OWNER'S REPRESENTATIVE MAY REJECT PLANT MATERIAL AT THE SITE IF MATERIAL IS DAMAGED, DISEASED, OR DECLINING IN HEALTH AT THE TIME OF ONSITE INSPECTIONS OR IF THE PLANT MATERIAL DOES NOT MEET THE MINIMUM SPECIFIED STANDARD IDENTIFIED ON THE PLANS AND IN THE SPECIFICATIONS. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER'S REPRESENTATIVE FOR INSPECTION AND APPROVAL OF ALL MATERIALS AND PRODUCTS PRIOR TO INSTALLATION.
4. THE OWNER'S REPRESENTATIVE MAY ELECT TO UPSIZE PLANT MATERIAL AT THEIR DISCRETION BASED ON SELECTION, AVAILABILITY, OR TO ENHANCE SPECIFIC AREAS OF THE PROJECT. THE CONTRACTOR SHALL VERIFY PLANT MATERIAL SIZES WITH OWNER'S REPRESENTATIVE PRIOR TO PURCHASING, SHIPPING OR STOCKING OF PLANT MATERIALS. SUBMIT CHANGE ORDER REQUEST TO OWNER'S REPRESENTATIVE FOR APPROVAL IF ADDITIONAL COST IS REQUESTED BY THE CONTRACTOR PRIOR TO INSTALLATION. RE-STOCKING CHARGES WILL NOT BE APPROVED IF THE CONTRACTOR FAILS TO SUBMIT A REQUEST FOR MATERIAL CHANGES.
5. THE CONTRACTOR SHALL WARRANTY ALL CONTRACTED WORK AND MATERIALS FOR A PERIOD OF ONE YEAR AFTER SUBSTANTIAL COMPLETION HAS BEEN ISSUED BY THE OWNER'S REPRESENTATIVE FOR THE ENTIRE PROJECT UNLESS OTHERWISE SPECIFIED IN
THE CONTRACT DOCUMENTS OR SPECIFICATIONS.
6. REFER TO IRRIGATION PLANS FOR LIMITS AND TYPES OF IRRIGATION DESIGNED FOR THE LANDSCAPE. IN NO CASE SHALL IRRIGATION BE EMITTED WITHIN THE MINIMUM DISTANCE FROM BUILDING OR WALL FOUNDATIONS AS STIPULATED IN THE GEOTECHNICAL REPORT.
ALL IRRIGATION DISTRIBUTION LINES, HEADS AND EMITTERS SHALL BE KEPT OUTSIDE THE MINIMUM DISTANCE AWAY FROM ALL BUILDING AND WALL FOUNDATIONS AS STIPULATED IN THE GEOTECHNICAL REPORT.
7. LANDSCAPE MATERIAL LOCATIONS SHALL HAVE PRECEDENCE OVER IRRIGATION MAINLINE AND LATERAL LOCATIONS. COORDINATE INSTALLATION OF IRRIGATION EQUIPMENT SO THAT IT DOES NOT INTERFERE WITH THE PLANTING OF TREES OR OTHER LANDSCAPE
MATERIAL.
8. THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING POSITIVE DRAINAGE EXISTS IN ALL LANDSCAPE AREAS. SURFACE DRAINAGE ON LANDSCAPE AREAS SHALL NOT FLOW TOWARD STRUCTURES AND FOUNDATIONS. MAINTAIN SLOPE AWAY
FROM FOUNDATIONS PER THE GEOTECHNICAL REPORT RECOMMENDATIONS. ALL LANDSCAPE AREAS BETWEEN WALKS AND CURBS SHALL DRAIN FREELY TO THE CURB UNLESS OTHERWISE IDENTIFIED ON THE GRADING PLAN. IN NO CASE SHALL THE GRADE, TURF THATCH, OR OTHER LANDSCAPE MATERIALS DAM WATER AGAINST WALKS. MINIMUM SLOPES ON LANDSCAPE AREAS SHALL BE 2%, MAXIMUM SLOPE SHALL BE 25% UNLESS SPECIFICALLY IDENTIFIED ON THE PLANS OR APPROVED BY THE OWNER'S REPRESENTATIVE.
9. PRIOR TO INSTALLATION OF PLANT MATERIALS, AREAS THAT HAVE BEEN COMPACTED OR DISTURBED BY CONSTRUCTION ACTIVITY SHALL BE THOROUGHLY LOOSENED TO A DEPTH OF 8"-12" AND AMENDED PER SPECIFICATIONS.
10. ALL LANDSCAPED AREAS ARE TO RECEIVE ORGANIC SOIL PREPARATION AS NOTED IN THE TECHNICAL SPECIFICATIONS.
11. TREES SHALL NOT BE LOCATED IN DRAINAGE SWALES, DRAINAGE AREAS, OR UTILITY EASEMENTS. CONTACT OWNER'S REPRESENTATIVE FOR RELOCATION OF PLANTS IN QUESTIONABLE AREAS PRIOR TO INSTALLATION.
12. THE CENTER OF EVERGREEN TREES SHALL NOT BE PLACED CLOSER THAN 8' AND THE CENTER OF ORNAMENTAL TREES CLOSER THAN 6' FROM A SIDEWALK, STREET OR DRIVE LANE. EVERGREEN TREES SHALL NOT BE LOCATED ANY CLOSER THAN 15' FROM IRRIGATION ROTOR HEADS. NOTIFY OWNER'S REPRESENTATIVE IF TREE LOCATIONS CONFLICT WITH THESE STANDARDS FOR FURTHER DIRECTION.
13. ALL EVERGREEN TREES SHALL BE FULLY BRANCHED TO THE GROUND AND SHALL NOT EXHIBIT SIGNS OF ACCELERATED GROWTH AS DETERMINED BY THE OWNER'S REPRESENTATIVE.
14. ALL TREES ARE TO BE STAKED AND GUYED PER DETAILS FOR A PERIOD OF 3 YEARS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING STAKES AT THE END OF 3 YEARS FROM ACCEPTANCE OF LANDSCAPE INSTALLATION BY THE OWNER'S REPRESENTATIVE. OBTAIN APPROVAL BY OWNER'S REPRESENTATIVE PRIOR TO REMOVAL.
15. ALL TREES INSTALLED ABOVE RETAINING WALLS UTILIZING GEO-GRID MUST BE HAND DUG TO PROTECT GEO-GRID. IF GEO-GRID MUST BE CUT TO INSTALL TREES, APPROVAL MUST BE GIVEN BY OWNER'S REPRESENTATIVE PRIOR TO DOING WORK.
16. ALL TREES IN SEED OR TURF AREAS SHALL RECEIVE MULCH RINGS. OBTAIN APPROVAL FROM OWNER'S REPRESENTATIVE FOR ANY TREES THAT WILL NOT BE MULCHED FOR EXCESSIVE MOISTURE REASONS.
17. SHRUB, GROUNDCOVER AND PERENNIAL BEDS ARE TO BE CONTAINED BY 4" x 14 GAUGE GREEN, ROLL TOP, INTERLOCKING TYPE EDGER , RYERSON OR EQUAL. EDGER IS NOT REQUIRED WHEN ADJACENT TO CURBS, WALLS, WALKS OR SOLID FENCES WITHIN 3" OF PRE-MULCHED FINAL GRADE. EDGER SHALL NOT BE REQUIRED TO SEPARATE MULCH TYPES UNLESS SPECIFIED ON THE PLANS.
18. ALL SHRUB BEDS ARE TO BE MULCHED WITH MIN.3" DEPTH, SHREDDED BARK NATURAL BROWN LANDSCAPE MULCH OVER SPECIFIED GEOTEXTILE WEED CONTROL FABRIC . ALL GROUND COVER AND PERENNIAL FLOWER BEDS SHALL BE MULCHED WITH 3" DEPTH
SHREDDED BARK NATURAL BROWN LANDSCAPE MULCH . NO WEED CONTROL FABRIC IS REQUIRED IN GROUNDCOVER OR PERENNIAL AREAS.
19. AT SEED AREA BOUNDARIES ADJACENT TO EXISTING NATIVE AREAS, OVERLAP ABUTTING NATIVE AREAS BY THE FULL WIDTH OF THE SEEDER.
20. EXISTING TURF AREAS THAT ARE DISTURBED DURING CONSTRUCTION, ESTABLISHMENT AND THE MAINTENANCE PERIOD SHALL BE RESTORED WITH NEW SOD TO MATCH EXISTING TURF SPECIES. DISTURBED NATIVE AREAS WHICH ARE TO REMAIN SHALL BE OVER SEEDED AND RESTORED WITH SPECIFIED SEED MIX.
21. CONTRACTOR SHALL OVER SEED ALL MAINTENANCE OR SERVICE ACCESS BENCHES AND ROADS WITH SPECIFIED SEED MIX UNLESS OTHERWISE NOTED ON THE PLANS.
22. ALL SEEDED SLOPES EXCEEDING 25% IN GRADE (4:1) SHALL RECEIVE EROSION CONTROL BLANKETS. PRIOR TO INSTALLATION, NOTIFY OWNER'S REPRESENTATIVE FOR APPROVAL OF LOCATION AND ANY ADDITIONAL COST IF A CHANGE ORDER IS NECESSARY.
23. WHEN COMPLETE, ALL GRADES SHALL BE WITHIN +/- 1/8" OF FINISHED GRADES AS SHOWN ON THE PLANS.
24. WHEN PLANTER URNS ARE SHOWN ON PLANS, CONTRACTOR SHALL INCLUDE THE FOLLOWING: PLANTER MIX, ANNUAL FLOWER PLANTING PROGRAM (INCLUDES 2 PLANTINGS FOR THE 1ST YEAR (SPRING AND FALL). UNLESS OTHERWISE SPECIFIED, CONTRACTOR TO PROVIDE ANNUAL PLANTING SELECTION FOR REVIEW BY OWNER. IRRIGATION FOR PLANTERS TO BE ON SEPARATE ZONE(S). CONTRACTOR TO COORDINATE PLACEMENT OF NECESSARY SLEEVING PRIOR TO PLACEMENT OF PAVEMENT.
25. PRIOR TO THE PLACEMENT OF MULCH AND WEED FABRIC, A GRANULAR, PRE-EMERGENT, WEED CONTROL AGENT SHALL BE ADDED TO ALL PLANTING BEDS IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTION, EXCEPT AROUND ORNAMENTAL GRASSES.
26. THE CONTRACTOR IS EXPECTED TO KNOW AND UNDERSTAND THE TOWN AND COUNTY SPECIFICATIONS FOR LANDSCAPE AND IRRIGATION. IN CASES OF DISCREPANCIES THE HIGHER OF THE TWO STANDARDS SHALL HAVE PRECEDENCE.
27. THE DEVELOPER, HIS SUCCESSORS AND ASSIGNS SHALL BE RESPONSIBLE FOR THE INSTALLATION, MAINTENANCE AND REPLACEMENT OF ALL IMPROVEMENTS SHOWN OR INDICATED ON THE APPROVED LANDSCAPE PLAN ON FILE IN THE PLANNING DEPARTMENT.

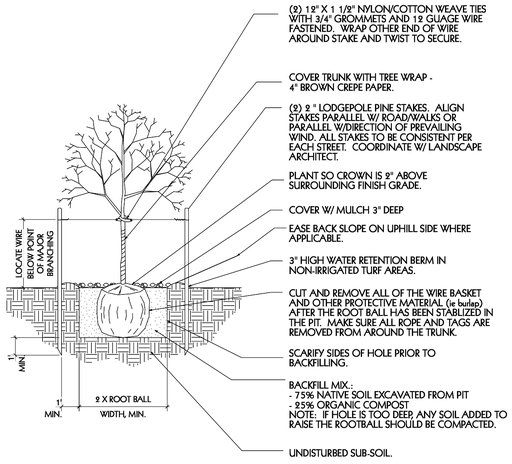
PLANT LIST: 03/11/2022

KEY	QTY	SCIENTIFIC NAME	COMMON NAME	SIZE % COND.	EXPOSURE	WATER	DIVERSITY
TREES:							
BP	7	Pinus aristata 'Formal Form	Formal Form Bristlecone Pine	6' ht	SUN	LOW	23%
HBS	4	Picea pungens 'Hoopsii'	Hoopsii Blue Spruce	3" cal. B&B	SUN	MED	13%
QA	15	Populus tremuloides	Quaking Aspen	3" cal. B&B	SUN	MED	48%
SCC	5	Prunus virginiana	Schubert Chokecherry	3" cal. B&B	SUN	MED	16%
TOTAL:	31						
SHRUBS:							
MKL	7	Syringa patula 'Miss Kim'	Miss Kim Lilac	#5 CONT.	SUN	LOW	17%
PC	12	Cotoneaster acutifolius	Peking Cotoneaster	#5 CONT.	SUN/PART	LOW-MED	29%
RBE	7	Sambucus pubens	Native Red Berried Elder	#5 CONT.	PART/SHADE	MED	17%
RTD	11	Cornus sericea 'Isanti'	Isanti Redtwig Dogwood	#5 CONT.	SUN	XERIC	27%
PM	4	Pinus mugo pumilio	Dwarf Mugo Pine	#5 CONT.	SUN/PART	MED	10%
TOTAL:	41						
PERENNIALS:							
DPD	16	Hemerocallis 'Purple de Oro'	Purple De Oro Daylily	#1 CONT.	SUN	MED	41%
SD	23	Leucanthemum x 'Becky'	Becky Shasta Daisy	#1 CONT.	SUN	LOW	59%
TOTAL:	39						

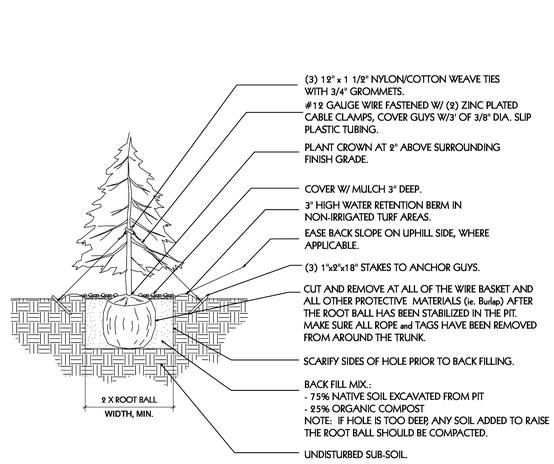
SHORT DRY GRASS SEED MIX	
COMMON NAME	% OF TOTAL
HARD FESCUE, VNS	30
CREEPING RED FESCUE, VNA	30
SHEEP FESCUE, MEKLENBERGER	25
CANADA BLUEGRASS, RUBENS	10
CANBY BLUEGRASS	5



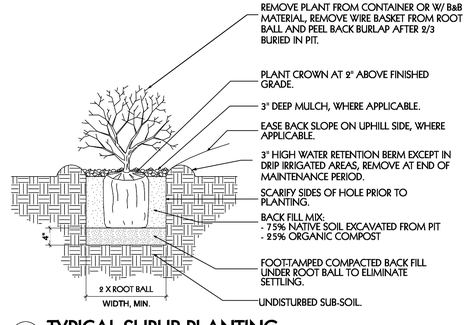
BLOCKY SANDSTONE BENCH
SCALE: NTS



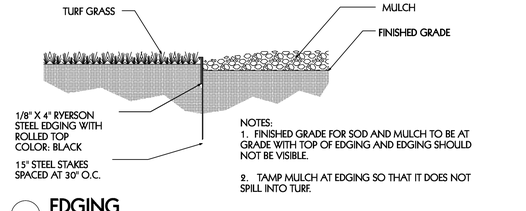
DECIDUOUS TREE PLANTING & STAKING
SCALE: NTS



EVERGREEN TREE PLANTING & STAKING
SCALE: NTS



TYPICAL SHRUB PLANTING
SCALE: NTS



EDGING
SCALE: NTS

outside la

outside L.A.
landscape architecture +
urban design +
planning

boulder / steamboat springs, co
p. 303.517.9256
osla@me.com

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

outside LA Project No: 3-22

Sheet Issue & Revision Log

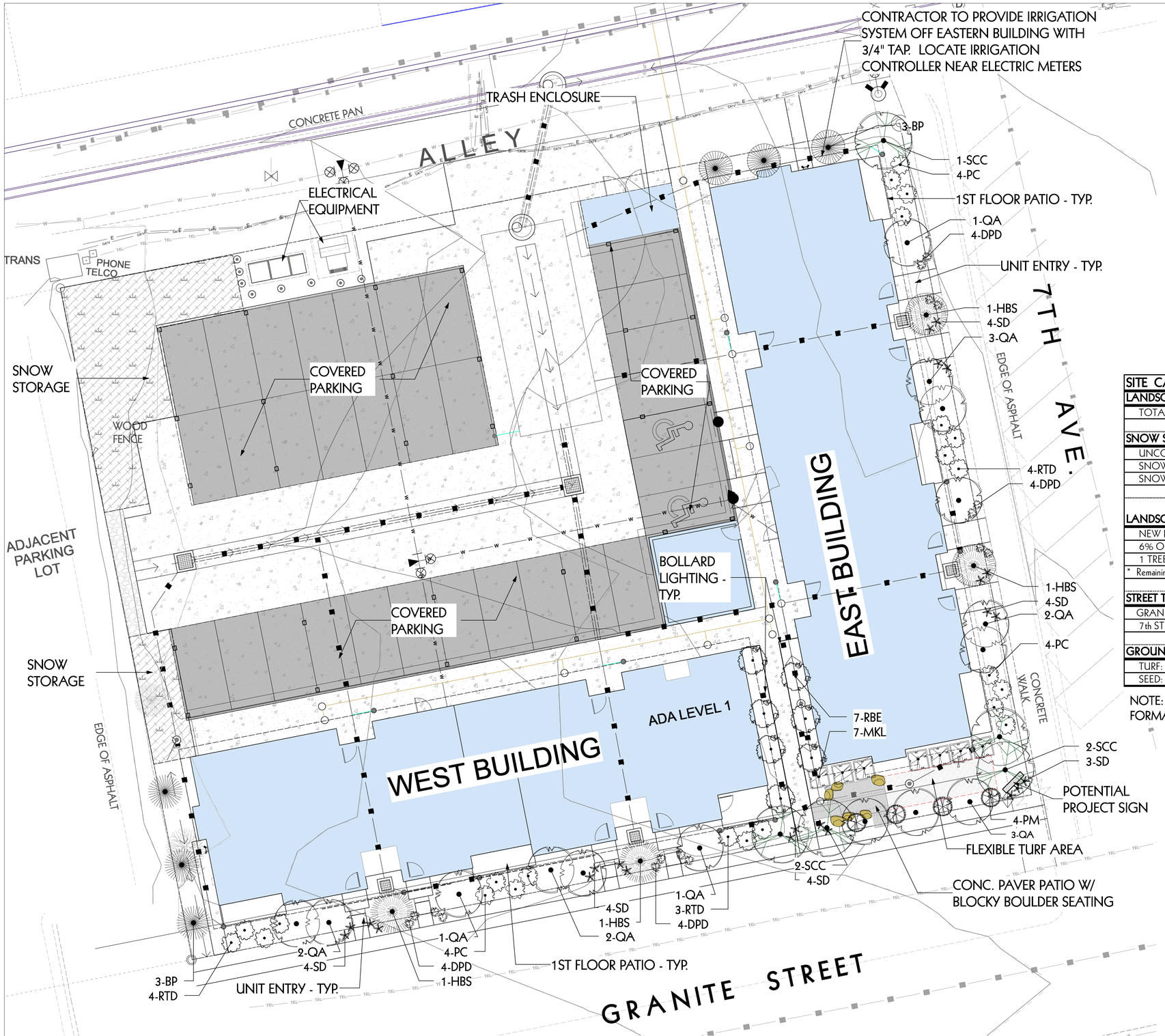
No	Date	Description
	03/25/22	BID SET

SG OSLA

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

LANDSCAPE NOTES & DETAILS

LG001



LEGEND

- DECIDUOUS CANOPY TREES
- EVERGREEN TREES
- SHRUBS
- PERENNIALS
- ROLLED TOP STEEL EDGER
- TURF - SOD
- NATIVE SEED MIX
- CONCRETE PAVERS (Basilite Plank Paver - Frisco color)
- SITE CONCRETE WALKS
- CRUSHED ROCK
- SNOW STORAGE AREA
- BLOCKY STONE SEATS

SITE CALCULATIONS: 10/26/21	
LANDSCAPE AREA CALCULATIONS:	
TOTAL LIMITS OF DISTURBED AREA:	24,480
SNOW STORAGE CALCULATIONS:	
UNCOVERED PARKING/PAVING	4,088
SNOW STORAGE REQUIRED	1,168
SNOW STORAGE PROVIDED	1,171
LANDSCAPE PARKING LOT CALCULATIONS:	
NEW PAVED PARKING:*	4,088
6% OF PAVED AREA:	246
1 TREE & 2 SHRUBS / 150 SF = 2 TREES &4 SHRUBS REQUIRED	0 provided
* Remaining parking lot covered with canopy	
STREET TREES (1/30LF frontage)	**PROVIDED**
GRANITE STREET: 175 LF = 6 TREES REQUIRED	13
7th STREET: 140 LF = 5 TREES REQUIRED	11
GROUND COVER:	**PROVIDED**
TURF: 160 SF	0.7%
SEED: 1150 SF	4.7%

NOTE: AREA DISTURBED BY GRADING OR CONSTRUCTION, NOT FORMALLY LANDSCAPED, SHALL BE REVEGETATED.

TOTAL LANDSCAPE REQUIREMENT			
REQUIREMENT		**TREE REQ.**	**SHRUB REQ.**
OVERALL SITE	24,480	28	17.00
	TOTAL REQUIRED	**28**	**31**
EXISTING		0	0
PROVIDED		28	41
	TOTAL	**28**	**41**

0 10 20 FT

SCALE: 1" =10'-0"

LANDSCAPE PLAN

outside la

outside L.A.
landscape architecture +
urban design +
planning

boulder / steamboat springs, co
p. 303.517.9256
osla@me.com

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

outside LA Project No: 3-22

Sheet Issue & Revision Log

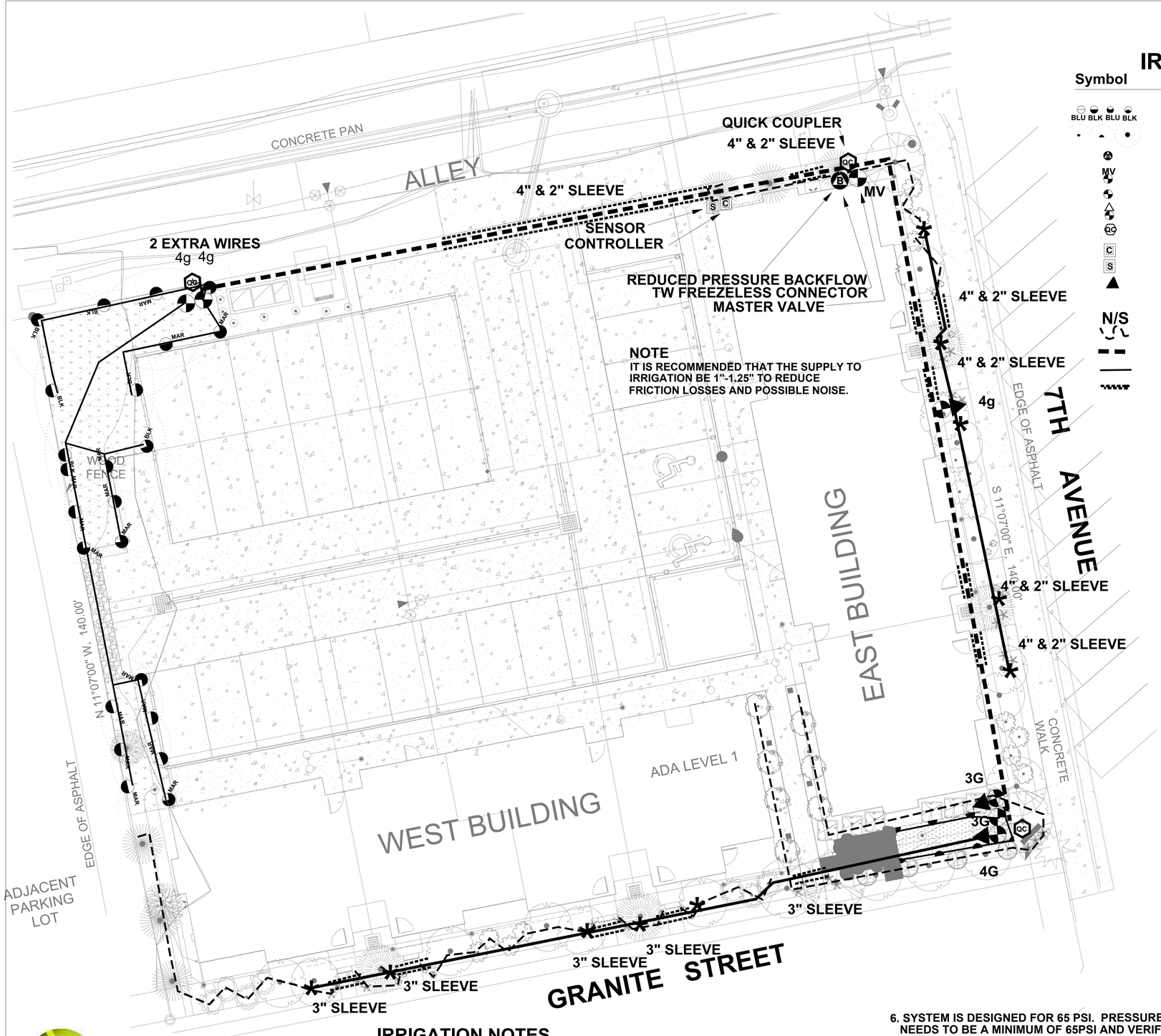
No	Date	Description
	03/25/22	BID SET

SG OSLA

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

LANDSCAPE PLAN

LG101



IRRIGATION LEGEND

Symbol	Description
BLU BLK BLU BLK	HUNTER MP ROTATORS W /HUNTER PROS-06-PRS40-CV
	HUNTER PROS-06-PRS30-CV
	FEBCO 825Y- 3/4" RP BACKFLOW WITHIN ENCLOSURE
MV	RAINBIRD PEB-100 MASTER VALVE
	RAINBIRD PEB-100 OR PEB-150
	Rain Bird XCZ-100 PRF DRIP VALVE
QC	RAINBIRD #33 QUICK COUPLER
C	HUNTER PRO-C CONTROLLER
S	HUNTER WIRELESS RAINCLIK SENSOR
	RAINBIRD OPERND ONE PER DRIP ZONE ONE PER EACH DRIP ZONE
N/S	DRIP END FLUSH ASSEMBLY
	DRIP . 3/4" UV POLYETHYLENE DRIP PIPE
	MAINLINE 1.25" CLASS 200 PVC
	LATERAL CLASS 200 PVC 1" UNLESS NOTED
	SLEEVES CLASS 200 AS NOTED

ALL WIRING SHALL BE #14UF

SPRAY NOZZLE SCHEDULE

5' OR LESS #5BLUE
5'-8' OR LESS #8 BROWN
8'-10' OR LESS #10 RED
10'-12' OR LESS #12 GREEN
12'-15' OR LESS #15 BLACK

MP ROTATOR NOZZLE SCHEDULE

8'-14' MP1000
13'-19' MP2000
19'-30' MP3000
30'-35' MP3500

N

0 5 10 20 30

1" = 10'

UNCC
UTILITY NOTIFICATION CENTER OF COLORADO
800-922-1987
www.uncc.org

PLOT DATE:

IRRIGATION NOTES

1. THE IRRIGATION SYSTEM UTILIZES POPUP SPRAY AND MP ROTATORS FOR TURF. AND A POINT SOURCE DRIP IRRIGATION SYSTEM FOR PLANTS NOT IN TURF.
2. IRRIGATION WATER IS SUPPLIED WITH A TAP OFF OF THE BUILDING WATER.
3. THE BACKFLOW PREVENTER SHALL BE OF THE REDUCED PRESSURE TYPE.
4. MAINLINE SHALL BE DRAINABLE AND THE ENTIRE SYSTEM SHALL BE BLOWNOUT PRIOR TO WINTER TEMPERATURES.
5. THE MAXIMUM ZONE SHALL NOT EXCEED 4 GALLONS PER MINUTE(GPM) AND IS THE LARGEST ZONE.
6. SYSTEM IS DESIGNED FOR 65 PSI. PRESSURE HAS NOT BEEN REPORTED. PRESSURE NEEDS TO BE A MINIMUM OF 65PSI AND VERIFIED. IMPORTANT: CONTRACTOR SHALL FURNISH A WRITTEN REPORT, SENT TO, AND ACKNOWLEDGED BY CONSULTANT, MEASURING STATIC WATER PRESSURE PRIOR TO START OF IRRIGATION CONSTRUCTION.
7. SYSTEMS UTILIZES A HUNTER PROC CONTROLLER. SYSTEMS SHALL BE EQUIPPED WITH RAIN/MOISTURE/FREEZE SENSORS.
8. THE DRIP SYSTEM SHALL CONSIST OF ONE 1 GALLON PER HOUR(GPH) EMITTER PER 1 GALLON SHRUB, TWO 1 GALLON EMITTERS FOR EACH 5 GALLON SHRUB AND FOUR TO SIX 1 GPH EMITTERS FOR EACH TREE DEPENDING ON SIZE AND TYPE.
9. REFER TO TOWN OF FRISCO DESIGN AND CONSTRUCTION STREETSCAPING STANDARDS.
10. REFER TO THE CIVIL ENGINEER DRAWINGS FOR GRADING AND UTILITY INFORMATION.

IRRIGATION PLAN

IRRIGATION PLAN
BY
WATER ENGINEERING, INC
17337 W. 53RD DR.
GOLDEN, COLORADO 80403
303-618-6307 FAX 303-474-3100
CARROLLEMAIL@AOL.COM

EPA WaterSense PARTNER

COPYRIGHT

outside la

outside L.A.
landscape architecture +
urban design +
planning

boulder / steamboat springs, co
p. 303.517.9256
osla@me.com

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

0" 1"

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

outside LA Project No: 3-22

Sheet Issue & Revision Log

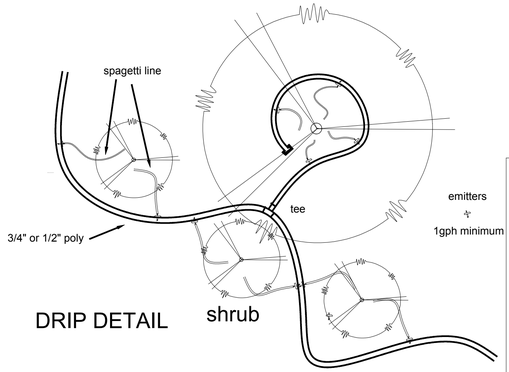
No	Date	Description
	03/25/22	BID SET

SG OSLA

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

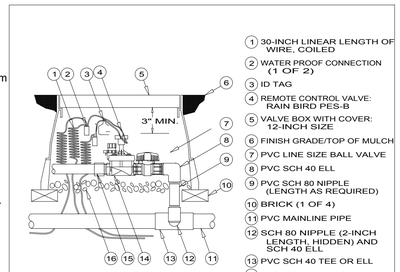
IRRIGATION PLAN

IG101



DRIP DETAIL

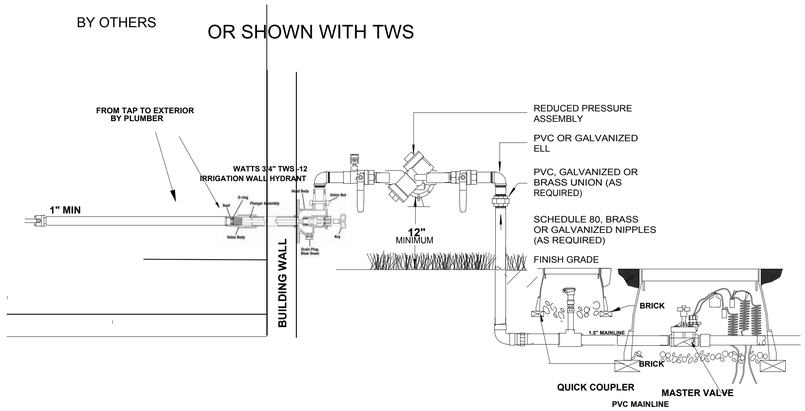
DRIP IN BED AREAS

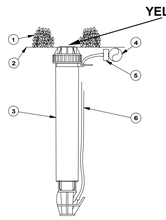


1. 30-INCH LINEAR LENGTH OF WIRE, COILED
2. WATER PROOF CONNECTION (1 OF 2)
3. ID TAG
4. REMOTE CONTROL VALVE: RAIN BIRD PES-B
5. VALVE BOX WITH COVER: 12-INCH SIZE
6. FINISH GRADE/TOP OF MULCH
7. PVC LINE SIZE BALL VALVE
8. PVC SCH 40 ELL
9. PVC SCH 80 NIPPLE (LENGTH AS REQUIRED)
10. BRICK (1 OF 4)
11. PVC MAINLINE PIPE
12. SCH 80 NIPPLE (2-INCH LENGTH, HIDDEN) AND SCH 40 ELL
13. PVC SCH 40 TEE OR ELL
14. PVC SCH 40 MALE ADAPTER
15. PVC LATERAL PIPE
16. 3.0-INCH MINIMUM DEPTH OF 3/4-INCH WASHED GRAVEL

D REMOTE CONTROL VALVE

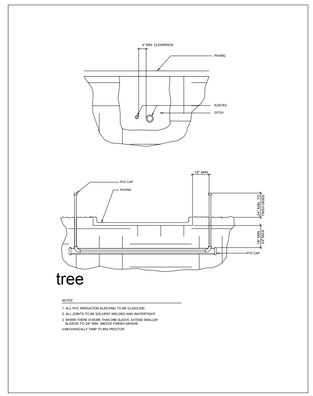
IRRIGATION BACKFLOW AND SUPPLY CONFIGURATION WITH TWS BY BUILDING PLUMBER





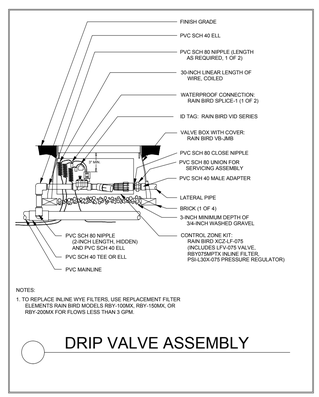
1. PLANT MATERIAL
2. FINISH GRADE
3. MICRO-SPRAY POP-UP: RAIN BIRD XERI-POP XP-600X
4. ¼" POLYETHYLENE TUBING: RAIN BIRD XF SERIES TUBING OR RAIN BIRD XT-700 XERI-TUBE OR RAIN BIRD XBS BLACK STRIPE TUBING
5. ¼" SELF-PIERCING BARB CONNECTOR: RAIN BIRD SPB-025
6. ¼" DISTRIBUTION TUBING: RAIN BIRD XQ TUBING (LENGTH AS REQUIRED)

DRIP SYSTEM OPERATION INDICATOR OPERIND



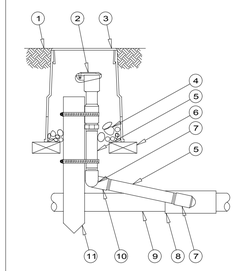
NOTES
1. ALL PVC IRRIGATION SLEEVING TO BE CLASS 200.
2. ALL JOINTS TO BE SCH 40/40 WELDED AND WATERTIGHT.
3. SLEEVE SHALL BE INSTALLED PRIOR TO PAVING INSTALLER SLEEVE TO BE MIN. ABOVE FINISH GRADE.
4.MECHANICALLY TAMP TO 95% PROCTOR.

IRRIGATION SLEEVING



NOTES:
1. TO REPLACE INLINE WYE FILTERS, USE REPLACEMENT FILTER ELEMENTS RAIN BIRD MODELS RBY-150MX, RBY-150MX, OR RBY-200MX FOR FLOWS LESS THAN 3 GPM.

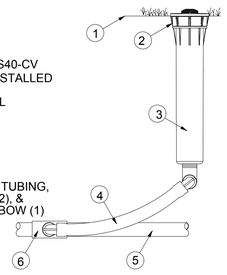
DRIP VALVE ASSEMBLY



1. FINISH GRADE/TOP OF MULCH
2. QUICK-COUPLING VALVE:
3. VALVE BOX WITH COVER: 6-INCH SIZE
4. 3-INCH MINIMUM DEPTH OF 3/4-INCH WASHED GRAVEL
5. PVC SCH 80 NIPPLE (LENGTH AS REQUIRED)
6. BRICK (1 OF 2)
7. PVC SCH 40 STREET ELL
8. PVC SCH 40 TEE OR ELL
9. PVC MAINLINE PIPE
10. PVC SCH 40 ELL
11. 2" x 2" REDWOOD STAKE W/ STAINLESS STEEL GEAR CLAMPS OR EQUIVALENT SUPPORT SYSTEM

NOTE:
1. FURNISH FITTINGS AND PIPING NOMINALLY SIZED IDENTICAL TO NOMINAL QUICK COUPLING VALVE INLET SIZE.

D QUICK-COUPLING VALVE

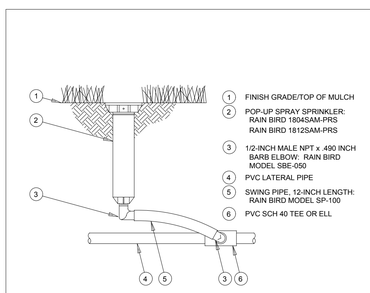


1 FINISH GRADE
2 MODEL PROS-06-PRS40-CV
3 WITH 'CV' OPTION INSTALLED
6 LATERAL TEE OR ELL
5 LATERAL PIPE

SWING JOINT:
HUNTER 'PRO-FLEX' TUBING, HSBE-050 ELBOWS (2), & MARLEX STREET ELBOW (1)

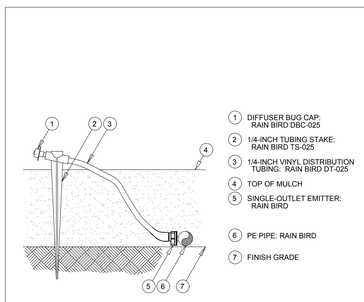
PROS-06-PRS40-CV
MP ROTATOR SPRINKLER

XX SCALE: 3" = 1'-0" Hunter IRRIGATION DETAIL



1. FINISH GRADE/TOP OF MULCH
2. POP-UP SPRAY SPRINKLER: RAIN BIRD 1804SAM-PRS RAIN BIRD 1812SAM-PRS
3. 1/2-INCH MALE NPT x .490 INCH BARB ELBOW: RAIN BIRD MODEL SBE-050
4. PVC LATERAL PIPE
5. SWING PIPE, 12-INCH LENGTH: RAIN BIRD MODEL SP-100
6. PVC SCH 40 TEE OR ELL

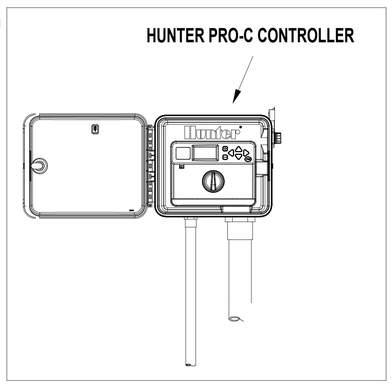
D POP-UP SPRAY SPRINKLER

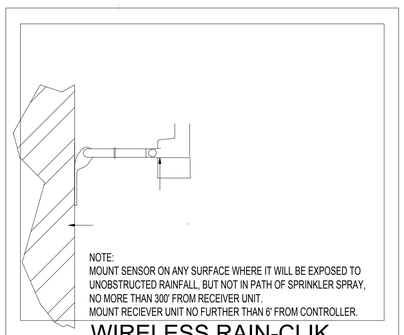


1. DIFFUSER BUG CAP: RAIN BIRD DBC-025
2. 1/4-INCH TUBING STAKE: RAIN BIRD TS-025
3. 1/4-INCH VINYL DISTRIBUTION TUBING: RAIN BIRD DT-025
4. TOP OF MULCH
5. SINGLE-OUTLET EMITTER: RAIN BIRD
6. PE PIPE: RAIN BIRD
7. FINISH GRADE

NOTE:
1. USE RAIN BIRD BUG GUN MODEL EMA-BG TO INSERT EMITTER DIRECTLY INTO XERI-TUBE OR RAIN TUBE TUBING.

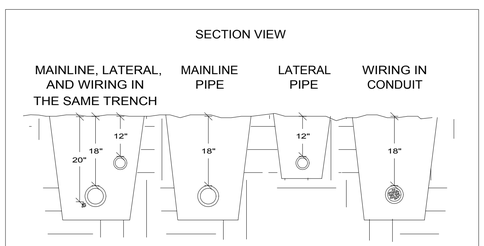
D EMITTER INTO XERI-TUBE



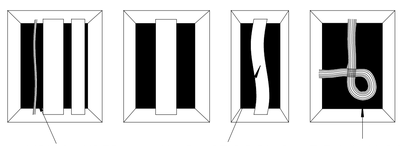


WIRELESS RAIN-CLIK

I RAIN SENSOR



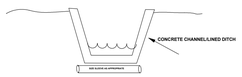
PLAN VIEW



RUN WIRING UNDER MAINLINE, TAPE AND BUNDLE AT 10' O.C.

ALL PLASTIC PIPING TO BE SNAKED IN TRENCH AS SHOWN

TIE A 24" LOOP IN ALL WIRING AT CHANGES OF DIRECTION OF 30ø UNTIE AFTER ALL CONNECTIONS HAVE BEEN MADE.



DITCH CROSSING BURRITO KITCHEN

NOTE:
SLEEVE BELOW ALL HARDSCAPE ELEMENTS WITH SCHEDULE 40 PVC 2 TIMES THE DIAMETER OF THE PIPE WITHIN.

PIPE & WIRE TRENCHING

IRRIGATION DETAILS

IRRIGATION PLAN BY
WATER ENGINEERING, INC
17337 W. 53RD DR.
GOLDEN, COLORADO 80403
303-618-6307 FAX 303-474-3100
CARROLLEMAIL@AOL.COM

outside L.A.
landscape architecture + urban design + planning

boulder / steamboat springs, co
p. 303.517.9256
osla@me.com

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

0" 1" THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

outside LA Project No: 3-22

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

SG OSLA

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

IRRIGATION DETAILS

IG501

PLOT DATE:

COPYRIGHT ©

STANDARDS

- ALL DESIGN HAS BEEN COMPLETED IN ACCORDANCE WITH THESE STANDARDS.
- ALL CONSTRUCTION SHALL CONFORM TO THE REQUIREMENTS OF THE CITED VERSION OF THE FOLLOWING STANDARDS REFERENCED IN THE BUILDING CODE.

PROJECT SCOPE	THESE STRUCTURAL DRAWINGS MAY ONLY BE USED TO CONSTRUCT THE PROJECT LOCATED AT 619 GRANITE STREET IN FRISCO, COLORADO
BUILDING CODE	2018 INTERNATIONAL BUILDING CODE & REQUIREMENTS OF TOWN OF FRISCO
GEOTECHNICAL REPORT	REPORT PREPARED BY KUMAR & ASSOCIATES, INC OF SILVERTHORNE, CO, DATED NOVEMBER 27,2020 (REPORT 20-6-254)
STRUCTURAL LOADS	ASCE-7 "MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES"
CONCRETE	ACI 301: "SPECIFICATIONS FOR STRUCTURAL CONCRETE BUILDINGS" ACI 318: "BUILDING CODE REQUIREMENTS FOR STRUCURAL CONCRETE AND COMMENTARY" ACI 306: "GUIDE TO COLD WEATHER CONCRETING" ACI SP 66: "ACI DETAILING MANUAL" ACI 117: "SPECIFICATION FOR TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS" PORTLAND CEMENT ASSOCIATION "DESIGN AND CONTROL OF CONCRETE MIXTURES" CRSI'S "MANUAL OF STANDARD PRACTICE"
STEEL	ANSI/AISC 360: "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS" AISC 303: "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" RCSC: "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS"
WELDING	AWS D1.1/D1.1M: "STRUCTURAL WELDING CODE-STEEL" AWS D1.4: "STRUCTURAL WELDING CODE-REINFORCING STEEL" AWS D9.1: "SHEET METAL WELDING CODE"
WOOD	ANSI/AF&PA NDS "NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION"
WOOD TRUSSES	TRUSS PLATE INSTITUTE PUBLICATION "HIB-91 COMMENTARY & RECOMMENDATIONS FOR HANDLING, INSTALLING, & BRACING METAL PLATE CONNECTED WOOD TRUSSES"

DESIGN LOADS

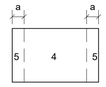
ALL LOADS ARE SUBJECT TO MODIFICATION PER REQUIREMENTS OF ASCE-7

	RISK CATEGORY	II
LIVE		UNIFORM (PSF) | CONCENTRATED (LB)
	CORRIDORS: FIRST FLOOR	100 | ---
	CORRIDORS: OTHER FLOORS	SAME AS OCCUPANCY SERVED
	RESIDENTIAL: UNINHABITABLE ATTICS W/O STORAGE	10 | ---
	RESIDENTIAL: UNINHABITABLE ATTICS W/ STORAGE	20 | ---
	RESIDENTIAL: PRIVATE ROOMS & CORRIDORS SERVING THEM	40 | ---
	RESIDENTIAL: PUBLIC ROOMS & CORRIDORS SERVING THEM	40 | ---
	ROOFS: SURFACES SUBJECT TO MAINTENANCE WORKERS	--- | 300
	ROOFS: ALL OTHER CONSTRUCTION	20 | ---
	STAIRS & EXITS: ONE & TWO-FAMILY DWELLINGS	40 | 300
	STAIRS & EXITS: ALL OTHER	100 | 300
SEISMIC	SEISMIC IMPORTANCE FACTOR	Ie = 1.0
	SITE CLASSIFICATION OF SOIL	D
	1.0 SECOND SPECTRAL RESPONSE	S1 = 0.083
		Fv = 2.4
		SD1 = 0.133
	0.2 SECOND SPECTRAL RESPONSE	Ss = 0.325
		Fa = 1.6
		SDS = 0.316
	SEISMIC DESIGN CATEGORY	B
	LATERAL RESISTING SYSTEM	LIGHT-FRAME (WOOD) WALLS SHEATHED W/ WOOD STRUCTURAL PANELS RATED FOR SHEAR RESISTANCE
	SEISMIC RESPONSE COEFFICIENT	Cs = 0.0487
	RESPONSE MODIFICATION FACTOR	R = 6.5
	ANALYSIS PROCEDURE USED	EQUIVALENT LATERAL FORCE PROCEDURE
	DESIGN BASE SHEAR	V = 45.19 KIPS
SNOW	GROUND SNOW	Pg = 80 PSF
	IMPORTANCE FACTOR	Is = 1.0
	EXPOSURE FACTOR	Ce = 1.0
	THERMAL FACTOR	Ct = 1.0
	FLAT ROOF SNOW LOAD	Pf = 56 PSF
	DRIFT SNOW LOAD	MAPPED ON PLAN
	FROST DEPTH	40 IN
WIND	BASIC WIND SPEED (3-SEC)	V = 90 MPH
	EXPOSURE CATEGORY	B
	TOPOGRAPHIC FACTOR	Kzt = 1.0
	INTERNAL PRESSURE COEFFICIENT	(GCpi) = ±0.18
	ENCLOSURE CLASSIFICATION	ENCLOSED

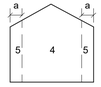
COMPONENT & CLADDING WIND LOADS

- PLUS AND MINUS SIGNS SIGNIFY PRESSURES ACTING TOWARD AND AWAY FROM THE SURFACES, RESPECTIVELY.
- EACH COMPONENT SHALL BE DESIGNED FOR MAXIMUM POSITIVE AND NEGATIVE PRESSURES.
- DISTANCE a = 10% OF LEAST HORIZONTAL DIMENSION OR 0.4h, WHICHEVER IS SMALLER, BUT NOT LESS THAN EITHER 4% OF LEAST HORIZONTAL DIMENSION OR 3 FT.
- h = MEAN ROOF HEIGHT, IN FT, EXCEPT THAT EAVE HEIGHT SHALL BE USED FOR ROOF SLOPE LESS THAN OR EQUAL TO 10%
- LINEAR INTERPOLATION OF WIND LOADS FOR AREAS BETWEEN THOSE IN TABLE IS NOT ACCEPTABLE.

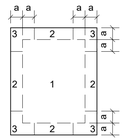
ZONE	EFFECTIVE WIND AREA (FT²) LESS THAN 10	100	GREATER THAN 500
ROOF 1	8.62/-13.69	6.09/-12.43	-
ROOF 2	8.62/-23.84	6.09/-17.50	-
ROOF 3	8.62/-35.25	6.09/-27.64	-
WALL 4	14.96/-16.23	-	11.16/-12.43
WALL 5	14.96/-20.03	-	11.16/-12.43



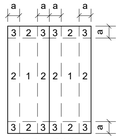
WALL



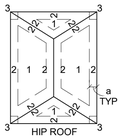
WALL



FLAT ROOF



GABLE ROOF



HIP ROOF

MATERIALS

SOIL	SOIL SUPPORTING SHALLOW FOUNDATIONS	2,500 PSF MAX ALLOWABLE BRG CAPACITY (DEAD LOAD PLUS FULL LIVE LOAD)
	LATERAL AT-REST PRESSURE EFP	50 PCF
	LATERAL ACTIVE PRESSURE EFP	40 PCF
	PASSIVE PRESSURE	460 PCF
	CO-EFFICIENT OF FRICTION	0.45
REINFORCING	REINF #4 AND LARGER	ASTM A615 (GRADE 60)
	#3 REINF	ASTM A615 (GRADE 40)
	BARS TO BE WELDED	ASTM A706 (GRADE 60)
	WELDED WIRE FABRIC	ASTM A1064 FLAT SHEETS
	SYNTHETIC FIBER REINFORCING	ASTM C1116 (TUF-STRAND BY EUCID OR EQUAL)
STEEL	W-SHAPES	ASTM A992 - FY = 50 KSI
	CHANNELS, ANGLES, PLATES	ASTM A36 - FY = 36 KSI
	HSS ROUND	ASTM A500 TYPE B - FY = 42 KSI
	HSS RECTANGULAR, SQUARE	ASTM A500 TYPE B - FY = 46 KSI
	STRUCTURAL STEEL PIPE	ASTM A53 TYPE E OR S GRADE B - FY = 35 KSI
	STRUCTURAL STEEL BOLTS	ASTM A325-N
	WASHERS	ASTM F436 HARDENED WASHER
	NUTS	ASTM A563
	WELDING ELECTRODES (E-70 SERIES)	ASTM A233
	GROUT BELOW PLATES	NON-SHRINK, NON-METALLIC (5000 PSI)
	ANCHOR RODS	ASTM F1554 GRADE 36 THREADED RODS (UNO)
	EPOXY BOLTS	EPOXY - HILTI HIT-RE 500-V3 INJECTABLE MORTAR WITH THREADED RODS
	HEADED STEEL STUDS	ASTM A108-GRADE 1010-1020, WELDED IN ACCORDANCE WITH CHAPER 7 OF ANSI/AWS D1.1
	THREADED RODS	ASTM A36 (UNO)
WOOD	DIMENSIONAL LUMBER (2" NOMINAL WIDTH)	DOULAS FIR-LARCH NO.2 UNO (19%) MAX MOISTURE CONTENT)
	DIMENSIONAL LUMBER (GREATER THAN 2" WIDTH)	DOUGLAS FIR-LARCH NO.1 UNO (19% MAX MOISTURE CONTENT)
	STUD LUMBER	HEM FIR NO. 2 STUD GRADE (19% MAX MOISTURE CONTENT)
	I-JOIST CHORDS	MIN. Fb = 1,700 PSI, Fv = 190 PSI, Fc, perp = 680 PSI
	LAMINATED VENEER LUMBER (LVL)	MIN. Fb = 2,600 PSI, Fv = 285 PSI, Fc, perp = 750 PSI, E = 1,900,000 PSI
	LAMINATED STRAND LUMBER (LSL)	STUDS: MIN. Fb = 1,700 PSI, Fv = 400 PSI, Fc,para = 1 ,400 PSI, E = 1,300,000 PSI BEAMS: MIN. Fb=2325 PSI, Fv=310 PSI, Fc,perp=900 PSI, E=1,550,000 PSI
	LAMINATED STRAND RIM MEMBERS (1 1/4" WIDE)	MIN. Fb = 1,700 PSI, Fv = 425 PSI, Fc,para = 1,835 PSI, E = 1,300,000 PSI
	ROOF TRUSS LUMBER	DOUGLAS FIR-LARCH OR SPRUCE-PINE-FIR NO.1 (MAX 19% MOISTURE CONTENT)
	BOLTS FOR WOOD CONSTRUCTION	ASTM A307
	TOP MOUNT HANGERS	SIMPSON HU-TF, B, OR IT (I-JOISTS) SERIES OR EQUIVALENT
	FACE MOUNT HANGERS	SIMPSON LU, HU, OR IU (I-JOISTS) SERIES OR EQUVALENT
	SHEATHING	APA RATED EXPOSURE 1, DOC PS1 OR PS2

SUBMITTALS

- THE APPROVAL OF THE STRUCTURAL ENGINEER OF RECORD MUST BE SECURED ON ALL STRUCTURAL SUBMITTALS.
- DO NOT REPRODUCE CONTRACT DOCUMENTS OR COPY STANDARD PRINTED INFORMATION AS THE BASIS OF SHOP DRAWINGS
- CONTRACTOR SHALL REVIEW AND STAMP ALL SHOP DRAWINGS PRIOR TO SUBMITTAL. ANY ITEMS NOT IN ACCORDANCE WITH THE CONTRACT DOCUMENTS SHALL BE FLAGGED BY THE CONTRACTOR.
- THE SHOP DRAWINGS DO NOT REPLACE THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL MAKE SURE THE STRUCTURE IS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
- ALL DIMENSIONS AND ELEVATIONS TO BE VERIFIED BY THE GENERAL CONTRACTOR IN ACCORDANCE W/ ALL CONTRACT DOCUMENTS.
- INCLUDE CALCULATIONS STAMPED AND SIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN JURISDICTION HAVING AUTHORITY OVER THE PROJECT FOR ALL DEFERRED SUBMITTAL ITEMS
- ALLOW A MINIMUM OF TWO WEEKS FOR ENGINEER REVIEW, PRIOR TO FABRICATION OR CONSTRUCTION.

CONCRETE	REINF SCHEDULE REINF ELEVATIONS STEEL EMBED DRAWINGS PRODUCT DATA CONCRETE MIX DESIGNS SUBMITTALS REQUIRED BY ACI 301
WOOD	FOREST STEWARDSHIP COUNCIL CERTIIFICATION HEAVY TIMBER LAYOUT
PRE-ENGINEERED WOOD	ROOF TRUSS LAYOUT FLOOR TRUSS LAYOUT DETAILS INCLUDING BRACING & HANGERS CONNECTION DETAILS
STRUCTURAL STEEL	SHOP DRAWINGS INCLUDING ANCHOR BOLT LAYOUT & DETAILS MILL CERTIFICATES WELDING CERTIFICATES SUBMITTALS REQUIRED BY AISC "MANUAL OF STEEL CONSTRUCTION" PROPER INSTALLATION OF SNUG-TIGHT OR SLIP-CRITICAL HIGH STRENGTH BOLTS PROPER INSTALLATION OF A325-X HIGH STRENGTH BOLTS

SPECIAL INSPECTION AND OBSERVATION STRUCTURAL ELEMENTS

- SPECIAL STRUCTURAL INSPECTIONS SHALL COMPLY WITH CHAPTER 17 OF THE INTERNATIONAL BUILDING CODE REFERENCED IN THESE DOCUMENTS.
- SPECIAL INSPECTOR SHALL BE EMPLOYED DIRECTLY BY THE OWNER.
- COORDINATE WITH ARCHITECTURAL AND MEP DRAWINGS FOR SPECIAL INSPECTIONS AND TESTING OF NON-STRUCTURAL ELEMENTS.
- TESTS AND INSPECTIONS SHALL COMPLY WITH THE REQUIREMENTS OF THE REFERENCED STANDARDS.
- SPECIAL STRUCTURAL INSPECTION IS REQUIRED IN ADDITION TO ANY INSPECTIONS REQUIRED BY THE JURISDICTION HAVING AUTHORITY OVER THE PROJECT SITE.
- SPECIAL STRUCTURAL INSPECTIONS SHALL BE PERFORMED ON, BUT ARE NOT LIMITED TO THE ITEMS INDICATED IN THE SPECIAL STRUCTURAL INSPECTION SCHEDULE.
- THE CONTRACTOR SHALL PROVIDE SAFE ACCESS TO ALL ITEMS REQUIRING SPECIAL STRUCTURAL INSPECTION.

DUTIES AND RESPONSIBILITIES OF THE SPECIAL STRUCTURAL INSPECTOR:

THE SPECIAL STRUCTURAL INSPECTOR:

- SHALL OBSERVE THE WORK ASSIGNED FOR CONFORMANCE TO THE APPROVED DESIGN DRAWINGS AND SPECIFICATIONS.
- SHALL REPORT TO THE CONTRACTOR UPON ARRIVING ON SITE TO DETERMINE WHETHER ANY DESIGN TEAM COMMUNICATIONS TO THE CONTRACTOR AFFECT THE WORK TO BE REVIEWED. THE SPECIAL STRUCTURAL INSPECTOR SHALL LEAVE A COPY OF EACH REPORT WITH THE CONTRACTOR UPON LEAVING SITE.
- SHALL FURNISH INSPECTION REPORTS TO THE BUILDING OFFICIAL, THE ENGINEER OR ARCHITECT OF RECORD, AND OTHER DESIGNATED PERSONS WITHIN 24 HOURS. ALL DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION, THEN, IF UNCORRECTED, TO THE PROPER DESIGN AUTHORITY AND TO THE BUILDING OFFICIAL.
- SHALL SUBMIT A FINAL SIGNED REPORT STATING WHETHER THE WORK REQUIRING SPECIAL INSPECTION WAS, TO THE BEST OF THE INSPECTOR'S KNOWLEDGE, IN CONFORMANCE TO THE APPROVED PLANS AND SPECIFICATIONS AND THE APPLICABLE WORKMANSHIP PROVISIONS OF THE CODE.
- IS NOT AUTHORIZED TO APPROVE ANY CHANGES TO THE CONTRACT DOCUMENTS. ANY VARIATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE CONTRACTOR AND ENGINEER OR ARCHITECT OF RECORD.

SPECIAL STRUCTURAL INSPECTION SCHEDULE

LEGEND:
C = CONTINUOUS SPECIAL INSPECTION
P = PERIODIC SPECIAL INSPECTION

STRUCTURAL STEEL	P	COMPLIANCE OF MATERIALS SPECIFIED
	P	COMPLIANCE OF INSTALLED CONNECTIONS TO CONSTRUCTION DOCUMENTS
	P	MANUFACTURER'S CERTIFIED TEST REPORTS
STRUCTURAL WELDING		NON-DESTRUCTIVELY TEST 100% GROOVE WELDS
		VISUALLY INSPECT ALL SHOP FABRICATION AND FIELD WELDS
		NON-DESTRUCTIVELY TEST 20% FILLET WELDS (IF NON SINGLE-PASS WELDS), IF MORE THAN 10% FAIL, TEST ALL FILLET WELDS
		VERIFY CURRENT WELDER'S CERTIFICATION
HIGH STRENGTH BOLTING		VERIFY SNUG TIGHT OR SLIP-CRITICAL INSTALLATIONS PER PLANS
		VERIFY INSTALLATION OF A325-N AND A490-N BOLTS PER PLAN
CONCRETE	P	VERIFY USE OF REQUIRED DESIGN MIX
	C	FABRICATE SPECIMEN FOR COMPRESSIVE STRENGTH TESTS
	C	PERFORM SLUMP, AIR CONTENT, AND TEMPERATURE TESTS
	P	REINFORCING STEEL SIZE AND POSITIONS PRIOR TO CONCRETE POUR
	C	SHEAR REINFORCEMENT
	P	INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED
	P	INSPECT ANCHOR RODS AND EMBED PLATES POSITION PRIOR TO CONCRETE POUR
	P	INSPECT ANCHORS POST-INSTALLED IN HARDENED CONCRETE
	P	PLACEMENT OF CONCRETE
	P	VERIFY WELDABILITY OF REINFORCING STEEL OTHER THAN ASTM A706
	P	INSPECT REINFORCING STEEL SINGLE-PASS FILLET WELDS UP TO 5/16"
	C	INSPECT ALL OTHER WELDS
	P	INSPECT ANCHORS CAST IN CONCRETE
	C	INSPECT ADHESIVE ANCHORS INSTALLED IN HORIZONTALLY OR UPWARDLY INCLINED ORIENTATIONS
	P	INSPECT MECHANICAL AND ADHESIVE ANCHORS
	P	PREPARATION, CONSTRUCTION AND PROTECTION OF CONCRETE DURING COLD OR HOT WEATHER
WOOD		FABRICATION PROCESSES OF WOOD STRUCTURAL ELEMENTS AND ASSEMBLIES
		TEMPORARY AND PERMANENT RESTRAINT/ BRACING OF METAL-PLATE-CONNECTED TRUSSES SPANNING MORE THAN 60 FEET
		FOR HIGH-LOAD DIAPHRAGMS: GRADE AND THICKNESS OF SHEATHING, NOMINAL SIZE OF FRAMING MEMBER AT ADJOINING PANEL FASTENER, SIZE, LENGTH SPACING
		FOR SHEAR WALLS: GRADE AND THICKNESS OF SHEATHING, NOMINAL SIZE OF FRAMING MEMBER AT ADJOINING PANEL, FASTENER SIZE, LENGTH, SPACING
SOILS	P	VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY
	P	VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTHS AND HAVE REACHED PROPER MATERIAL
	P	PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS
	C	VERIFY USE OF PROPER MATERIALS, DENSITIES, AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL
	P	PRIOR TO PLACEMENT OF COMPACTED FILL, INSPECT SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY
	P	SIZE AND LOCATION OF STRUCTURAL ELEMENTS
	C	TYPE, SIZE AND LOCATION OF ANCHORS, INCLUDING OTHER DETAILS OF ANCHORAGE OF MASONRY TO STRUCTURAL MEMBERS, FRAMES, OR OTHER CONSTRUCTION
	C	WELDING OF REINFORCEMENT
	P	PREPARATION, CONSTRUCTION AND PROTECTION OF MASONRY DURING COLD AND HOT WEATHER PLACEMENT
	C	PREPARATION OF GROUT SPECIMENS, MORTAR SPECIMENS, AND/OR PRISMS
WIND RESISTING SYSTEM		WOOD SHEAR WALL AND DIAPHRAGM SYSTEMS:
EXP B & V asd ≥ 120 MPH	C	FIELD GLUING OF WOOD SHEATHING
EXP C & D & V asd ≥ 110 MPH	P	NAILING, BOLTING, ANCHORING OF WOOD ELEMENTS
	P	ROOF COVERING, DECK AND FRAMING CONNECTIONS
	P	EXTERIOR WALL COVERING AND CONNECTION TO ROOF AND FLOOR DIAPHRAGMS

SHEET LIST

NUMBER	NAME	09/02/2021 100% DD	12/01/2021 90% CD	02/28/2022 90% CD	03/14/2022 PERMIT
SG000	GENERAL NOTES	•	•		•
SG001	GENERAL NOTES	•	•	•	•
SG002	ABBREVIATIONS, SYMBOLS, LEGENDS & SCHEDULES	•	•	•	•
SG003	GRAPHICAL GENERAL NOTES	•	•	•	•
SG004	GRAPHICAL GENERAL NOTES	•	•	•	•
SG005	GRAPHICAL GENERAL NOTES	•	•	•	•
SG006	GRAPHICAL GENERAL NOTES	•	•	•	•
SE100	SNOW LOAD PLANS	•	•	•	•
SE101	FOUNDATION & LEVEL 2 PLAN - EAST BUILDING	•	•	•	•
SE102	LEVEL 3 & ROOF PLAN - EAST BUILDING	•	•	•	•
SE201	FOUNDATION ISOMETRIC VIEWS	•	•	•	•
SE202	FRAMING ISOMETRIC VIEWS	•	•	•	•
SE501	FOUNDATION DETAILS		•	•	•
SE502	FRAMING DETAILS		•	•	•

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

Studio NYL
2995 Baseline Road, #314 303.558.3145
Boulder, Colorado 80303 www.studionyl.com
Boulder | Denver | Colorado Springs | Kestrel | Minneapolis

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21009

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

GENERAL NOTES

SG000

COPYRIGHT©

PLOT DATE: 3/22/2022 10:40:45 AM

GENERAL NOTES

CONSTRUCTION METHOD:
A. THE STRUCTURAL DRAWINGS REPRESENT THE FINAL STRUCTURE. THE STRUCTURAL DRAWINGS DO NOT INDICATE THE CONTRACTORS MEANS, METHODS, TECHNIQUES, SEQUENCES OF CONSTRUCTION AND JOB SITE SAFETY. THE ENGINEER OF RECORD IS NOT RESPONSIBLE FOR THE CONTRACTOR'S FAILURE TO FOLLOW PLANS, SPECIFICATIONS, AND/OR ENGINEERING RECOMMENDATIONS, NOR IS THE ENGINEER OF RECORD RESPONSIBLE FOR ECONOMIC LOSS AND/OR DELAYS OF THE CONTRACTOR OR SUBCONTRACTORS.
B. ALL CONSTRUCTION SHALL BE ADEQUATELY BRACED TO PREVENT DISTORTION AND DAMAGE DUE TO CONSTRUCTION LOADS AND NATURAL FORCES.
C. THE CONTRACTOR SHALL MAKE ALLOWANCES FOR DIFFERENCE BETWEEN TEMPERATURE DURING ERECTION AND MEAN TEMPERATURE WHEN STRUCTURE IS COMPLETED AND IN SERVICE

LETTERS OF CONSTRUCTION CONFORMANCE TO DESIGN INTENT:
A. THE CONTRACTOR SHALL DETERMINE FROM THE LOCAL BUILDING OFFICIAL AT THE TIME THE BUILDING PERMIT IS OBTAINED WHETHER ANY LETTERS OF CONSTRUCTION CONFORMANCE TO DESIGN INTENT WILL BE REQUESTED FROM THE STRUCTURAL ENGINEER.
B. THE CONTRACTOR SHALL NOTIFY THE STRUCTURAL ENGINEER OF ALL SUCH REQUIREMENTS IN WRITING BEFORE THE START OF CONSTRUCTION.
C. TWO-DAYS ADVANCE NOTICE SHALL BE GIVEN WHEN REQUESTING SITE VISITS NECESSARY AS THE BASIS FOR THE CONFORMANCE LETTER.
D. THE STRCTURE IS DESIGNED TO FUNCTION AS A UNIT UPON COMPLETION OF CONSTRUCTION OF THE ENTIRE PROJECT AND THEN ONLY TO SUPPORT THE DESIGN LOADS INDICATED. CONTRACTOR IS RESPONSIBLE FOR DETERMINING LOADINGS OCCURRING DURING CONSTRUCITON, FOR COORDINATING WITH TRADE CONTRACTORS, AND FOR DETERMINING AND NOT EXCEEDING THE CAPACITY OF THE STRUCTURE AT ANY TIME PRIOR TO COMPLETION OF THE ENTIRE PROJECT.

TRADE COORDINATION:
A. THE STRUCTURAL DRAWINGS ARE INTENDED TO BE USED IN CONJUNCTION WITH THE ARCHITECTURAL, ELECTRICAL, MECHANICAL, PLUMBING, SITE DRAWINGS, AND REFERENCED STANDARDS. CONFLICTS IN DIMENSION AND INTERFERENCE SHALL BE DIRECTED TO THE ARCHITECT PRIOR TO CONSTRUCTION.

SPECIFICATIONS:
A. THE STRUCTURAL DRAWINGS SHALL WORK IN CONJUNCTION WITH THE SPECIFICATIONS. IF CONFLICT ARISES FROM THE RECOMMENDATIONS OF THESE DRAWINGS AND THE SPECIFICATIONS, THE ARCHITECT SHALL BE NOTIFIED OF THE DISCREPANCY PRIOR TO CONSTRUCTION.

OPENINGS:
A. OPENINGS, SLEEVES, POCKETS, ETC. SHALL NOT BE PLACED IN BEAMS, JOISTS, COLUMNS, SLABS, OR OTHER STRUCTURAL MEMBERS. UNLESS SPECIFICALLY DETAILED ON THE STRUCTURAL DRAWINGS. NOTIFY THE ARCHITECT WHEN DRAWINGS BY OTHERS SHOW OPENINGS, SLEEVES, POCKETS, OR OTHER PENETRATIONS IN STRUCTURAL MEMBERS NOT SHOWN ON THE STRUCTURAL DRAWINGS.
B. WHERE OPENINGS ARE INDICATED, VERIFY SIZE AND LOCATION WITH ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS.
C. C. NOT ALL OPENINGS AND OTHER PROJECT COMPONENTS THAT ARE REQUIRED HAVE BEEN SHOWN ON THE STRUCTURAL DRAWINGS.
D. THE CONTRACTOR IS RESPONSIBLE FOR REVIEWING THE MECHANICAL, ELECTRICAL, PLUMBING, CIVIL AND ARCHITECTURAL DRAWINGS TO DETERMINE WHERE OPENINGS ARE REQUIRED IN STRUCTURAL ELEMENTS, AND FOR CONFIRMING WITH THE ENGINEER OF RECORD THAT ALL SUCH OPENINGS ARE ACCEPTABLE WHERE NOT SHOWN ON THE STRUCTURAL DRAWINGS.
E. THE CONTRACTOR SHALL SUBMIT THE SHOP DRAWINGS, DETAILING ALL THE OPENINGS, INCLUDING ADDED REINF AS SHOWN ON THE SLAB AND BEAM OPENING DETAILS AND SCHEDULES, FOR REVIEW.
F. OPENINGS PLACED IN CONCRETE SLABS, DECKS, OR WALLS NOT SPECIFICALLY DETAILED ON DRAWINGS: NOTIFY THE ENGINEER OF RECORD WHEN DRAWINGS BY OTHERS SHOW OPENINGS, POCKETS, ETC. LARGER THAN 6" THAT ARE NOT SHOWN ON THE STRUCTURAL DRAWINGS BUT THAT ARE LOCATED IN STRUCTURAL MEMBERS.
G. PERMITTED OPENINGS IN NEW CONCRETE SHALL BE FORMED. PERMITTED OPENINGS IN NEW STEEL SHALL BE SHOP FABRICATED. TRADE CONTRACTORS SHALL NOT RELY ON CORE DRILLING OR CUTTING OF OPENINGS IN NEW CONSTRUCTION.
H. FOR NEW OPENINGS IN EXISTING CONCRETE CONSTRUCTION, LOCATE EXISTING EMBEDMENTS AND SECURE APPROVAL OF ENGINEER OF RECORD PRIOR TO CUTTING.
I. DO NOT CUT BEYOND EDGES OR CORNERS OF NEW OPENINGS IN EXISTING CONSTRUCTION. DO NOT CUT DEEPER THAN REQUIRED. WHERE SAW CUTTING IS USED, DO NOT OVER RUN CORNERS: CORE DRILL CORNERS.
J. ELECTRICAL CONDUIT IN ANY ELEVATED CONCRETE SLAB SHALL BE PLACED AT MID HEIGHT OF THE SLAB AND SHALL BE SPREAD OUT SO THAT THERE IS A MIN OF 2" BETWEEN EACH CONDUIT. SUBMIT CONDUIT LAYOUTS FOR ENGINEER OF RECORD REVIEW PRIOR TO PLACING REINF.

EXISTING CONDITIONS:
A. THE EXISTING CONDITIONS DEPICTED ON THESE DRAWINGS ARE BASED ON THE BEST AVAILABLE INFORMATION AND SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
B. VERIFY DIMENSIONS OF ALL EXISTING CONDITIONS AND REPORT DISCREPANCIES WITH THE CONTRACT DOCUMENTS TO THE ARCHITECT PRIOR TO CONSTRUCTION.

CONSTRUCTED STRUCTURE:
A. THE CONTRACTOR SHALL CONSTRUCT THE STRUCTURE IN ACCORDANCE WITH THE STRUCTURAL CONTRACT DOCUMENTS. IF THE CONTRACTOR DEVIATES FROM THESE DOCUMENTS THE CONTRACTOR IS RESPONSIBLE FOR SUBMITTING A PROPOSED REPAIR TO THE ENGINEER OF RECORD FOR REVIEW PRIOR TO MAKING THAT REPAIR, AND THEN COMPLETING THE APPROVED REPAIR TO THE SATISFACTION OF THE ENGINEER OF RECORD.

FOUNDATIONS

GEOTECHNICAL INVESTIGATION:
A. THE GEOTECH REPORT AS INDICATED IS AVAILABLE IN THE OFFICE OF THE ARCHITECT. IT IS THE CONTRACTOR'S RESPONSIBILITY TO BECOME FAMILIAR WITH ALL OF THE REPORT REQUIREMENTS. THE FOLLOWING DESIGN PARAMETERS INDICATED HAVE BEEN BASED ON THIS REPORT AS ACCEPTED BY THE OWNER. IF CONDITIONS DIFFER FROM THOSE PRESENTED HEREIN, THE ARCHITECT SHALL BE NOTIFIED BEFORE CONTINUATION OF THE WORK.

PERIMETER DRAIN AND/OR UNDERSLAB DRAIN:
A. REFER TO GEOTECH REPORT FOR DETAILS OF ANY PERFORATED, PERIMETER DRAINS AROUND ALL FOUNDATION WALLS AND FOR AN UNDERSLAB DRAIN

SPREAD FOOTINGS:
A. SUBGRADE SHALL BE INSPECTED AND APPROVED BY A GEOTECH ENGINEER REGISTERED IN THE JURISDICTION HAVING AUTHORITY OVER THE PROJECT SITE TO VERIFY BEARING CAPACITIES IMMEDIATELY PRIOR TO THE FOOTINGS BEING CONSTRUCTED.
B. BOTTOMS OF FOOTINGS SHALL BE AT OR BELOW FROST DEPTH, UNO.
C. FOOTINGS SHALL BE CONSTRUCTED ON UNDISTURBED NATURAL SOIL, OR ON COMPACTED STRUCTURAL FILL MATERIAL PER THE RECOMMENDATIONS OF THE GEOTECH ENGINEER.

FOUNDATION WALLS:
A. BACKFILL FROM REAR FACE OF WALL FOR 2 FEET WITH FREE-DRAINING GRANULAR BACKFILL MATERIAL OR AS PER DETAIL APPROVED BY THE GEOTECH ENGINEER.
B. FOUNDATION WALLS SHALL NOT BE BACKFILLED UNTIL THEY HAVE REACHED THEIR FULL DESIGN STRENGTH AND FIRST FLOOR AND SLAB ON GRADE AT BOTTOM OF WALL CONSTRUCTION IS COMPLETED, OR UNLESS THEY ARE ADEQUATELY BRACED IN ACCORDANCE WITH CONTRACTOR DESIGNED BRACING. WHERE BACKFILL IS REQUIRED ON BOTH SIDES OF WALLS BACKFILL BOTH SIDES SIMULTANEOUSLY.
C. FOR PERIMETER DRAIN DETAILS AND REQUIREMENTS REFER TO GEOTECH REPORT.

SITE RETAINING WALLS:
A. BACKFILL FROM REAR FACE OF WALL FOR 2 FEET WITH FREE-DRAINING GRANULAR BACKFILL MATERIAL OR AS PER DETAIL APPROVED BY THE GEOTECH ENGINEER.

EXTERIOR GRADE:
A. SLOPE PERIMETER GRADE AWAY FROM BUILDINGS AS RECOMMENDED BY THE GEOTECH ENGINEER OR AS INDICATED IN THE GEOTECH REPORT.

CONCRETE:

GENERAL REQUIREMENTS:
A. CONCRETE HAS BEEN DESIGNED PER STANDARDS INDICATED IN STANDARDS SCHEDULE.
B. ALL VERTICAL SURFACES OF CONCRETE SHALL BE FORMED, UNO.
C. CONTRACTOR SHALL NOTIFY STRUCTURAL ENGINEER OF RECORD 48 HRS. PRIOR TO ANY CONCRETE PLACEMENT.
D. CONCRETE PLACED AGAINST HARDENED CONCRETE SHALL BE CLEAN, FREE OF LAITANCE, & INTENTIONALLY ROUGHENED TO A FULL AMPLITUDE OF APPROXIMATELY 1/4". APPLY BONDING AGENT AT THE JOINT SURFACE PER ASTM C1059 TYPE II.
E. HORIZONTAL CONSTRUCTION JOINTS SHALL NOT BE PERMITTED IN THE BEAMS UNLESS SHOWN ON THE STRUCTURAL DRAWINGS.
F. ALL CONSTRUCTION AND CONTROL JOINTS FOR COLUMNS AND BEAMS THAT ARE EXPOSED TO VIEW ARE TO BE LOCATED TO COINCIDE WITH THE ARCHITECTURAL RUSTICATION JOINTS AS SHOWN ON THE BUILDING ELEVATION SHEETS OR AS REVIEWED BY THE ENGINEER OF RECORD

CONCRETE REINF:
A. DETAIL ALL REINF IN ACCORDANCE WITH THE STANDARDS INDICATED IN THE SCHEDULE
B. PROVIDE ALL ACCESSORIES NECESSARY TO SUPPPORT REINF AT POSITIONS SHOWN ON THE PLANS
C. ALL REINF SHALL BE OF NEW BILLET STEEL CONFORMING TO STANDARDS REFERENCED IN SCHEDULE. GRADE 60 OR HIGHER REINF SHALL NOT BE FIELD-BENT.
D. REINF SPLICES SHALL CONSIST OF TIED LAPS. LENGTHS INDICATED ON THE DEVELOPMENT LENGTH SCHEDULE.
E. ALL REINF, ANCHOR RODS AND OTHER CONCRETE INSERTS SHALL BE WELL SECURED IN POSITION PRIOR TO PLACING CONCRETE.
F. WELDING OF REINF SHALL BE ALLOWED ONLY AS INDICATED ON DRAWINGS AND SHALL BE LOW ALLOY STEEL CONFORMING TO STANDARD INDICATED IN MATERIAL SCHEDULE. ALL WELDING OF REINF SHALL BE IN COMPLIANCE WITH THE REFERENCED WELDING STANDARD.
G. REINF IN ADDITION TO THAT SHOWN IN THE SLAB AND BEAM OPENING DETAILS MAY BE REQUIRED BY OTHER TRADES AND WILL BE REVIEWED ON THE SHOP DRAWINGS.

CONCRETE SLABS ON GRADE:
A. PROVIDE 6X6 W2.1XW2.1 WWF IN ALL SLABS ON GRADE (UNO).
B. PROVIDE UNDER SLAB PREPARATION OF SUBGRADE OR IMPORTED FILL AS DIRECTED BY GEOTECHNICAL ENGINEER OR INDICATED IN THE GEOTECHNICAL REPORT.
C. REFER TO THE GEOTECH REPORT FOR DETAILS OF ANY PERFORATED, PERIMETER DRAINS OR UNDERSLAB DRAINS.
D. PROVIDE UNDER SLAB PREPARATION OF SUBGRADE OR IMPORTED FILL AS DIRECTED IN GEOTECH REPORT
E. PROVIDE VAPOR BARRIER BENEATH THE CONCRETE SLAB IF REQUIRED PER ARCH DETAILS.
F. COLUMNS, ANCHOR RODS, BASE PLATES, ETC. HAVE BEEN DESIGNED FOR THE FINAL COMPLETED CONDITION AND HAVE NOT BEEN INVESTIGATED FOR POTENTIAL LOADINGS ENCOUNTERED DURING STEEL ERECTION AND CONSTRUCTION. ANY INVESTIGATION OF THE COLUMNS, ANCHOR RODS, BASE PLATES, ETC. FOR ADEQUACY DURING THE STEEL ERECTION AND CONSTRUCTION PROCESS IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
G. PLACE CONTROL JOINTS AT COLUMN LINES AND INTERMEDIATE LINES IN EACH DIRECTION. ADDITIONAL JOINTS SHALL BE PROVIDED AS REQUIRED SUCH THAT THE AREA OF EACH PANEL DOES NOT EXCEED 225 SQUARE FEET. CONTROL JOINT SHALL NOT BE SPACED FURTHER THAN 15 FEET OR WITH A LENGTH TO WIDTH RATIO GREATER THAN 1:1.5. LOCATE CONSTRUCTION JOINTS AT CONTROL JOINTS. HORIZONTAL CONSTRUCTION JOINTS ARE NOT PERMITTED EXCEPT THOSE SHOWN ON THE STRUCTURAL DRAWINGS. THE ENGINEER OF RECORD SHALL APPROVE ALL DEVIATIONS OR ADDITIONAL JOINTS IN WRITING.
H. WHERE THE SLAB IS TO RECEIVE SENSITIVE ARCH FLOOR FINISHES, SUCH AS CERAMIC TILE, ALL JOINTS IN SLAB CONSTRUCTION SHALL BE PLACED TO ALIGN WITH THE JOINTS IN THE FINISHED MATERIAL.
I. THE CONTRACTOR IS CAUTIONED AGAINST LOADING THE SLAB ON GRADE WITH CRANE OR CONSTRUCITON EQUIPMENT LOADS. THE SLAB HAS NOT BEEN DESIGNED FOR CRANE OR CONSTRUCTION EQUIPMENT LOADS AND WILL REQUIRE AN INCREASE IN SLAB THICKNESS AND/OR ADDITIONAL FOUNDATIONS AND/OR REINF. THE CONTRACTOR IS REQUIRED TO SUBMIT CALCULATIONS SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE JURISDICTION HAVING AUTHORITY OVER THE PROJECT SITE VERIFYING THE ADEQUACY OF THE SLAB FOR ANY USES THAT EXCEED THE STATED DESIGN LOAD VALUES.
J. SEE ARCH DRAWINGS FOR EXACT LOCATIONS OF DEPRESSED SLAB AREAS AND DRAINS. SLOPE SLAB TO DRAINS WHERE SHOWN.

WOOD:

SAWN LUMBER
A. ALL WOOD FRAMING SHALL CONFORM TO THE STANDARDS INCLUDED IN THE SCHEDULE.
B. ALL LUMBER SHALL BE NAILED IN ACCORDANCE WITH THE IBC. PRE-DRILL HOLES FOR NAILS AS REQUIRED TO PREVENT SPLITTING.
C. ALL PLYWOOD AND GYPSUM SHEATHING SHALL BE SECURELY NAILED TO STUDS TO PROVIDE BRACING PARALLEL TO THE WALL. NOTCHES OR HOLES THROUGH STUDS SHALL NOT REDUCE THE CROSS-SECTIONAL AREA OF THE POST BY MORE THAN 25%. AT NOTCHES USE SIMPSON HSS STUD SHOES.
D. TRIMMER (BEARING) STUDS INDICATED ON PLANS AT BEAMS AND HEADERS SHALL BE THE NUMBER OF STUDS THE BEAM OR HEADER BEARS ON. KING STUDS ADJACENT TO THE BEAM/HEADER ARE IN ADDITION TO THE NUMBER OF TRIMMER STUDS INDICATED.
E. ALL SILLS AND PLATES RESTING ON CONCRETE OR MASONRY SHALL BE PRESSURE TREATED. ANCHOR RODS SHALL BE PLACED 8" FROM THE END OF A BOARD OR FROM A HOLE OR NOTCH GREATER THAN 1/3 THE WIDTH OF THE PLATE. ANCHOR RODS SHALL BE SPACED AS NOTED. ANCHOR RODS SHALL EXTEND MIN 2" ABOVE SILL
F. ALL ANCHOR ROD HEADS AND NUTS BEARING ON WOOD SHALL HAVE WASHERS.
G. HOLES IN SILL PLATES FOR ANCHOR RODS SHALL BE SNUG TO PREVENT WALL MOVEMENT. PROVIDE ADDITIONAL NAILING AT JOIST SILL PLATE CONNECTION TO PREVENT SLIPPAGE.
H. ALL EXTERIOR CORNERS SHALL HAVE A MMINIMUM OF 3 STUDS.

ENGINEERED WOOD I-JOISTS:
A. REFER TO STRUCTURAL SUBMITTALS AND SHOP DRAWING NOTES FOR ENGINEERED WOOD I-JOIST REQUIREMENTS. ALL REQUIRED STRUCTURAL SUBMITTALS AND SHOP DRAWINGS SHALL BE SUBMITTED FOR APPROVAL PRIOR TO CONSTRUCTION.
B. ALL JOIST ERECTION BRACING, BLOCKING AND OTHER ACCESSORIES, SHALL CONFORM TO THE SPECIFICATIONS OF THE APPROVED SUPPLIER, SHALL BE FURNISHED BY THE MANUFACTURER AND SHALL BE INSTALLED IN STRICT CONFORMANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS INDICATED ON THE DRAWINGS.
C. HOLES, CUTS OR NOTCHES IN ENGINEERED WOOD I-JOISTS SHALL COMPLY WITH THE MANUFACTURER'S ALLOWABLE SPECIFICATIONS FOR SIZE AND LOCATION.

ENGINEERED WOOD LAMINATED VENEER LUMBER (LVL) BEAMS:
A. LVL BEAMS SHALL CONFORM TO THE SPECIFICATIONS OF THE APPROVED SUPPLIER AND BE PER MATERIAL SCHEDULE.
B. HOLES, CUTS OR NOTCHES IN ENGINEERED WOOD MEMBERS SHALL COMPLY WITH THE MANUFACTURER'S ALLOWABLE SPECIFICATIONS FOR SIZE AND LOCATION.

ENGINEERED WOOD LAMINATED STRAND LUMBER (LSL) STUDS, BEAMS, RIMBOARDS:
A. LSL MEMBERS SHALL CONFORM TO THE SPECIFICATIONS OF THE APPROVED SUPPLIER AND BE PER MATERIALS SCHEDULE.
B. HOLES, CUTS OR NOTCHES IN ENGINEERED WOOD MEMBERS SHALL COMPLY WITH THE MANUFACTURER'S ALLOWABLE SPECIFICATIONS FOR SIZE AND LOCATION.

SHEATHING:
A. THE SHEATHING AND NAILING REQUIREMENTS INDICATED ARE MINIMUMS AND MAY BE INCREASED FOR NONSTRUCTURAL REASONS.
B. FLOOR SHEATHING TO BE GLUED AND NAILED TO JOISTS. JOISTS TO BE GLUED AND NAILED AT HANGERS.
C. ALL ROOF AND FLOOR DIAPHRAGMS MAY BE CONSTRUCTED AS UNBLOCKED (UNO).
D. ALL WALL DIAPHRAGMS SHALL BE CONSTRUCTED AS BLOCKED UNO.
E. SHEATHING SHALL BE AS INDICATED IN THE MATERIAL SCHEDULE .
F. SHEATHING SHALL BE PLACED WITH THE 8'-0" DIMENSION PERPENDICULAR TO TRUSSES, RAFTERS AND FLOOR JOISTS AND PARALLEL TO STUDS FOR WALL FRAMING, STAGGER JOINTS IN ALL SHEATHING. PANEL END JOINTS SHALL OCCUR CENTERED ON A TRUSS, JOIST OR STUD. ALL SHEATHING ENDS & EDGES SHALL HAVE A MIN. 1/16" AND MAX. 1/8" GAP.

METAL CONNECTORS:
A. HANGERS FOR JOISTS AND BEAMS SHALL BE AS NOTED ON PLANS. HANGERS SHALL CONFORM TO THE REQUIREMENTS OF THE APPROVED SUPPLIER.
B. INSTALL ATTACHMENT TO ACHIEVE MAXIMUM CONNECTION CAPACITY.

PRE-ENGINEERED WOOD TRUSSES:
A. ROOF TRUSSES SHALL BE DESIGNED FOR THE LOADS INDICATED IN THESE DOCUMENTS. INCLUDE ADDITIONAL BOTTOM CHORD DEAD LOAD OF 5 PSF TO ALLOW FOR SUSPENDING INTERIOR PARTITIONS FROM TRUSSES. INCLUDE MECHANICAL EQUIP. LOADS AS NOTED ON MECHANICAL PLANS. CONTRACTOR TO CONFIRM THESE LOADS TO TRUSS FABRICATOR PRIOR TO TRUSS FABRICATION. LOAD COMBINATIONS SHALL BE ACCORDING TO THE BUILDING CODE REFERENCED IN THESE DOCUMENTS. INCLUDE DOUBLE SNOW LOAD ON EAVE OVERHANGS AND ROOF OVERHANGS.
B. TRUSSES SHALL BE DESIGNED FOR A ROOF DEFLECTION OF L/240 FOR DEAD LOAD PLUS FULL LIVE LOAD.
C. ROOF TRUSS TOP CHORD LUMBER SHALL HAVE A SPECIFIC GRAVITY GREATER THAN 0.49.
D. CALCULATIONS AND DRAWINGS INCLUDING BRACING MEMBERS AND TRUSS TO TRUSS HANGERS FOR ALL ROOF TRUSSES, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE JURSDICTION HAVING AUTHORITY OVER THE PROJECT SITE, SHALL BE SUBMITTED FOR APPROVAL A MINIMUM OF TWO WEEKS PRIOR TO FABRICATION.
E. TRUSSES SHALL BE BRACED FOR STRENGTH REQUIREMENTS FOR EACH TRUSS ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS, AND FOR OVERALL STABILITY AS SPECIFIED ON THE PLANS. TRUSS WEBS & BOTTOM CHORDS SHALL ALSO BE DIAGONALLY BRACED ACCORDING TO THE RECOMMENDATIONS OF THE STANDARD REFERENCED IN THE SCHEDULE TO PROVIDE A RIGID ROOF DIAPHRAGM.
F. SEE ARCHITECTURAL DRAWINGS FOR TRUSS PROFILES.
G. TRUSS WIDTH AT BEARING SHALL BE ADJUSTED SO AS NOT TO EXCEED A BEARING PRESSURE OF 400 PSI ON THE WOOD BEARING PLATE.

STRUCTURAL STEEL:

GENERAL REQUIREMENTS:
A. STRUCTURAL STEEL CONSTRUCTION SHALL BE FABRICATED AND INSTALLED IN ACCORDANCE WITH THE STANDARDS INDICATED IN THE SCHEDULE.
B. ALL BOLTED CONNECTIONS SHALL BE MADE USING 3/4" DIAMETER BOLTS, (UNO) INSTALLED SNUG TIGHT IN ACCORDANCE WITH THE STANDARD REFERENCED IN THE SCHEDULE. MINIMUM OF TWO BOLTS PER CONNECTION. ALL BOLT HOLES TO BE 1/16" LARGER IN DIAMETER THAN NOMINAL SIZE OF BOLT. ALL BASE PLATE BOLT HOLES TO BE 3/16" LARGER IN DIAMETER THAN NOMINAL SIZE OF ANCHOR ROD. THE TOLERANCES FOR PLACEMENT OF ANCHOR RODS REQUIRED BY THE AISC CODE OF STANDARD PRACTICE SHALL BE MET.
C. ALL STEEL SHALL BE SHOP PAINTED WITH A PRIMER. ALL WELDS AND BARE SPOTS SHALL RECEIVE TOUCHUP PAINT. FINISH COAT PAINT TO ARCHITECTURAL DETAILS AND SPECIFICATIONS.
D. ALL STRUCTURAL STEEL SURFACES ENCASED IN CONCRETE OR WITH SPRAYED ON FIREPROOFING, SHALL BE LEFT UNPAINTED. ALL STRUCTURAL STEEL SHALL BE FIREPROOFED AS REQUIRED BY ARCHITECTURAL DETAILS.
E. CONSTRUCTION DOCUMENTS DEPICT STRUCTURAL STEEL FRAMING WITH ROOF AND FLOOR SLAB/DECK IN FINAL, LATERALLY STABLE CONDITION. DURING ERECTION, APPROVED TEMPORARY BRACING SHALL BE INSTALLED AS REQUIRED TO PREVENT DISTORTION OR DAMAGE TO THE FRAMEWORK DUE TO THE ERECTION FORCES.
F. ALL STEEL PERMANENTLY EXPOSED TO EARTH, WITHIN EXTERIOR CAVITY WALLS, EXPOSED TO WEATHER, OR NOTED ON THE DRAWINGS SHALL BE GALVANIZED OR COATED IN ZINC RICH PAINT.
G. WHERE BEAMS ARE INDICATED TO BE COMPOSITE WITH CONCRETE FLOOR SLAB ON METAL DECK, PROVIDE INDICATED NUMBER OF 3/4"ø STUDS EQUALLY SPACED ALONG LENGTH OF BEAM (UNO) IF NECESSARY, TWO SHEAR STUDS MAY BE PLACED IN ONE DECK FLUTE. THE LENGTH OF THE STUDS SHALL BE PER PLAN NOTES. LISTED LENGTH ARE FOR STUDS AFTER WELDING.
H. PRIOR TO THE COMMENCEMENT OF WORK EACH DAY, A MINIMUM OF TWO TEST STUD WELDS SHALL BE MADE WITH EQUIPMENT, WHICH IS THE SAME AS AN ACTUAL WORK PIECE. THE TEST STUDS SHALL BE SUBJECTED TO A 90 DEGREE BEND TEST BY STRIKING THEM WITH A HEAVY HAMMER AFTER THE ABOVE TEST, THE WELD SECTION SHALL NOT EXHIBIT ANY REARING OUT OR CRACKING.

WELDING:
A. NO FAILED WELD SHALL BE PERMITTED TO REMAIN IN SERVICE. IT IS THE RESPONSIBILITY OF THE TESTING LABORATORY TO PROVIDE TIMELY NOTICE OF FAILED TESTS TO THE CONTRACTOR.
B. WELDING SHALL PROGRESS IN A MANNER WHICH BALANCES THE STRESSES IN THE MEMBERS IN ACCORDANCE WITH AWS

DELEGATED DESIGN SUBMITTALS

METAL STAIRS & RAILINGS	DESIGN OF METAL STAIRS & RAILINGS SHALL BE PROVIDED BY THE CONTRACTOR PRIOR TO FABRICATION. THE DESIGN PACKAGE SHALL BE SUBMITTED FOR REIVEW AND SHALL INCLUDE SHOP DRAWINGS AND CALCULATIONS STAMPED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE JURISDICTION HAVING AUTHORITY OVER THE PROJECT SITE. COORDINATE METAL STAIRS & RAILINGS WITH ARCHITECTURAL & LANDSCAPE PLANS.
ELEVATOR & SUPPORTS	DESIGN OF ELEVATOR & SUPPORTS SHALL BE PROVIDED BY THE MANUFACTURER PRIOR TO FABRICATION. THE SUBMITTAL PACKAGE SHALL BE SUBMITTED FOR REIVEW AND SHALL INCLUDE SHOP DRAWINGS AND CALCULATIONS/REACTIONS STAMPED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE JURISDICTION HAVING AUTHORITY OVER THE PROJECT SITE.

DEFERRED SUBMITTAL GENERAL NOTES

PHOTOVOLTAIC ROOF TOP SYSTEM:
A. WEIGHT OF THE SYSTEM (POUNDS PER SQUARE FOOT) INCLUDING MOUNTING HARDWARE.
B. PROVIDE DETAIL OF PV PANEL MOUNTING HARDWARE ATTACHMENT TO THE ROOF FRAMING MEMBERS.
C. PROVIDE MOUNTING HARDWARE MANUFACTURER SPECIFICATION.
D. PV SYSTEM PROVIDER SHALL SUBMIT INSTALLATION PLANS INCLUDING ENGINEERING CALCULATIONS AND DETAILS DEMONSTRATING ADEQUACY OF MOUNTING MEMBERS, INCLUDING WIND UPLIFT EFFECTS AND SEISMIC EFFECTS, PRIOR TO FABRICATION AND CONSTRUCTION.

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

NYL
Studio NYL
2960 Baseline Road, #314 303.558.3145
Boulder, Colorado 80303 www.studnyl.com
Boulder, Denver | Colorado Springs | Keystone | Minneapolis

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

0 1' THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21009

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

GENERAL NOTES

SG001

COPYRIGHT©

PLOT DATE: 3/22/2022 10:40:45 AM

CONCRETE MIX

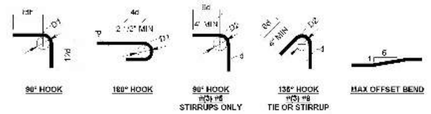
1. AGGREGATE SIZE SHALL COMPLY WITH ASTM C33 OR ASTM 330.
2. TOTAL AIR CONTENT LIMITS INCLUDE BOTH ENTRAINED AND ENTRAPPED AIR ± 1.5%. 'NP' IN COLUMN INDICATES ADDITION OF ENTRAINED AIR IS NOT PERMITTED.
3. FOR DRILLED PIERS CASED DURING CONSTRUCTION PROVIDE CONCRETE MIX WITH FLOWABILITY TO PREVENT ARCHING WHEN CASING IS PULLED.
4. FOR CONCRETE PLACED BY PUMPING PROVIDE CONCRETE MIX FLOWABILITY TO FACILITATE PUMPING.
5. SLUMP SHALL BE CONSISTENT WITH EACH MIX TYPE

INTENDED USE	28 DAY STRENGTH fc (KSI)	CONCRETE WEIGHT	MAX. W/C RATIO, INCLUDING FLY ASH	MAX AGGREGATE SIZE, NOTE #1	TOTAL AIR CONTENT (%), NOTE #2	CEMENT TYPE	EXPOSURE CATEGORY (UNO)
FOOTINGS	4	NWC	0.45	3/4"	5	I / II	F0, S0, W0, C1
GRADE BEAMS, TIE BEAMS, BASEMENT WALLS	4	NWC	0.45	3/4"	5	I / II	F0, S0, W0, C1
ALL CONCRETE EXPOSED TO WEATHER OR DEICERS: [eg: PARKING STRUCTURES, LOADING DOCKS, SITE WALLS]	4.5	NWC	0.40	3/4"	6	I / II	F3, S1, W1, C2
INTERIOR TOPPING SLABS, SLABS ON METAL DECK	4	LWC	0.50	3/4"	NP	I / II	F0, S0, W0, C0
INTERIOR SLAB ON GRADE	4	NWC	0.45	3/4"	NP	I / II	F0, S0, W0, C0
SLAB ON GRADE WITH MOISTURE SENSITIVE FLOORING	4	NWC	0.45	3/4"	NP	I / II	F0, S0, W1, C1

REINFORCING BEND, DEVELOPMENT LENGTH & SPLICE

- BASIC = BASIC DEVELOPMENT LENGTH (*ℓd*)
- HOOKED = HOOKED DEVELOPMENT LENGTH (*ℓdh*)
- CLASS "A" SPLICE = 1.0 *ℓd*
- CLASS "B" SPLICE = 1.3 *ℓd*
- REINF BARS IN SLABS AND WALLS SHALL HAVE A YIELD STRENGTH OF 60 KSI. A FULL MECHANICAL CONNECTION OR FULL WELDED SPLICE MAY BE SUBSTITUTED FOR LAP SPLICES. ALL SPLICES SHALL DEVELOP IN TENSION OR COMPRESSION AT LEAST125% OF THE SPECIFIED YIELD STRENGTH fy OF THE BAR. SUBMIT ANY SUBSTITUTION TO THE ENGINEER FOR APPROVAL.
- MULTIPLY *ℓd* BY 1.3 FOR LIGHTWEIGHT CONCRETE & "TOP BARS" *ℓd* BY 1.5 FOR EPOXY COATED REINF.

PRINCIPAL REINFORCING



- ALTERNATE LOCATION OF HOOKS IN COLUMN TIES BY 90° @ EACH LEVEL.
- ALL REINF FABRICATION PER LATEST EDITION OF "ACI DETAILING MANUAL.
- ALL BENDS SHALL BE MADE COLD.
- #14 & #18 BARS SHALL BE BEND TESTED & LAB APPROVED PRIOR TO BENDING.

BAR SIZE	D1	D2	f'c= 3,000 PSI		f'c= 4,000 PSI		f'c= 5,000 PSI		f'c= 6,000 PSI		f'c= 8,000 PSI	
			BASIC	HOOKED	BASIC	HOOKED	BASIC	HOOKED	BASIC	HOOKED	BASIC	HOOKED
#4	6d	4d	22"	11"	20"	10"	18"	9"	17"	8"	14"	7"
#5	6d	4d	28"	14"	24"	12"	22"	11"	21"	10"	18"	9"
#6	6d	6d	33"	17"	29"	15"	27"	13"	25"	12"	21"	10"
#7	6d	6d	48"	20"	42"	17"	38"	15"	34"	14"	30"	12"
#8	6d	6d	55"	22"	48"	19"	43"	17"	39"	16"	33"	14"
#9	8d	8d	62"	25"	54"	22"	48"	19"	44"	18"	38"	15"
#10	8d	8d	69"	28"	60"	24"	53"	22"	49"	20"	42"	17"
#11	8d	8d	76"	31"	66"	27"	59"	24"	54"	22"	47"	19"

SHEARWALL

- SHEATHING TO BE 15/32" OSB GRADE EXPOSURE 1.
- SILL PLATE ANCHOR RODS SHALL HAVE MINIMUM 8" EMBEDMENT INTO CONCRETE FOUNDATION WALL AND HAVE A 2" HOOK (J-BOLTS).
- ALL STRAPS, ANGLES, PLATES, AND HOLD-DOWNS SHALL BE INSTALLED PER THE MANUFACTURER'S SPECIFICATIONS.
- ALL ANCHOR RODS SHALL BE SECURED IN PLACE PRIOR TO POURING CONCRETE PER THE GENERAL NOTES.
- STAPLES ARE NOT AN ACCEPTABLE FASTENTER ALTERNATIVE AT SHEARWALLS NOTED.
- REQUIRED STUDS AT ENDS OF TWO DIFFERENT SHEARWALLS MAY BE TRIMMER STUDS, KING STUDS, OR CORNER STUDS.
- WHERE THE ENDS OF TWO DIFFERENT SHEARWALLS INTERSECT, THE MORE STRINGENT STRAP AND ANCHOR SHALL APPLY.
- STUDS/POSTS SHOWN AT FOUNDATION WALLS SHALL BE OF STUD GRADE UNLESS NOTED OTHERWISE.
- TREATED SILL PLATE AT FOUNDATION WALLS SHALL BE (1) 2x6 HF#2 UNLESS NOTED OTHERWISE.
- IF A STEEL COLUMN OCCURS AT THE END OF A SW, HOLD-DOWN PER SCHEDULE MAY BE OMITTED IF SHEATHING IS ATTACHED TO STEEL COLUMN/NAILER.

TYPE	SHEATHING	SHEATHING SPAN RATINGS	FASTENERS	SPACING	STUDS @ PANEL EDGES	STUDS @ EA END OF SW	CONNECTION @ RIM/BLOCKING TO TOP PLATE (@ BTM OF SW)	STRAP/ HOLD DOWN @ BTM OF WALL @ EA END OF SW (TO SW BLW)	CONNECTION @ SOLE PLATE TO RIM/BLOCKING (@ BTM OF SW)	HOLD-DOWN @ EA END OF SW (@CONC FND WALL)	ANCHOR RODS (@ CONC FND WALL)	SHOT PIN SPACING PER GGN WD-24
EXTERIOR WALLS NOT NOTED AS SW	15/32" OSB	32/16	8d NAIL (0.131Ø, MIN 1 5/8" PEN)	6" @ EDGES, 12" IN FIELD	(1) 2x6	(1) 2x6	10d TOE-NAIL @ 6" OC	N/A	16d FACE-NAIL @ 8" OC	N/A	5/8" @ 24" OC	
SW1	15/32" OSB	32/16	10d NAIL (0.148Ø, MIN 1 5/8" PEN)	6" @ EDGES, 12" IN FIELD	(1) 2x6 OR (1) 2x4	(2) 2x6 OR (3) 2x4	10d TOE-NAIL @ 6" OC	CMSTC16 (25" END LENGTH, 10d NAILS)	16d FACE-NAIL @ 8" OC	HDU2-SDS2.5 (5/8"Ø A.B. W/ MIN 12" EMBED TO FDN BLW)	5/8" @ 24" OC	6" OC
SW2	15/32" OSB	32/16	10d NAIL (0.148Ø, MIN 1 5/8" PEN)	4" @ EDGES, 12" IN FIELD	(1) 2x6 OR (1) 2x4	(3) 2x6 OR (4) 2x4 LVL	10d TOE-NAIL @ 4" OC	CMST14 (34" END LENGTH, 10d NAILS)	16d FACE-NAIL @ 6" OC	HDU5-SDS2.5 (5/8"ø AB W/ MIN 12" EMBED TO FND BLW)	5/8" @ 16" OC	4" OC
SW3	15/32" OSB	32/16	10d NAIL (0.148Ø, MIN 1 5/8" PEN)	3" @ EDGES, 12" IN FIELD	(2) 2x6 OR (2) 2x4	(3) 2x6 OR (4) 2x4 LVL	LTP4 @12" OC	CMST12 (44" END LENGTH, 10d NAILS)	LTP4 @12" OC	HDU8-SDS2.5 (7/8"ø AB W/ MIN 12" EMBED TO FND BLW)	5/8" @ 16" OC	3" OC
SW4	2 LAYERS 15/32" OSB (ONE EA SIDE OF WALL)	32/16	10d NAIL (0.148Ø, MIN 1 5/8" PEN)	4" @ EDGES, 12" IN FIELD	(2) 2x6	(4) 2x6	LTP4 @ 8" OC	(2) CMST14 (34" END LENGTH, 10d NAILS)	LTP4 @ 8" OC	HDU14-SDS2.5 (1"ø AB W/ MIN 16" EMBED TO FND BLW)	5/8" @ 8" OC	(2) @ 4" OC
SW5	2 LAYERS 15/32" OSB (ONE EA SIDE OF WALL)	32/16	10d NAIL (0.148Ø, MIN 1 5/8" PEN)	3" @ EDGES, 12" IN FIELD	(2) 2x6	(4) 2x6	LTP4 @ 6" OC	(2) CMST12 (44" END LENGTH, 10d NAILS)	LTP4 @ 6" OC	HDU14-SDS2.5 (1"ø AB W/ MIN 16" EMBED TO FND BLW)	5/8" @ 6" OC	(2) @ 3" OC

CONCRETE COVER

CASE	COVER
COLUMNS, GIRDERS & BEAMS	1 1/2"
CONCRETE PLACED AGAINST EARTH	3"
CONCRETE PLACED IN FORMS, EXPOSED TO WEATHER OR EARTH	2"
CONCRETE PLACED IN VOID FORMS WITH MASONITE OR PLYWOOD COVERING JOISTS	2"
SLAB OR WALLS NOT EXPOSED TO EARTH OR WEATHER	1 1/2"
	1"

ABBREVIATIONS

ABRV	DESCRIPTION
(E)	EXISTING
AB	ANCHOR BOLT
ADJ	ADJUSTABLE
ALT	ALTERNATE
ARCH	ARCHITECT
BF	BRACED FRAME
BLKG	BLOCKING
BLW	BELOW
BM	BEAM
BO	BOTTOM OF
BP	BASEPLATE
BPL	BENT PLATE
BRDG	BRIDGING
BRG	BEARING
BS	BOTH SIDES
BTM	BOTTOM
BTWN	BETWEEN
CANT	CANTILEVER
CENT	CENTER(ED)
CFMF	COLD-FORMED METAL FRAMING
CIP	CAST IN PLACE
CJ	CONTROL JOINT
CJP	COMPLETE JOINT PENETRATION
CL	CENTERLINE
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
CONN	CONNECTION
CONT	CONTINUOUS
COORD	COORDINATE
DET	DETAIL
DF	DOUGLAS FIR
DIAG	DIAGONAL
DIM	DIMENSION
DL	DEAD LOAD
DP	DRILLED PIER
DWL	DOWEL
EA	EACH
EF	EACH FACE
EFP	EQUIVALENT FLUID PRESSURE
ELEV	ELEVATION
ENGR	ENGINEER
EQ	EQUAL(LY)

ABBREVIATIONS

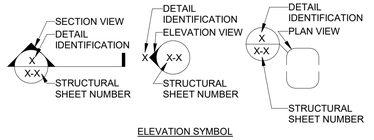
ABRV	DESCRIPTION
EW	EACH WAY
EXP	EXPANSION
FLG	FLANGE
FS	FAR SIDE
FTG	FOOTING
GA	GAGE
GALV	GALVANIZED
GB	GRADE BEAM
GL	GRID LINE
GSN	GENERAL STRUCTURAL NOTES
HAS	HEADED ANCHOR STUD
HF	HEM FIR
HGR	HANGER
HORIZ	HORIZONTAL
HSS	HOLLOW STRUCTURAL STEEL
IF	INSIDE FACE
ISO	ISOLATION
JST	JOIST
JT	JOINT
LAW	LENGTH AFTER WELDING
LL	LIVE LOAD
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LONG	LONGITUDINAL
LWC	LIGHT WEIGHT CONCRETE
MAX	MAXIMUM
MCJ	MASONRY CONSTRUCTION JOINT
MECH	MECHANICAL
MEP	MECHANICAL, ELECTRICAL, PLUMBING DRAWINGS
MEZZ	MEZZANINE
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
NA	NOT APPLICABLE
NOM	NOMINAL
NS	NEAR SIDE
NTS	NOT TO SCALE
NWC	NORMAL WEIGHT CONCRETE
O/F	OUTSIDE FACE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OPP	OPPOSITE
PERIM	PERIMETER

ABBREVIATIONS

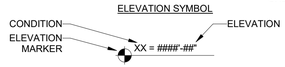
ABRV	DESCRIPTION
PERP	PERPENDICULAR
PJP	PARTIAL JOINT PENETRATION
PL	PLATE
PLY	SHEATHING/ PLYWOOD
PRELIM	PRELIMINARY
R	RADIUS
REINF	REINFORCEMENT
REQD	REQUIRED
RO	ROUGH OPENING
SCHED	SCHEDULE
SCJ	SAW CUT JOINT
SCL	STRUCTURAL COMPOSITE LUMBER
SECT	SECTION
SIM	SIMILAR
SL	SNOW LOAD
SOG	SLAB ON GRADE
SOMD	SLAB ON METAL DECK
SPEC	SPECIFICATIONS
STAG	STAGGERED
STD	STANDARD
STL	STEEL
STRUCT	STRUCTURAL
SW	SHEARWALL
T&B	TOP & BOTTOM
T&G	TONGUE & GROOVE
TBD	TO BE DETERMINED
TDP	TOP OF DRILLED PIER
TEMP	TEMPORARY
THK	THICKNESS
THRU	THROUGH
TO	TOP OF
TRANS	TRANSVERSE
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
VIF	VERIFY IN FIELD
W/	WITH
W/IN	WITHIN
W/O	WITHOUT
WL	WIND LOAD
WP	WORKING POINT
WWF	WELDED WIRE FABRIC
ℓd	DEVELOPMENT LENGTH
ℓdh	HOOKED DEVELOPMENT LENGTH

STANDARD SYMBOLS

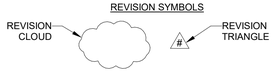
SECTION/ELEVATION/DETAIL VIEW SYMBOLS



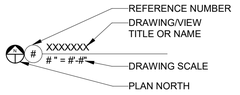
ELEVATION SYMBOL



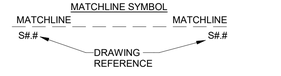
REVISION SYMBOLS



DRAWING VIEW SYMBOL

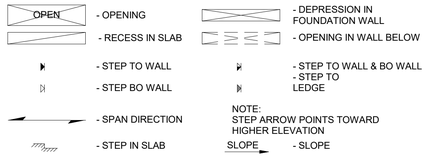


MATCHLINE SYMBOL



GRID-LINE SYMBOL

MISCELLANEOUS SYMBOLS



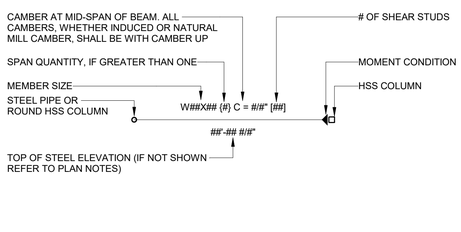
STANDARD HATCH PATTERNS

MATERIAL	PLAN	FACE	CUT
STEEL	NO HATCH	NO HATCH	
BEARING WALL	NO HATCH	NO HATCH	NO HATCH
SHEARWALL		NO HATCH	
CMU WALL			
WOOD SHEATHING	NO HATCH	NO HATCH	
GROUT/SAND	NO HATCH		
CONCRETE			
VOID FORM	NO HATCH		
GRAVEL	NO HATCH	N/A	
EARTH	NO HATCH	N/A	
POLYMER/THERMAL BREAK	NO HATCH	NO HATCH	
STRUCTURAL ALUMINUM	NO HATCH	NO HATCH	
STRUCTURAL GLASS	NO HATCH	NO HATCH	

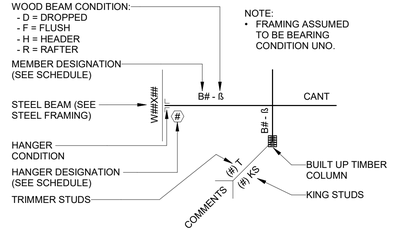
NOTES:
- ALL MATERIALS LISTED ARE NOT NECESSARALLY IN THE PROJECT. CONFIRM ALL MATERIALS WITH SECTIONS AND PLANS.
- *FLOORS/SLABS IN PLAN MAY VARY DUE TO CHANGES IN GEOMETRY OR ELEVATION.

STANDARD FRAMING PLAN DESIGNATIONS

STEEL FRAMING



TIMBER FRAMING



COPYRIGHT©

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

Studio NYL
2995 Baseline Road, #314 303.558.3145
Boulder, Colorado 80303 www.studnyl.com
Boulder, Denver | Colorado Springs | Reston | Minneapolis

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21009

Sheet Issue & Revision Log

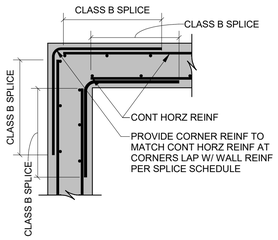
No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

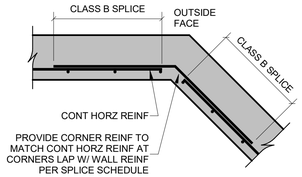
ABBREVIATIONS, SYMBOLS, LEGENDS & SCHEDULES

SG002

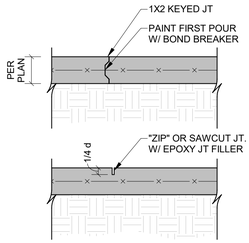
PLOT DATE: 3/22/2022 10:40:47 AM



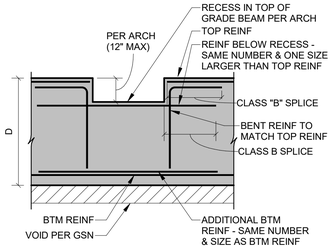
CORNER REINF IN CONCRETE WALL (DBL)
NTS **CT-01**



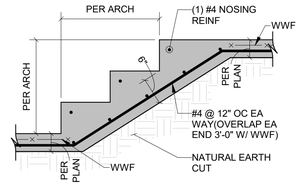
CORNER REINF IN CONCRETE WALL (SINGLE)
NTS **CT-06**



- PROVIDE CONTROL JT TO DIVIDE SLAB INTO GRID OF NO MORE THAN 225 SQ FT OR AS INDICATED ON PLAN WITH JT SPACED NO MORE THAN 15 FT OC (UNO) & NO SIDE MORE THAN 1 1/2 TIMES GREATER THAN ANY OTHER SIDE



RECESS IN TOP OF GRADE BEAM
NTS **CT-17**

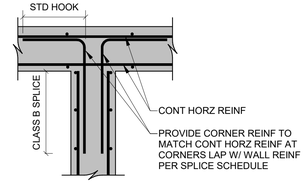


- TREAD/RISER DIMENSIONS & STAIR PROFILE PER ARCH

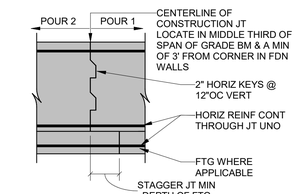
SOG CONC STAIR/LANDING
NTS **CT-26**

EMBED PLATE ON TOP OF WALL SCHEDULE

CONNECTING MEMBER	EMBED PLATE DIMENSIONS			HAS		
	THICKNESS	WIDTH	LENGTH	QTY	Ø	LAW
BASEPLATE @ WALL	3/4"	8"	16"	4	3/4"	6"
BASEPLATE @ WALL (OFFSET)	3/4"	8"	13"	4	3/4"	6"

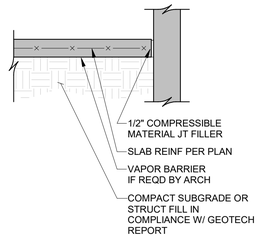


CORNER REINF IN CONCRETE WALL (DBL)
NTS **CT-02**

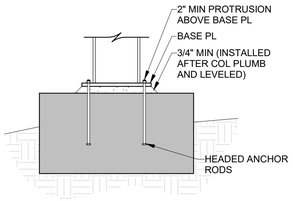


- SUBMIT ALL PROPOSED CONSTRUCTION JT LOCATIONS TO STRUCT ENG FOR REVIEW & APPROVAL TWO WEEKS PRIOR TO CONC POUR

FOUNDATION WALL CONSTRUCTION JOINT
NTS **CT-07**

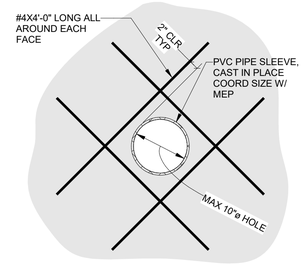


SOG CONSTRUCTION, CONTROL, & ISO JOINTS
NTS **CT-11**

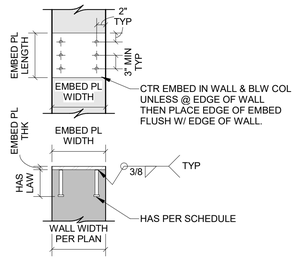


- REQD EMBEDMENT DEPTH PER BASE PL DETAILS
- FOUNDATION SIZE & REINF PER PLANS

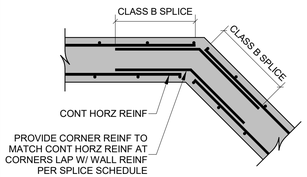
STEEL BASEPLATE ANCHORS
NTS **CT-20**



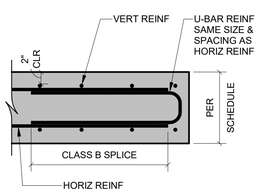
CONC PENETRATION REINF
NTS **CT-27**



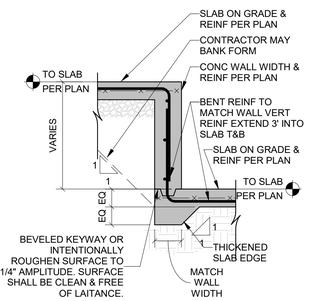
EMBED @ TO WALL - RECTANGULAR
NTS **CT-33**



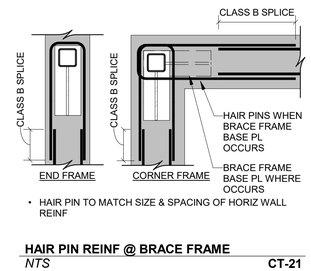
CORNER REINF IN CONCRETE WALL (DBL)
NTS **CT-03**



FOUNDATION WALL
NTS **CT-08**

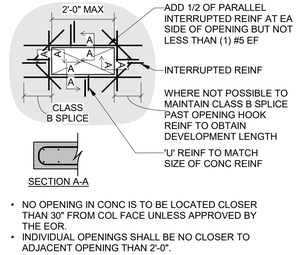


SLAB ON GRADE CURB
NTS **CT-13**



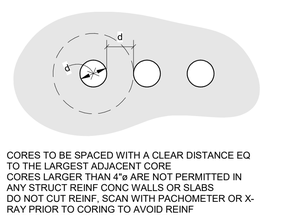
- HAIR PIN TO MATCH SIZE & SPACING OF HORIZ WALL REINF

HAIR PIN REINF @ BRACE FRAME
NTS **CT-21**



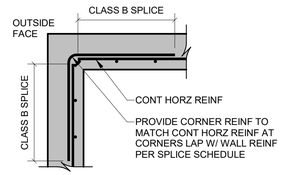
- NO OPENING IN CONC IS TO BE LOCATED CLOSER THAN 30" FROM COL FACE UNLESS APPROVED BY THE EOR.
- INDIVIDUAL OPENINGS SHALL BE NO CLOSER TO ADJACENT OPENING THAN 2'-0".

CONCRETE OPENING REINF WALLS/SLABS
NTS **CT-28**

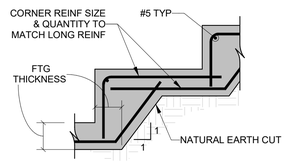


- CORES TO BE SPACED WITH A CLEAR DISTANCE EQ TO THE LARGEST ADJACENT CORE
- CORES LARGER THAN 4"ø ARE NOT PERMITTED IN ANY STRUCT REINF CONC WALLS OR SLABS
- DO NOT CUT REINF. SCAN WITH PACHOMETER OR X-RAY PRIOR TO CORING TO AVOID REINF
- COORD CORE LOCATIONS W/ MECH

PENETRATIONS IN EXISTING CONCRETE WALL/SLAB
NTS **CT-36**

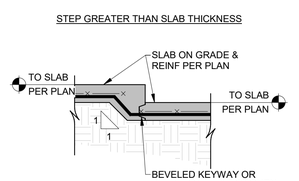


CORNER REINF IN CONCRETE WALL (SINGLE)
NTS **CT-04**



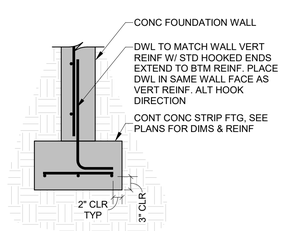
- PROVIDE 3" COVER WHERE CAST AGAINST EARTH
- 2" COVER WHERE FORMED
- MIN STEP RUN = 2X STEP RISE
- MAX STEP RISE = 24"

STEP FOOTING
NTS **CT-09**



- STEP LESS THAN OR EQUAL TO SLAB THICKNESS

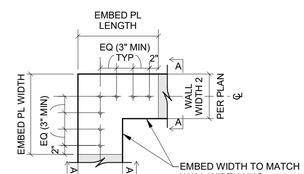
SOG STEP
NTS **CT-12**



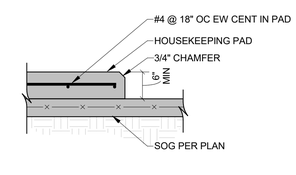
STRIP FOOTING
NTS **CT-22**

L SHAPE EMBED PLATE ON TOP OF WALL SCHEDULE

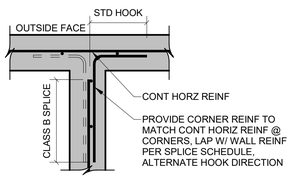
CONNECTING MEMBER	EMBED PLATE DIMENSIONS			HAS		
	THICKNESS	WIDTH	LENGTH	QTY	Ø	LAW
BASEPLATE @ CORNER	3/4"	12"	12"	5	3/4"	6"
BASEPLATE @ CORNER W/ GUSSET	3/4"	24"	24"	5	3/4"	6"



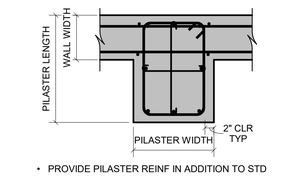
EMBED @ TO WALL - L SHAPE
NTS **CT-32**



MECHANICAL HOUSEKEEPING PAD
NTS **CT-38**

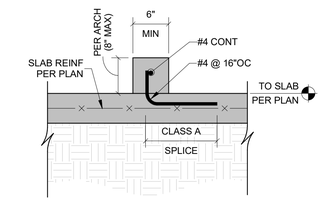


CORNER REINF IN CONCRETE WALL (SINGLE)
NTS **CT-05**

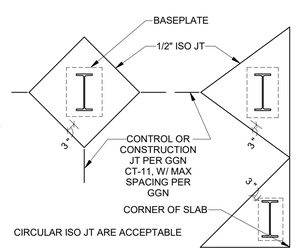


- PROVIDE PILASTER REINF IN ADDITION TO STD WALL REINF
- PROVIDE (3) #3 OR (2) #4 CLOSED TIES W/I TOP 5" OF PILASTER
- SIZE & REINF PER SCHEDULE

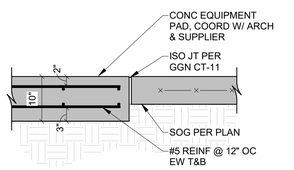
PILASTER REINF IN CONCRETE WALL
NTS **CT-10**



SLAB ON GRADE CURB
NTS **CT-13**



COLUMN ISOLATION JOINT
NTS **CT-25**



EXTERIOR MECHANICAL PAD
NTS **CT-39**

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

NYL
Studio NYL
2995 Baseline Road, #314 303.558.3145
Boulder, Colorado 80303 www.studnyl.com
Boulder · Denver | Colorado Springs | Reston | Minneapolis

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21009

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

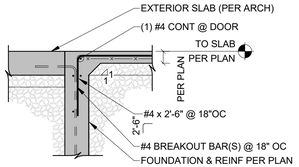
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

GRAPHICAL GENERAL NOTES

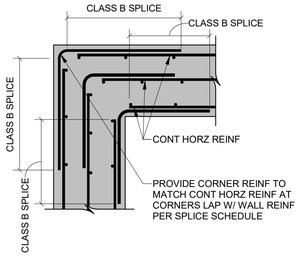
SG003

PLOT DATE: 3/22/2022 10:40:49 AM

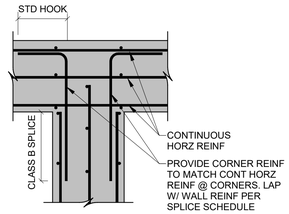
COPYRIGHT©



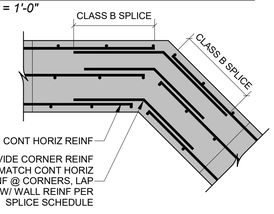
1 DOOR THRESHOLD
1/2" = 1'-0"



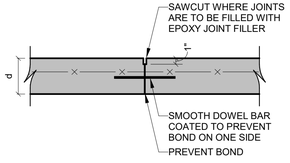
2 CORNER REINF IN CONCRETE FOOTING
3/4" = 1'-0"



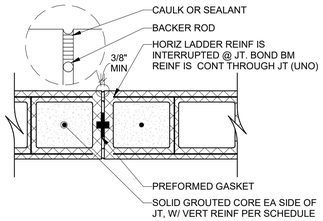
3 CORNER REINF IN CONCRETE FOOTING
3/4" = 1'-0"



4 CORNER REINF IN CONCRETE FOOTING
3/4" = 1'-0"

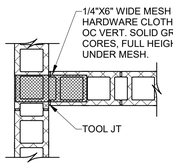


5 TYPICAL SLAB CONSTRUCTION JOINT
1" = 1'-0"

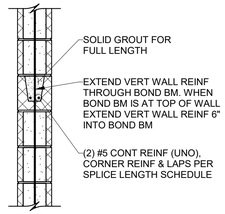


- VERT CONTROL JOINTS SHALL BE COORD W/ THE ARCH BUT SHALL NOT BE MORE THAN 20'-0" OC

CMU CONTROL JOINT
NTS **MS-02**

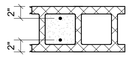


INTERSECTION OF CMU WALL (TOOTHED)
NTS **MS-03**

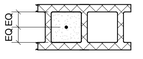


BOND BEAM
NTS **MS-04**

BARS @ FACE OF CORE

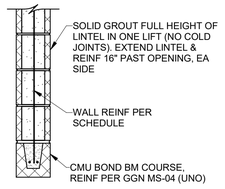


BAR CENTERED IN CORE



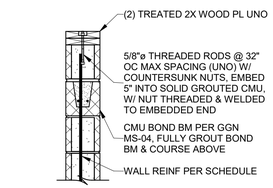
- SOLID GROUT ALL REINF CORES
- PROVIDE REINF POSITIONERS @ 48" VERT

REINF LOCATIONS IN CMU
NTS **MS-07**

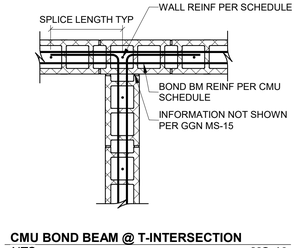


- SHORE LINTEL UNTIL ALL GROUTED CORES ARE CURED

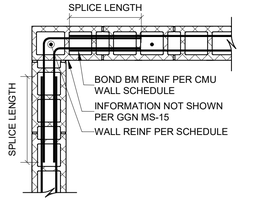
CMU LINTEL
NTS **MS-10**



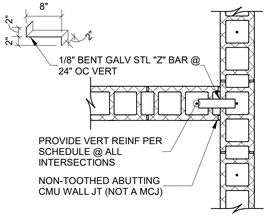
WOOD PLATES ON CMU WALLS
NTS **MS-12**



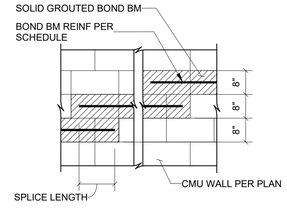
CMU BOND BEAM @ T-INTERSECTION
NTS **MS-13**



CMU BOND BEAM @ CORNER
NTS **MS-14**



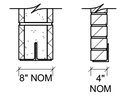
CMU WALL INTERSECTION (NON-TOOTHED)
NTS **MS-15**



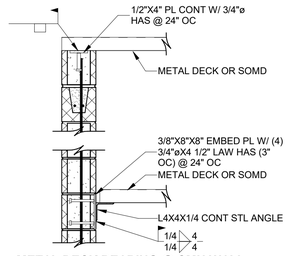
STEPPED BOND BEAM ELEVATION
NTS **MS-16**

NOTES:
• (1) ANGLE FOR EA 4" WYTHE
• PROVIDE 6" MIN BRG EA SIDE OF OPENING

OPENING WIDTH	ANGLE SIZE
3'11" OR LESS	L4X3 1/2X3/8 (LLV)
4'-0" TO 5'11"	L5X3 1/2X3/8 (LLV)
6'-0" TO 8'-0"	L6X3 1/2X3/8 (LLV)
8'-0" TO 12'-0"	L7X4X3/8 (LLV)



STEEL MASONRY LINTEL
NTS **MS-19**



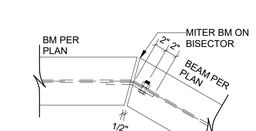
METAL DECK BEARING @ CMU WALL
NTS **MS-20**

MINIMUM SIZE OF FILLET WELDS

- WELD SIZE IS LEG DIM OF FILLET WELD. SINGLE PASS MUST BE USED.
- FOR MATERIAL LESS THAN 1/4" THICK, MAX WELD SHALL BE MATERIAL THK. FOR MATERIAL 1/4" THICK AND GREATER, MAX WELD SHALL BE MATERIAL THK LESS 1/16"

MATERIAL THICKNESS OF THINNER PART JOINED	MIN SIZE OF FILLET WELD
TO 1/2" INCLUSIVE	3/16"
OVER 1/2" TO 3/4" INCLUSIVE	1/4"
OVER 3/4"	5/16"

MINIMUM SIZE OF FILLET WELDS
NTS **ST-01**



- SIZE OF FILLET WELDS PER GGN ST-01, UNO.

PLATES WELDED TO W-SHAPES
NTS **ST-02**

- SIZE OF FILLET WELDS PER GGN ST-01, UNO.

PLATES WELDED TO HSS/PIPE-SHAPES
NTS **ST-03**

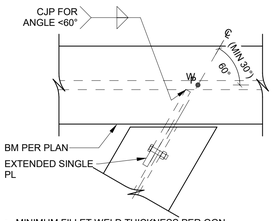
SINGLE PLATE CONNECTION - GGN ST-16				
• ALL BOLTS 3/4"ø A325N BOLTS IN STD OR SSLT HOLE, SNUG TIGHT.				
MEMBER SIZE(S)	**# OF BOLTS**	**PLT THICK**	**WELD 'A'**	**LENGTH 'L'**
C8, W8, C10 & W10	2	1/4"	3/16"	5 1/2"
C12, W12, W14	3	1/4"	3/16"	8 1/2"

SINGLE PLATE CONNECTION
NTS **ST-16**

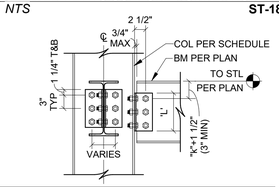
- SEE TABLE GGN ST-16 FOR INFORMATION NOT SHOWN

SKEWED SHEAR SPLICE
NTS **ST-17**

SKEWED PLT TO SUPPORT CONNECTION
NTS **ST-18**



- MINIMUM FILLET WELD THICKNESS PER GGN ST-01



- ALL BOLTS 3/4"ø A325N BOLTS IN SSD OR SSLT HOLE, SNUG TIGHT.
- (2) L4X3-1/2 W/ LONG LEG CONNECTED TO SUPPORTING MEMBER.

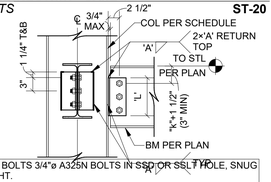
MEMBER SIZE(S)	# OF BOLTS	ANGLE THICK	LENGTH 'L'
C8, W8, C10 & W10	2	5/16"	5 1/2"
C12, W12 & W14	3	5/16"	8 1/2"

ALL BOLTED DOUBLE ANGLE CONNECTION
NTS **ST-19**

- ALL BOLTS 3/4"ø A325N BOLTS IN SSD OR SSLT HOLE, SNUG TIGHT.
- (2) L4X3-1/2 W/ LONG LEG CONNECTED TO SUPPORTING MEMBER.

MEMBER SIZE(S)	# OF BOLTS	ANGLE THICK	WELD 'A'	LENGTH 'L'
C8, W8, C10 & W10	2	5/16"	3/16"	5 1/2"
C12, W12 & W14	3	5/16"	3/16"	8 1/2"

BOLTED/WELDED DOUBLE ANGLE CONNECTION - CASE 1
NTS **ST-20**



- ALL BOLTS 3/4"ø A325N BOLTS IN SSD OR SSLT HOLE, SNUG TIGHT.
- (2) L4X3-1/2 W/ LONG LEG CONNECTED TO SUPPORTING MEMBER.

MEMBER SIZE(S)	# OF BOLTS	ANGLE THICK	WELD 'A'	LENGTH 'L'
C8, W8, C10 & W10	2	5/16"	1/4"	5 1/2"
C12, W12 & W14	3	5/16"	1/4"	8 1/2"

BOLTED/WELDED DOUBLE ANGLE CONNECTION - CASE 2
NTS **ST-21**

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

NYL

Studio **NYL**
2995 Baseline Road, #314 303.558.3145
Boulder, Colorado 80303 www.studnyl.com
Boulder | Denver | Colorado Springs | Hoster | Minneapolis

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21009

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

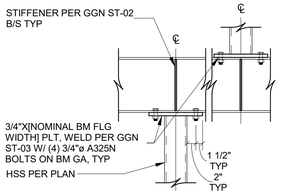
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

GRAPHICAL GENERAL NOTES

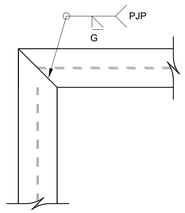
SG004

PLOT DATE: 3/22/2022 10:40:51 AM

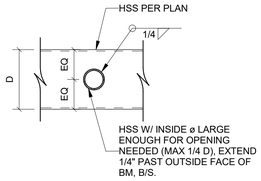
COPYRIGHT©



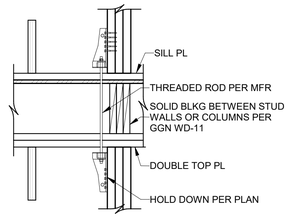
BEAM TO HSS COLUMN CONNECTIONS
NTS **ST-24**



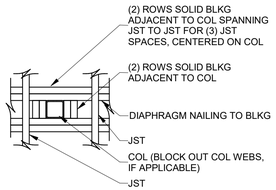
MITERED W SHAPES
NTS **ST-29**



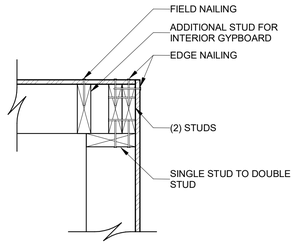
OPENING THROUGH HSS
NTS **ST-38**



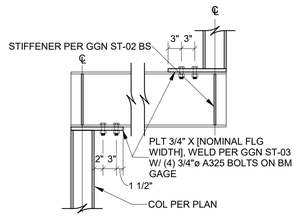
HOLD DOWN THROUGH FLOORS
NTS **WD-01**



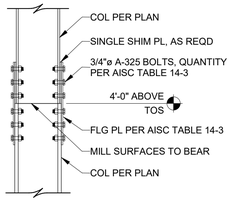
STL COLUMN BLOCKING @ FLOOR
NTS **WD-07**



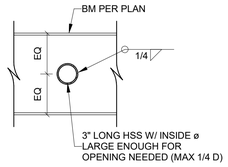
2x6 WALL CORNER
NTS **WD-13**



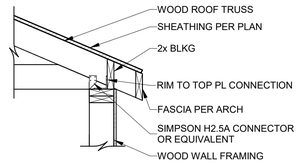
BEAM TO W COLUMN CONNECTIONS @ END OF BEAM
NTS **ST-25**



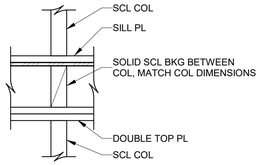
STL W COLUMN SPLICE
NTS **ST-32**



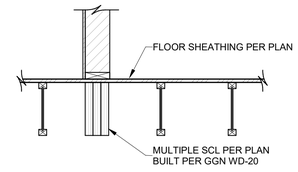
OPENING THROUGH WIDE FLANGE
NTS **ST-39**



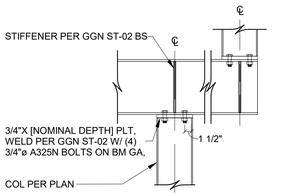
WOOD TRUSS BEARING CONNECTION
NTS **WD-02**



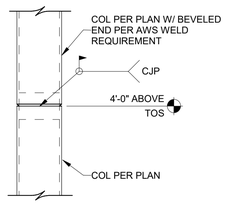
SCL COLUMNS THROUGH FLOORS
NTS **WD-08**



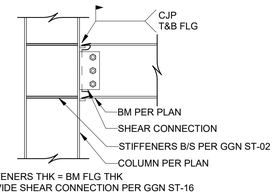
WALL BEARING ON BEAM PARALLEL TO JOIST
NTS **WD-14**



BEAM TO W COLUMN CONNECTIONS
NTS **ST-26**



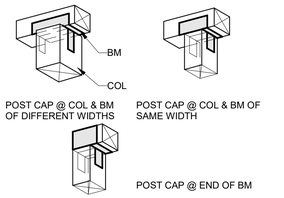
STL HSS COLUMN SPLICE
NTS **ST-33**



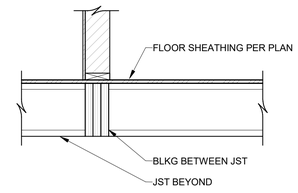
- STIFFENERS THK = BM FLG THK
- PROVIDE SHEAR CONNECTION PER GGN ST-16

BEAM MOMENT CONNECTION TO COLUMN FLANGE
NTS **ST-40**

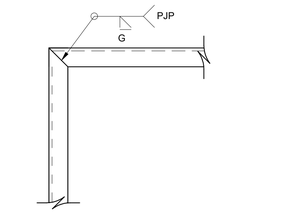
WOOD PLATE ON STEEL BEAM
NTS **WD-04**



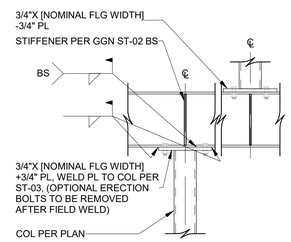
WOOD BEAM TO WOOD COLUMN CONNECTION
NTS **WD-09**



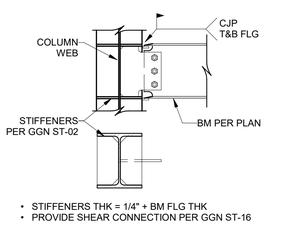
WALL BEARING ON BEAM PERPENDICULAR TO JOIST
NTS **WD-15**



MITERED C SHAPES OR ANGLES
NTS **ST-27**

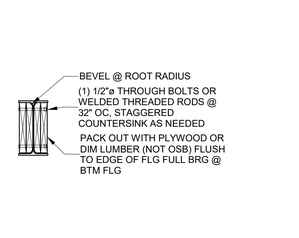


BEAM TO COLUMN FIELD WELD CONNECTIONS
NTS **ST-34**

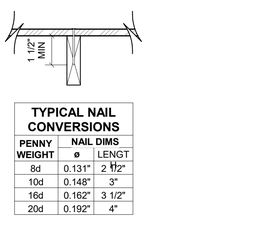


- STIFFENERS THK = 1/4" + BM FLG THK
- PROVIDE SHEAR CONNECTION PER GGN ST-16

BEAM MOMENT CONNECTION TO COLUMN WEB
NTS **ST-43**



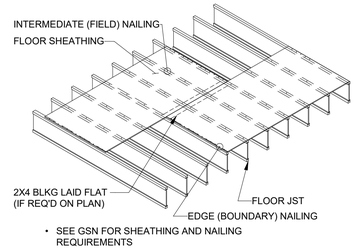
WOOD BLOCKING AT STEEL BEAM
NTS **WD-05**



TYPICAL NAIL CONVERSIONS

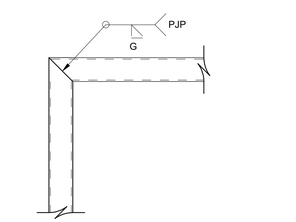
PENNY WEIGHT	NAIL DIMS	
	ø	LENGT
8d	0.131"	2 1/2"
10d	0.148"	3"
16d	0.162"	3 1/2"
20d	0.192"	4"

NAIL PENETRATION THROUGH SHEATHING
NTS **WD-11**

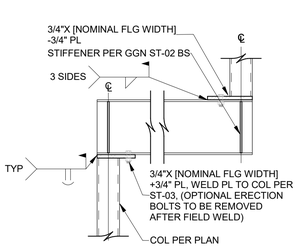


- SEE GSN FOR SHEATHING AND NAILING REQUIREMENTS

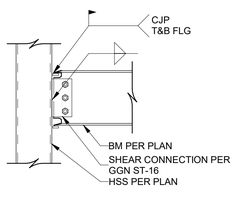
FLOOR SHEATHING ATTACHMENT
NTS **WD-16**



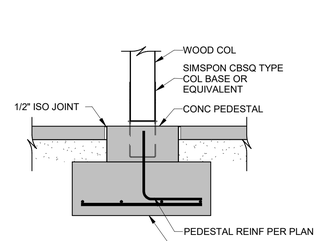
MITERED TUBE SHAPES
NTS **ST-28**



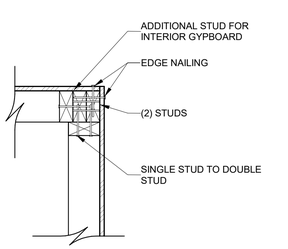
BEAM TO COLUMN FIELD WELD CONNECTIONS @ END OF BEAM
NTS **ST-35**



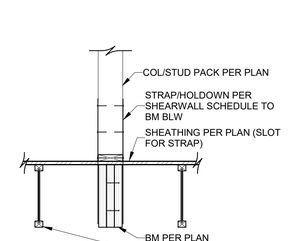
BEAM MOMENT CONNECTION TO HSS COLUMN
NTS **ST-44**



INTERIOR WOOD COLUMN
NTS **WD-06**



2x4 WALL CORNER
NTS **WD-12**



POST STRAP TO FLOOR BEAM
NTS **WD-17**

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

Studio **NYL**
2995 Baseline Road, #314 303.558.3145
Boulder, Colorado 80303 www.studionyl.com
Boulder | Denver | Colorado Springs | Reston | Minneapolis

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21009

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

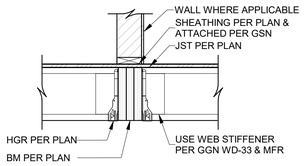
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

GRAPHICAL GENERAL NOTES

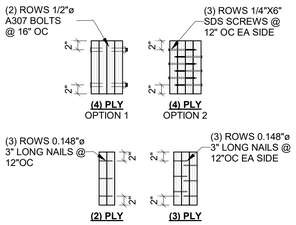
SG005

PLOT DATE: 3/22/2022 10:40:53 AM

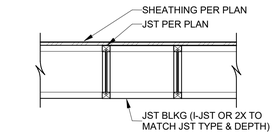
COPYRIGHT©



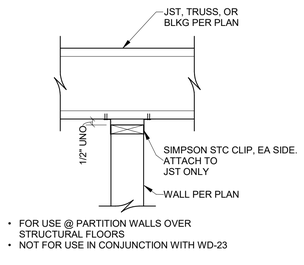
WOOD JOIST TO LVL BEAM
NTS **WD-19**



MULTI-PLY BEAM FASTENING
NTS **WD-20**

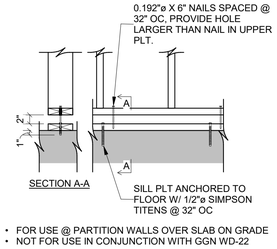


BLOCKING BETWEEN JOISTS
NTS **WD-21**



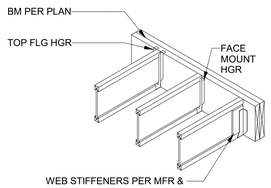
- FOR USE @ PARTITION WALLS OVER STRUCTURAL FLOORS
- NOT FOR USE IN CONJUNCTION WITH WD-23

SLIP JOINT @ INTERIOR PARTITION WALL
NTS **WD-22**

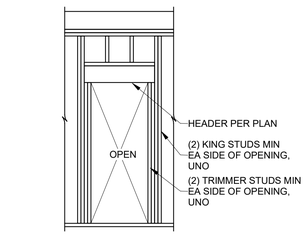


- FOR USE @ PARTITION WALLS OVER SLAB ON GRADE
- NOT FOR USE IN CONJUNCTION WITH GGN WD-22

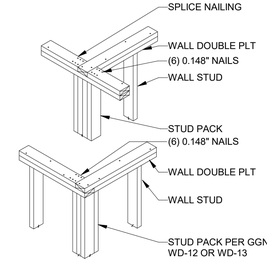
SLIP JOINT @ INTERIOR PARTITION WALL
NTS **WD-23**



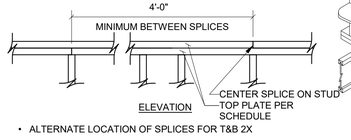
HANGER CONFIGURATION
NTS **WD-25**



OPENING IN WOOD WALL FRAMING
NTS **WD-26**

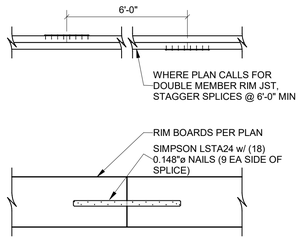


TOP PLATE INTERSECTIONS
NTS **WD-28**

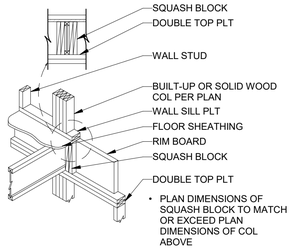


- ALTERNATE LOCATION OF SPLICES FOR T&B 2X

TOP PLATE SPLICE
NTS **WD-27**

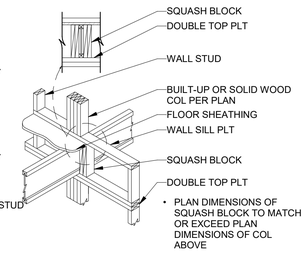


DOUBLE RIM BOARDS
NTS **WD-30**



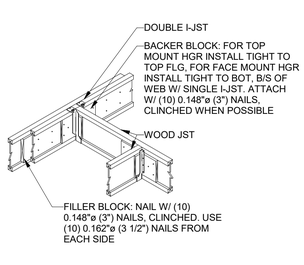
- PLAN DIMENSIONS OF SQUASH BLOCK TO MATCH OR EXCEED PLAN DIMENSIONS OF COL ABOVE

EXTERIOR SQUASH BLOCK
NTS **WD-31**

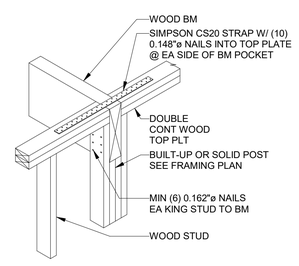


- PLAN DIMENSIONS OF SQUASH BLOCK TO MATCH OR EXCEED PLAN DIMENSIONS OF COL ABOVE

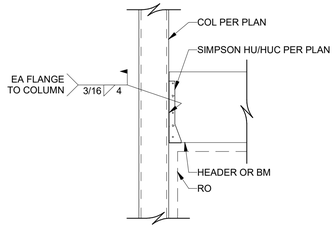
INTERIOR SQUASH BLOCK
NTS **WD-32**



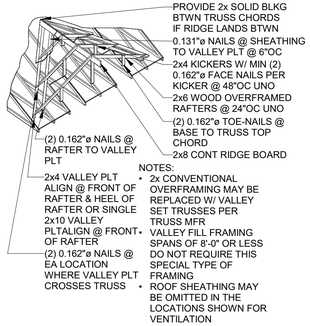
DOUBLE I-JOIST TRANSFER
NTS **WD-33**



BEAM TO STUD WALL
NTS **WD-34**

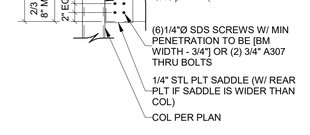


HANGER TO STEEL COLUMN
NTS **WD-35**

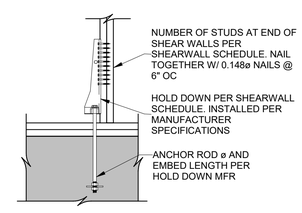


NOTES:
- 2x CONVENTIONAL OVERFRAMING MAY BE REPLACED W/ VALLEY SET TRUSSES PER TRUSS MFR
- VALLEY FILL FRAMING SPANS OF 8'-0" OR LESS DO NOT REQUIRE THIS SPECIAL TYPE OF FRAMING
- ROOF SHEATHING MAY BE OMITTED IN THE LOCATIONS SHOWN FOR VENTILATION

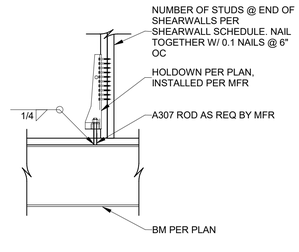
OVERFRAMING
NTS **WD-37**



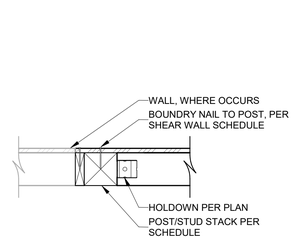
STEEL COLUMN SUPPORTING TIMBER BEAM
NTS **WD-38**



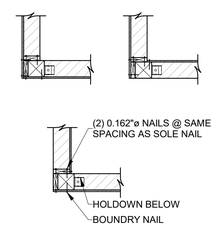
SHEAR WALL HOLD DOWN @ CONCRETE
NTS **WD-39**



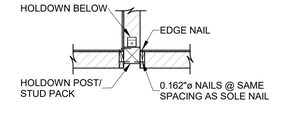
SHEAR WALL HOLD DOWN @ STEEL BEAM
NTS **WD-40**



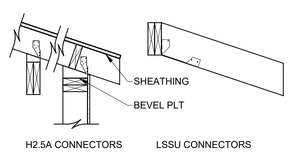
SHEARWALL HOLDOWN
NTS **WD-41**



SHEAR WALL CORNERS
NTS **WD-42**

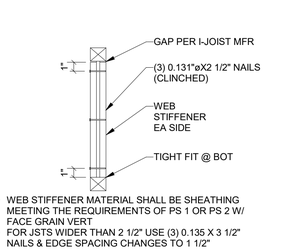


SHEARWALL INTERSECTION
NTS **WD-43**



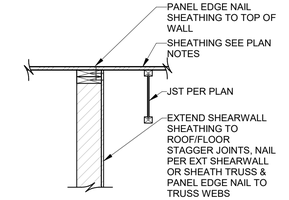
NOTE:
1. WHERE BIRDSMOUTH OR OTHER CONNECTION IS SPECIFICALLY SHOWN, PROVIDE JST HGR OR SEATS DESIGNED FOR THE SPECIFIC APPLICATION - SIMPSON H2.5A SERIES, LSSU SERIES OR EQUAL

SLOPED RAFTER CONNECTIONS
NTS **WD-44**



- WEB STIFFENER MATERIAL SHALL BE SHEATHING MEETING THE REQUIREMENTS OF PS 1 OR PS 2 W/ FACE GRAIN VERT
- FOR JSTS WIDER THAN 2 1/2" USE (3) 0.135 X 3 1/2" NAILS & EDGE SPACING CHANGES TO 1 1/2"

I-JOIST WEB STIFFENER ATTACHMENT
NTS **WD-45**



- IF RAFTER/JST/BM IS ABOVE SHEARWALL, CONTINUE SHEATHING TO UNDERSIDE OF ROOF/FLOOR SHEATHING. IF RAFTER/JST/ BM IS PERP TO SHEARWALL PROVIDE LSL OR LVL BKG BTWN RAFTER/JST/BM FOR EXTENT OF SHEARWALL.

SHEARWALL TO ROOF/FLOOR DIAPHRAGM
NTS **WD-46**

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

Studio NYL
2995 Baseline Road, #314 303.558.3145
Boulder, Colorado 80303 www.studnyl.com
Boulder | Denver | Colorado Springs | Kansas | Minneapolis

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21009

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

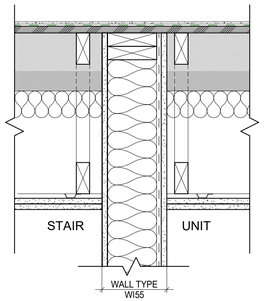
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

GRAPHICAL GENERAL NOTES

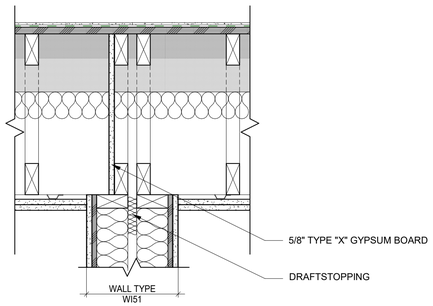
SG006

PLOT DATE: 3/22/2022 10:40:54 AM

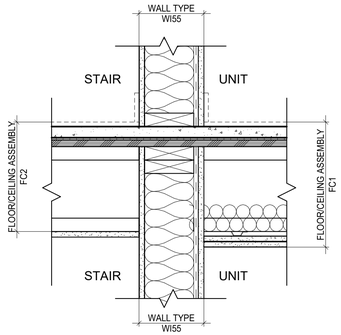
COPYRIGHT©



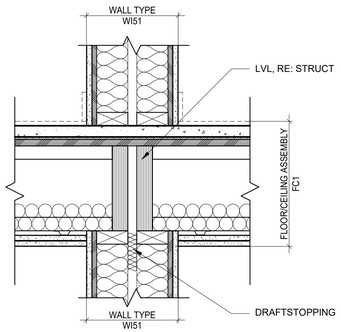
6 FIRE BARRIER @ ROOF / CEILING
1 1/2" = 1'-0"



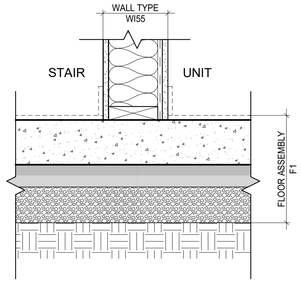
3 FIRE PARTITION @ ROOF / CEILING
1 1/2" = 1'-0"



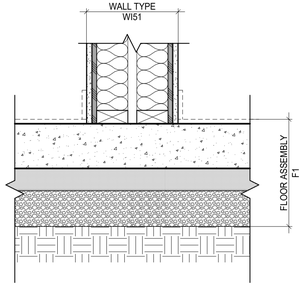
5 FIRE BARRIER @ FLOOR / CEILING
1 1/2" = 1'-0"



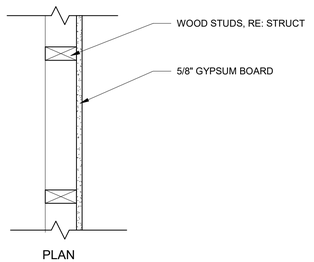
2 FIRE PARTITION @ FLOOR / CEILING
1 1/2" = 1'-0"



4 FIRE BARRIER @ SLAB ON GRADE
1 1/2" = 1'-0"

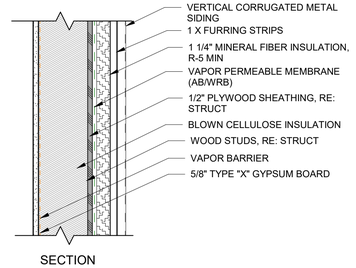


1 FIRE PARTITION @ SLAB ON GRADE
1 1/2" = 1'-0"



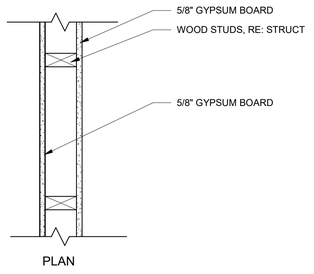
PLAN

WI53 2X4 INTERIOR PARTITION - FURRING WALL — NR
1 1/2" = 1'-0"



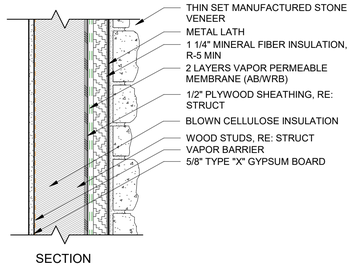
SECTION

WE54 2X6 WOOD STUD WITH CORRUGATED METAL — 1 HR
1 1/2" = 1'-0" — GA WP 8130



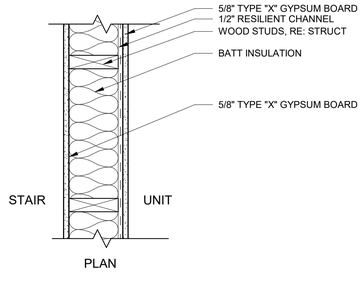
PLAN

WI52 2X4 INTERIOR PARTITION — NR
1 1/2" = 1'-0"



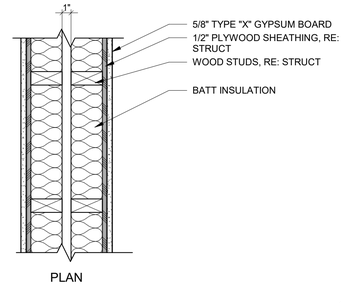
SECTION

WE53 2X6 WOOD STUD WITH STONE VENEER — 1 HR
1 1/2" = 1'-0" — GA WP 8130



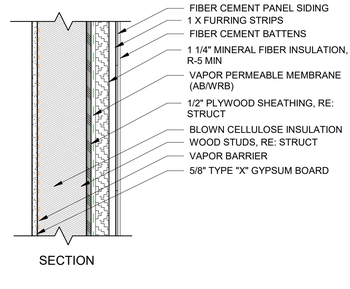
PLAN

WI55 2X6 UNIT / STAIR DEMISING WALL — 1HR
1 1/2" = 1'-0" — 50-54 STC
GA WP 3243



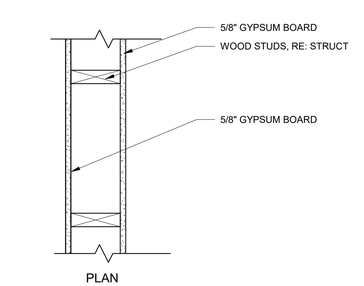
PLAN

WI51 UNIT TO UNIT DEMISING WALL — 1 HR
1 1/2" = 1'-0" — STC 54
UL U341



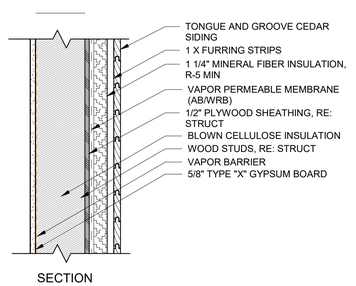
SECTION

WE52 2X6 WOOD STUD WITH FIBER CEMENT BOARD & BATTEN — 1 HR
1 1/2" = 1'-0" — GA WP 8130



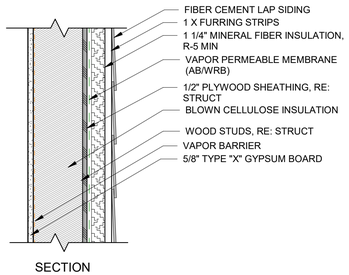
PLAN

WI54 2X6 INTERIOR PARTITION — NR
1 1/2" = 1'-0"



SECTION

WE55 2X6 WOOD STUD WITH T&G CEDAR SIDING — 1 HR
1 1/2" = 1'-0" — GA WP 8130



SECTION

WE51 2X6 WOOD STUD WITH FIBER CEMENT LAP SIDING — 1 HR
1 1/2" = 1'-0" — GA WP 8130

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

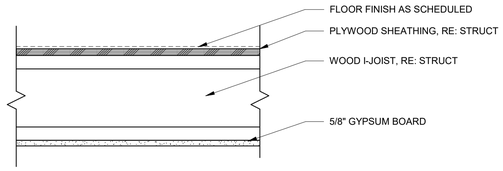
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

VERTICAL ASSEMBLY DETAILS

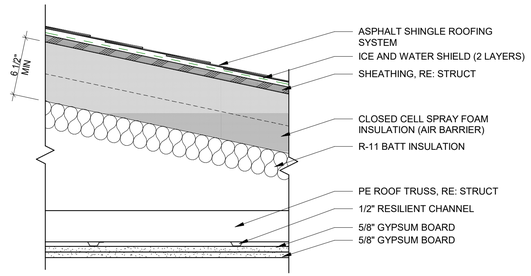
AG001

PLOT DATE: 3/28/2022 3:02:53 PM

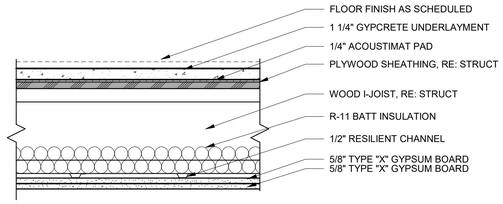
COPYRIGHT©



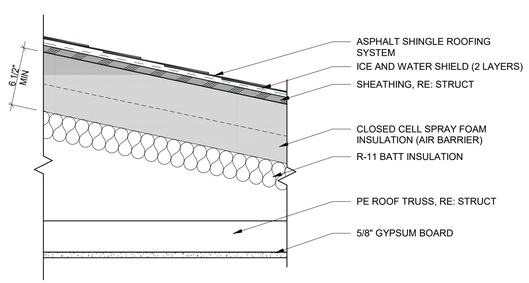
FC2 I-JOIST FLOOR-CEILING @ STAIR — NR
1 1/2" = 1'-0"



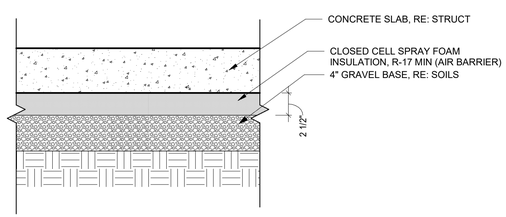
RC2 ROOF-CEILING ASSEMBLY - 1HR — 1 HR
1 1/2" = 1'-0" — UL P531



FC1 I-JOIST FLOOR-CEILING — 1 HR, STC 58, IIC 54-81
1 1/2" = 1'-0" — UL L570



RC1 ROOF-CEILING ASSEMBLY — NR
1 1/2" = 1'-0"



F1 CONC. SLAB ON GRADE — NR
1 1/2" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

HORIZONTAL ASSEMBLY DETAILS

AG002

PLOT DATE: 3/28/2022 3:02:54 PM

COPYRIGHT©

UL Product iQ™

BXUV.U305

Design/System/Construction/Assembly Usage Disclaimer

- Authorities Having Jurisdiction should be consulted in all cases as to the particular requirements covering the installation and use of UL Certified products, equipment, system, devices, and materials.
- Authorities Having Jurisdiction should be consulted before construction.
- Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with applicable requirements. The published information cannot always address every construction nuance encountered in the field.
- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.
- Only products which bear UL's Mark are considered Certified.

BXUV - Fire Resistance Ratings - ANSI/UL 263 Certified for United States
BXUV7 - Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada

See General Information for Fire-resistance Ratings - ANSI/UL 263 Certified for United States
Design Criteria and Allowable Variances

See General Information for Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada
Design Criteria and Allowable Variances

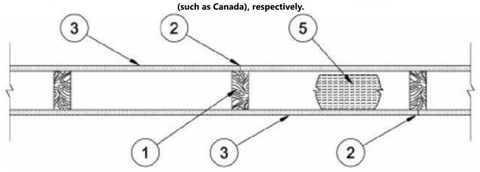
Design No. U305

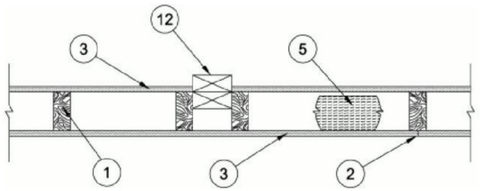
July 29, 2021

Bearing Wall Rating — 1 Hr
Finish Rating — See Items 3, 3A, 3D, 3E, 3F, 3G, 3H, 3J and 3L.
STC Rating - 56 (See Item 9)

This design was evaluated using a load design method other than the Limit States Design Method (e.g., Working Stress Design Method). For jurisdictions employing the Limit States Design Method, such as Canada, a load restriction factor shall be used — See Guide BXUV or BXUV7

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**





1. **Wood Studs —** Nom 2 by 4 in. spaced 16 in. OC max, effectively firestopped.

2. **Joints and Nail-Heads —** Joints covered with joint compound and paper tape. Joint compound and paper tape may be omitted when square edge boards are used. As an alternate, nom 3/32 in. thick gypsum veneer plaster may be applied to the entire surface of Classified veneer baseboard with the joints reinforced with paper tape. Nailheads exposed or covered with joint compound.

3. **Gypsum Board* —** 5/8 in. thick paper or vinyl surfaced, with beveled, square, or tapered edges, applied either horizontally or vertically. Gypsum panels nailed 7 in. OC with 6d cement coated nails 1-7/8 in. long, 0.0915 in. shank diam and 15/64 in. diam heads. When used in widths other than 48 in., gypsum panels are to be installed horizontally. For an alternate method of attachment of gypsum panels, refer to Items 6 through 6F, **Steel Framing Members***.
When Items 6, 6B, 6C, 6D, 6E, or 6F, **Steel Framing Members***, are used, gypsum panels attached to furring channels with 1 in. long Type S bugle-head steel screws spaced 12 in. OC.

When Item 6A, **Steel Framing Members***, is used, two layers of gypsum panels attached to furring channels. Base layer attached to furring channels with 1 in. long Type S bugle-head steel screws spaced 12 in. OC. Face layer attached to furring channels with 1-5/8 in. long Type S bugle-head steel screws spaced 12 in. OC. All joints in face layers staggered with joints in base layers. One layer of gypsum board attached to opposite side of wood stud without furring channels as described in Item 3.

When Item 7, resilient channels are used, 5/8 in. thick, 4 ft wide gypsum panels applied vertically. Screw attached furring channels with 1 in. long, self-drilling, self-tapping Type S or S-12 steel screws spaced 8 in. OC, vertical joints located midway between studs.

AMERICAN GYPSUM CO — Types AGX-1(finish rating 23 min.), M-Glass (finish rating 23 min.), Type AGX-11 (finish rating 26 min), Type AGX-12 (finish rating 22 min), Type LightRoc (finish rating 23 min.) or Type AG-C

BEIJING NEW BUILDING MATERIALS PUBLIC LTD CO — Type DBX-1 (finish rating 24 min)

CABOT MANUFACTURING ULC — Type X (finish rating 22 min), 5/8 Type X, Moisture Resistant Type X, Gypsum Sheathing Type X, Mold & Mildew Resistant Type X and Mold & Mildew Resistant AR Type X, Type Blueglass Exterior Sheathing

CERTAINTEED GYPSUM INC — Type C, Type X or Type X-1 (finish rating 26 min); Type EGRG or GlasRoc (finish rating 23 min), GlasRoc-2, Type Habito (finish rating 26 min).

CGC INC — Type AR (finish rating 24 min), Type C (finish rating 24 min), Type IP-AR (finish rating 24 min), Type IPC-AR (finish rating 24 min), Type IP-X1 (finish rating 24 min), Type IP-X2 (finish rating 24 min), Type SCX (finish rating 24 min), Type SHX (finish rating 24 min), Type ULX (finish rating 22 min), Type WRC (finish rating 24 min), Type WRX (finish rating 24 min), Type ULIX (finish rating 20 min)

CERTAINTEED GYPSUM INC — Type LGFC6A (finish rating 34 min), Type LGFC2A, Type LGFC-C/A, Type LGFC-WD, Type LGLLX (finish rating 21 min), Type CLLX (finish rating 24 min)

GEORGIA-PACIFIC GYPSUM L L C — Type 5 (finish rating 26 min), Type 6 (finish rating 23 min), Type 9 (finish rating 26 min), Type C (finish rating 26 min), Type DGG (finish rating 20 min), Type GPFS1 (finish rating 20 min), Type GPFS2 (finish rating 20 min), Type GPFS6 (finish rating 26 min), Type DS, Type DAP, Type DD (finish rating 20 min), Type DA, Type DAPC, Type LS (finish rating 23 min), Type X, Veneer Plaster Base - Type X, Water Rated - Type X, Sheathing - Type X, Soffit - Type X, Type LWX (finish rating 22 min), Veneer Plaster Base-Type LWX (finish rating 22 min), Water Rated-Type LWX (finish rating 22 min), Sheathing Type-LWX (finish rating 22 min), Soffit-Type LWX (finish rating 22 min), Type DGLW (finish rating 22 min), Water Rated-Type DGLW (finish rating 22 min), Sheathing Type- DGLW (finish rating 22 min), Soffit-Type DGLW (finish rating 22 min), Type LWX (finish rating 22 min), Type LW2X (finish rating 22 min), Veneer Plaster Base - Type LW2X (finish rating 22 min), Water Rated - Type LW2X (finish rating 22 min), Sheathing - Type LW2X (finish rating 22 min), Soffit - Type LW2X (finish rating 22 min), Type DGL2W (finish rating 22 min), Water Rated - Type DGL2W (finish rating 22 min), Sheathing - Type DGL2W (finish rating 22 min)

NATIONAL GYPSUM CO — Type FSK (finish rating 20 min), Type FSK-G (finish rating 20 min), Type FSW (finish rating 20 min), Type FSW-2 (finish rating 24 min), Type FSW-3 (finish rating 20 min), Type FSW-5 (finish rating 22 min), Type FSW-G (finish rating 20 min), Type FSK-C (finish rating 20 min), Type FSW-C (finish rating 20 min), Type FSMR-C, Type FSW-6 (finish rating 20 min), Type FSL (finish rating 24 min), Type FSW-8, Type FSLX (finish rating 21 min), Type RSX (finish rating 26 min).

NATIONAL GYPSUM CO — Riyadh, Saudi Arabia — Type FR, or WR.

PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM — Types C, PG-2 (finish rating 20 min), PG-3 (finish rating 20 min), Types PG-3W, PG-5W (finish rating 20 min), Type PG-4 (finish rating 20 min), Type PG-6 (finish rating 23 min), Types PG-3WS, PG-5WS, PGS-WRS (finish rating 20 min), Types PG-5, PG-9 (finish rating 26 min), PG-11 PG-13 (Nails increased to 2 in.), Type PG-C or PGI (finish rating 26 min)

PANEL REY S A — Type GREX, GRIX, PRX, PRC, PRC2; Types RHX, Guard Rey, MDX, ETX (finish rating 22 min), PRX2 (finish rating 21 min)

SIAM GYPSUM INDUSTRY (SARABURI) CO LTD — Type EX-1 (finish rating 26 min)

THAI GYPSUM PRODUCTS PCL — Type C, Type X (finish rating 26 min)

UNITED STATES GYPSUM CO — Type AR (finish rating 24 min), Type C (finish rating 24 min), Type FRX-G (finish rating 29 min), Type IP-AR (finish rating 24 min), Type IPC-AR (finish rating 24 min), Type IP-X1 (finish rating 24 min), Type IP-X2 (finish rating 24 min), Type SHX (finish rating 24 min), Type SCX (finish rating 24 min), Type SGX (finish rating 24 min), Type ULX (finish rating 22 min), Type WRX (finish rating 24 min), Type WRC (finish rating 24 min), Type ULIX (finish rating 20 min)

USG BORAL DRYWALL SFZ LLC — Type SGX (finish rating 24 min).

USG MEXICO S A DE C V — Type AR (finish rating 24 min), Type C (finish rating 24 min), Type WRX (finish rating 24 min), Type WRC (finish rating 24 min), Type IP-X1 (finish rating 24 min), Type IP-X2 (finish rating 24 min), Type SHX (finish rating 24 min), SCX (finish rating 24 min), Type IP-AR (finish rating 24 min), Type IPC-AR (finish rating 24 min), Type ULX (finish rating 22 min)

3A. **Gypsum Board* —** (As an alternate to Item 3) — 5/8 in. thick gypsum panels, with beveled, square, or tapered edges, applied either horizontally or vertically. Gypsum panels fastened to framing with 1-1/4 in. long Type W coarse thread gypsum panel steel screws spaced a max 8 in. OC, with last screw 1 in. from edge of board. When used in widths of other than 48 in., gypsum boards are to be installed horizontally.

AMERICAN GYPSUM CO — Types AGX-1 (finish rating 25 min.), M-Glass (finish rating 25 min.), AG-C (finish rating 25 min.), LighttRoc (finish rating 25 min.)

CERTAINTEED GYPSUM INC — Type C, Type X, Type X-1 (finish rating 26 min), Type EGRG or GlasRoc.

CGC INC — Type AR (finish rating 24 min), Type C (finish rating 24 min), Type IP-AR (finish rating 24 min), Type IPC-AR (finish rating 24 min), Type IP-X1 (finish rating 24 min), Type IP-X2 (finish rating 24 min), Type SCX (finish rating 24 min), Type SHX (finish rating 24 min), Type WRC (finish rating 24 min), Type WRX (finish rating 24 min)

NATIONAL GYPSUM CO — Type FSW (finish rating 24 min)

UNITED STATES GYPSUM CO — Type AR (finish rating 24 min), Type SCX (finish rating 24 min), Type SGX (finish rating 24 min), Type C (finish rating 24 min), Type WRX (finish rating 24 min), Type WRC (finish rating 24 min), Type IP-X1 (finish rating 24 min), Type IP-X2 (finish rating 24 min), Type SHX (finish rating 24 min), Type FRX-G (finish rating 24 min), Type IP-AR (finish rating 24 min), Type IPC-AR (finish rating 24 min)

USG BORAL DRYWALL SFZ LLC — Types C, SCX, SGX (finish rating 24 min).

USG MEXICO S A DE C V — Type AR (finish rating 24 min), Type C (finish rating 24 min), Type WRX (finish rating 24 min), Type WRC (finish rating 24 min), Type IP-X1 (finish rating 24 min), Type IP-X2 (finish rating 24 min), Type SHX (finish rating 24 min), Type SCX, Type IP-AR (finish rating 24 min), Type IPC-AR (finish rating 24 min)

3B. **Gypsum Board* —** (As an alternate to Item 3) — Nom 3/4 in. thick, installed with 1-7/8 in. long cement coated nails as described in Item 3 or 1-3/8 in. long Type W coarse thread gypsum panel steel screws as described in Item 3A.
CGC INC — Types AR, IP-AR

UNITED STATES GYPSUM CO — Types AR, IP-AR

USG MEXICO S A DE C V — Types AR, IP-AR

3C. **Gypsum Board* —** (As an alternate to Items 3, 3A and 3B) — 5/8 in. thick, 2 ft wide, tongue and groove edge, applied horizontally to one side of the assembly. Installed with 1-7/8 in. long cement coated nails as described in Item 3 or 1-1/4 in. long Type W coarse thread gypsum panel steel screws as described in Item 3A. Joint covering (Item 2) not required.
CGC INC — Type SHX

UNITED STATES GYPSUM CO — Type SHX

USG MEXICO S A DE C V — Type SHX

3D. **Gypsum Board* —** (As an alternate to Items 3, 3A, 3B, or 3C — Not Shown) — For Direct Application to Studs Only- Nom 5/8 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Wallboard secured to studs with 1-5/8 in. long Type W coarse thread gypsum panel steel screws spaced 8 in. OC at perimeter and in the field. Lead batten strips required behind vertical joints of lead backed gypsum wallboard and optional at remaining stud locations. Lead batten strips, min 1-1/2 in. wide, max 10 ft long with a max thickness of 0.125 in. placed on the face of studs and attached to the stud with two 1 in. long Type S-12 pan head steel screws, one at the top of the strip and one at the bottom of the strip. Lead discs or tabs may be used in lieu of or in addition to the lead batten strips or optional at other locations. Max 3/4 in. diam by max 0.125 in. thick lead discs compression fitted or adhered over steel screw heads or max 1/2 in. by 1-1/4 in. by max 0.125 in. thick lead tabs placed on gypsum boards underneath screw locations prior to the installation of the screws. Lead batten strips to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C".
RAY-BAR ENGINEERING CORP — Type RB-LBG (finish rating 24 min)

3E. **Gypsum Board* —** (As an alternate to Items 3, 3A, 3B, 3C, and 3D) — 5/8 in. thick gypsum panels, with square edges, applied either horizontally or vertically. Gypsum panels fastened to framing with 1-1/4 in. long Type W coarse thread gypsum panel steel screws spaced a max 8 in. OC, with last 2 screws 1 and 4 in. from edge of board or nailed 7 in. OC with 6d cement coated nails 1-7/8 in. long, 0.0915 in. shank diam and 15/64 in. diam heads. When used in widths of other than 48 in., gypsum boards are to be installed horizontally.
GEORGIA-PACIFIC GYPSUM L L C — Type DGG (finish rating 20 min), GreenGlass Type X (finish rating 23 min)

3F. **Gypsum Board* —** (As an alternate to Items 3, 3A, 3B, 3C, 3D, and 3E) — 5/8 in. glass-mat faced with square edges, applied either horizontally or vertically. Gypsum panels nailed 7 in. OC around the perimeter and in the field with 6d cement coated nails 1-7/8 in. long, 0.0915 in. shank diam and 15/64 in. diam heads. Nails shall be placed 1 inch and 3 inch from horizontal joints and 7 inch OC thereafter.
CGC INC — Type USGX (finish rating 22 min)

UNITED STATES GYPSUM CO — Type USGX (finish rating 22 min.)

USG BORAL DRYWALL SFZ LLC — , Type USGX (finish rating 22 min.)

USG MEXICO S A DE C V — Type USGX (finish rating 22 min.)

3G. **Gypsum Board* —** (As an alternate to Items 3 through 3F) — 5/8 in. thick paper surfaced applied vertically. Gypsum panels nailed 7 in. OC with 6d cement coated nails 1-7/8 in. long, 0.0915 in. shank diam and 15/64 in. diam heads.
GEORGIA-PACIFIC GYPSUM L L C — Type X ComfortGuard Sound Deadening Gypsum Board (finish rating 27 min)

3H. **Gypsum Board* —** (As an alternate to Items 3) — Not to be used with items 6 or 7. 5/8 in. thick paper surfaced applied vertically only. Gypsum panels nailed 7 in. OC with 6d cement coated nails 1-7/8 in. long, 0.0915 in. shank diam and 15/64 in. diam heads.
NATIONAL GYPSUM CO — Type SBWB

3I. **Gypsum Board* —** (As an alternate to Items 3 through 3H, Not Shown) — Nominal 5/8 in. thick, 4 ft wide panels, applied vertically. Panels nailed 7 in. OC with 6d cement coated nails 1-7/8 in. long, 0.0915 in. shank diam and 15/64 in. diam heads. Panel joints covered with paper tape and two layers of joint compound. Nailheads covered with two layers of joint compound.
PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM — Type QuietRock ES (finish rating 20 min)

3J. **Gypsum Board* —** (As an alternate to Item 3) — 5/8 in. thick paper surfaced applied vertically or horizontally. Gypsum panels secured per item 3 or 3A.
CERTAINTEED GYPSUM INC — Type SilentFX

3K. **Gypsum Board* —** (As an alternate to Item 3) — 5/8 in. thick gypsum panels, with beveled, square, or tapered edges, applied either horizontally or vertically. Gypsum panels fastened to framing with 1-1/4 in. long Type W coarse thread gypsum panel steel screws spaced a maximum 8 in. OC with the last screw 1 in. from the edge of the board. When used in widths other than 48 in., gypsum panels are to be installed horizontally.
NATIONAL GYPSUM CO — Type FSK (finish rating 20 min), Type FSK-G (finish rating 20 min), Type FSW (finish rating 20 min), Type FSW-2 (finish rating 24 min), Type FSW-3 (finish rating 20 min), Type FSW-5 (finish rating 22 min), Type FSW-G (finish rating 20 min), Type FSK-C (finish rating 20 min), Type FSW-C (finish rating 20 min), Type FSMR-C, Type FSW-6 (finish rating 20 min), Type FSL (finish rating 24 min).

3L. **Gypsum Board* —** (As an alternate to Item 3) — For Direct Application to Studs Only — Nom 5/8 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Wallboard secured to studs with 1-5/8 in. long Type W coarse thread gypsum panel steel screws spaced 8 in. OC at perimeter and in the field. Lead batten strips required behind vertical joints of lead backed gypsum wallboard and optional at remaining stud locations. Lead batten strips, min 2 in. wide, max 10 ft long with a max thickness of 0.140 in. placed on the face of studs and attached to the stud with two 1 in. long Type S-8 pan head steel screws, one at the top of the strip and one at the bottom of the strip. Lead discs, max 5/16 in. diam by max 0.140 in. thick. compression fitted or adhered over the screw heads. Lead batten strips to have a purity of 99.5% meeting the Federal specification QQ-L-201f, Grades "B, C or D".
MAYCO INDUSTRIES INC — "X-Ray Shielded Gypsum"

3M. **Gypsum Board* —** (As an alternate to Items 3) — For Direct Application to Studs Only — For use as the base layer or as the face layer. Nom 5/8 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Wallboard secured to studs with 1-5/8 in. long Type W coarse thread gypsum panel steel screws spaced 8 in. OC at perimeter and in the field when applied as the base layer. When applied as the face layer screw length to be increased to 2-1/2 in. Lead batten strips required behind vertical joints of lead backed gypsum wallboard and optional at remaining stud locations. Lead batten strips, min 2 in. wide, max 8 ft long with a max thickness of 0.14 in. placed on the face of studs and attached to the stud with construction adhesive and two 1 in. long Type S-12 pan head steel screws, one at the top of the strip and one at the bottom of the strip. Lead discs, nominal 3/8 in. diam by max 0.085 in. thick. Compression fitted or adhered over the screw heads. Lead batten strips and discs to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C". Fasteners for face layer gypsum panels (Items 4, 4A or 4B) when installed over lead backed board to be min 2-1/2 in. Type S-12 bugle head steel screws spaced as described in Item 4.
RADIATION PROTECTION PRODUCTS INC — Type RPP - Lead Lined Drywall

3N. **Gypsum Board* —** (As an alternate to Item 3) — 5/8 in. thick, 4 ft. wide, applied horizontally or vertically with vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Secured as described in Item 3 or 3A.
CERTAINTEED GYPSUM INC — Easi-Lite Type X (finish rating 24 min), Easi-Lite Type X-2 (finish rating 24 min)

3O. **Wall and Partition Facings and Accessories* —** (As an alternate to Item 3, Not Shown) — Nominal 5/8 in. thick, 4 ft wide panels, applied vertically. Panels nailed 7 in. OC with 6d cement coated nails 1-7/8 in. long, 0.0915 in. shank diam and 15/64 in. diam heads. Panel joints covered with paper tape and two layers of joint compound. Nailheads covered with two layers of joint compound.

PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM — Type QuietRock 527 (finish rating 24 min).

3P. **Gypsum Board* —** (As an alternate to Item 3, Not Shown) — Two layers nom. 5/16 in. thick gypsum panels applied vertically or horizontally. Horizontal edge joints and horizontal butt joints on opposite sides of studs need not be staggered or backed by wood studs. Horizontal joints on the same side between face and base layers need not be staggered. Base layer gypsum panels fastened to studs with 1-1/4 in. long drywall nails spaced 8 in. OC. Face layer gypsum panels fastened to studs with 1-7/8 in. long drywall nails spaced 8 in. OC starting with a 4" stagger.
NATIONAL GYPSUM CO — Type FSW (finish rating 25 min)

3Q. **Gypsum Board* —** (As an alternate to Item 3) — 5/8 in. thick gypsum panels, with beveled, square, or tapered edges, applied either horizontally or vertically. Gypsum panels fastened to framing with 1-1/4 in. long Type W coarse thread gypsum panel steel screws spaced a maximum 10 in. OC with the last two screws 4 and 1 in. from the edges of the board. When used in widths other than 48 in., gypsum panels are to be installed horizontally.
CERTAINTEED GYPSUM INC — Type LGFC6A (finish rating 21 min), Type LGFC2A, Type LGFC-C/A, Type LGFC-WD, Type LGLLX

3R. **Gypsum Board* —** (As an alternate to Item 3. For use with Item 5H) — Any 5/8 in. thick, 4 ft. wide, Gypsum Board listed in Item 3 above. Applied either horizontally or vertically, and screwed to panels with 1-5/8 in. long Type W coarse thread steel screws at 8 in. OC at perimeter and in the field with the last two screws 4 and 3/4 in. from the edges of the board when applied as the base layer. When used in widths other than 48 in., gypsum panels are to be installed horizontally.

3S. **Gypsum Board* —** 3/4 in. thick paper or vinyl surfaced, with beveled, square, or tapered edges, applied either horizontally or vertically. Gypsum panels secured as described in Item 3 with nail length increased to 2 in.
PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM — Type PG-13

3T. **Wall and Partition Facings and Accessories* —** (As an alternate to 5/8 in. thick board as outlined in Item 3) — Nominal 1-3/8 in. thick, 4 ft wide panels, applied vertically or horizontally. Fastened with #6 x 2 in. long drywall screws spaced 8 in. OC along the perimeter and 12 in. OC in the field.
PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM — Type QuietRock 545

3U. **Gypsum Board* —** (As an alternate to Item 3 - For use with Foamed Plastic products, Item 5J) — 5/8 in. thick, 4 ft. wide, applied vertically with vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Gypsum panels nailed 7 in. OC with 6d cement coated nails 1-7/8 in. long, 0.0915 in. shank diam and 15/64 in. diam heads.
AMERICAN GYPSUM CO — Types AGX-1

BEIJING NEW BUILDING MATERIALS PUBLIC LTD CO — Type DBX-1

CABOT MANUFACTURING ULC — Type X

CERTAINTEED GYPSUM INC — Type X

CGC INC — Type SCX

PANEL REY S A — Type PRX

SIAM GYPSUM INDUSTRY (SARABURI) CO LTD — Type EX-1

THAI GYPSUM PRODUCTS PCL — Type X

UNITED STATES GYPSUM CO — Types SCX and SGX

USG BORAL DRYWALL SFZ LLC — Types SCX and SGX

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

0" 1" THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

UL U305

AG011

PLOT DATE: 3/28/2022 3:02:55 PM

COPYRIGHT©

USG MEXICO S A DE C V — Type SCX

3V. **Gypsum Board* —** (As an alternate to Item 3. For use with Item 5K) — Any 5/8 in. thick, 4 ft. wide, Gypsum Board listed in Item 3 above. Applied vertically with vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Gypsum panels secured to studs with 1-5/8 in. long Type W coarse thread gypsum panel steel screws spaced 8 in. OC at perimeter and in the field.

4. **Steel Corner Fasteners —** (Optional) — For use at wall corners. Channel shaped, 2 in. long by 1 in. high on the back side with two 1/8 in. wide cleats protruding into the 5/8 in. wide channel, fabricated from 24 gauge galv steel. Fasteners applied only to the end or cut edge (not along tapered edges) of the gypsum board, no greater than 2 in. from corner of gypsum board, max spacing 16 in. OC. Nailed to adjacent stud through tab using one No. 6d cement coated nail per fastener. Corners of wall board shall be nailed to top and bottom plate using No. 6d cement coated nails.

5. **Batts and Blankets* —** (Optional — Required when Item 6A is used (RC-1)) — Glass fiber or mineral wool insulation. Placed to completely or partially fill the stud cavities. When Item 6A is used, glass fiber or mineral wool insulation shall be friction-fitted to completely fill the stud cavities.
CERTAINTEED CORP

JOHNS MANVILLE

KNAUF INSULATION LLC

MANSON INSULATION INC

ROCKWOOL — Types Acoustical Fire Batts and Type AFB, min. density 1.69 pcf / 27.0 kg/m^3

ROCKWOOL MALAYSIA SDN BHD — Type Acoustical Fire Batts

ROCK WOOL MANUFACTURING CO — Delta Board

THERMAFIBER INC — Type SAFB, SAFB FF

5A. **Fiber, Sprayed* —** (Not Shown — Not for use with Item 6) — As an alternate to Batts and Blankets (Item 5) — Spray applied cellulose material. The fiber is applied with water to completely fill the enclosed cavity in accordance with the application instructions supplied with the product with a nominal dry density of 2.7 lb/ft^3, Alternate Application Method: The fiber is applied without water or adhesive at a nominal dry density of 3.5 lb/ft^3, in accordance with the application instructions supplied with the product. When Item 6B is used, Fiber, Sprayed shall be INS735, INS745, INS750LD, INS765LD, INS773LD or SANCTUARY.

U S GREENFIBER L L C — INS735, INS745, INS750LD and SANCTUARY for use with wet or dry application. INS515LD, INS541LD, INS735, INS765LD, and INS773LD are to be used for dry application only

5B. **Fiber, Sprayed* —** (Not Shown - Not for use with Item 6) — As an alternate to Batts and Blankets (Item 5) - Spray applied cellulose insulation material. The fiber is applied with water to interior surfaces in accordance with the application instructions supplied with the product. Applied to completely fill the enclosed cavity. Minimum dry density of 4.3 pounds per cubic ft.
NU-WOOL CO INC — Cellulose Insulation

5C. **Batts and Blankets* —** Required for use with resilient channels, Item 7, 3 in. thick mineral wool batts, friction-fitted to fill interior of wall.
THERMAFIBER INC — Type SAFB, SAFB FF

5D. **Glass Fiber Insulation —** (As an alternate to Item 5C) — 3 in. thick glass fiber batts bearing the UL Classification Marking as to Surface Burning and/or Fire Resistance, friction-fitted to fill the interior of the wall. See **Batts and Blankets** (BKNV or BZJZ) Categories for names of Classified companies.

5E. **Batts and Blankets* —** (Required for use with Wall and Partition Facings and Accessories, Item 3D) — Glass fiber insulation, nom 3-1/2 in. thick, min. density of 0.80 pcf, with a flame spread of 25 or less and a smoke developed of 50 or less, friction-fitted to completely fill the stud cavities. See Batts and Blankets Category (BKNV) for names of manufacturers.

5F. **Fiber, Sprayed* —** (Optional, Not Shown — Not for use with Items 6, 6A, 6B, 6C, or 6D) — As an alternate to Batts and Blankets (Item 5) and Item 5A - Spray applied granulated mineral fiber material. The fiber is applied with adhesive, at a minimum density of 4.0 pcf, to completely fill the enclosed cavity in accordance with the application instructions supplied with the product. See **Fiber, Sprayed** (CCAZ).
AMERICAN ROCKWOOL MANUFACTURING, LLC — Type Rockwool Premium Plus

5G. **Fiber, Sprayed* —** (Optional, Not Shown — Not for use with Items 6, 6A, 6B, 6C, or 6D). — As an alternate to Batts and Blankets (Item 5) and Item 5A - Brown Colored Spray applied cellulose fiber. The fiber is applied with water to completely fill the enclosed stud cavity in accordance with the application instructions supplied with the product. The minimum dry density shall be 4.30 lbs/ft^3.
INTERNATIONAL CELLULOSE CORP — Celbar-RL

5H. **Foamed Plastic* —** (Optional -For use with Item 3R) — Spray applied, foamed plastic insulation, at any thickness from partial fill to completely filling stud cavity.
SES FOAM INC — Nexseal™ 2.0 or Nexseal™ 2.0 LE Spray Foam and Sucraseal Spray Foam.

5I. **Fiber, Sprayed* —** (Not Shown — Not for use with Item 6) — As an alternate to Batts and Blankets (Item 5) - Spray-applied cellulose material. The fiber is applied with water to completely fill the enclosed cavity in accordance with the application instructions supplied with the product. To facilitate the installation of the material, any thin, woven or non-woven netting may be attached by any means possible to the outer face the studs. The material shall reach equilibrium moisture content before the installation of materials on either face of the studs. The minimum dry density shall be 5.79 lbs/ft^3.
APPLEGATE HOLDINGS L L C — Applegate Advanced Stabilized Cellulose Insulation

5J. **Foamed Plastic* —** (Optional, Not Shown - For use with Item 3U) — Spray applied, foamed plastic insulation, at any thickness from partial fill to completely filling stud cavity.
GACO WESTERN L L C — Types GacoEZSpray F4500, GacoProFill FR6500R, Gaco 052N, GacoOnePass F1850, GacoOnePass Low GWP F1880, and Gaco WallFoam 183M

5K. **Foamed Plastic* —** (Optional, Not Shown - For use with Item 3V) — Spray applied, foamed plastic insulation, at any thickness from partial fill to completely filling stud cavity.
CARLISLE SPRAY FOAM INSULATION — Types SealTite Pro Closed Cell (CC), SealTite Pro Open Cell (OC), SealTite Pro OCX, SealTite Pro No Trim 21, SealTite Pro One Zero, Foamulate Closed Cell, Foamulate OCX, Foamulate 70, and Foamulate HFO.

6. **Steel Framing Members* —** (Optional, Not Shown) — Furring channels and Steel Framing Members as described below:
a. **Furring Channels —** Formed of No. 25 MSG galv steel. 2-9/16 in. or 2-23/32 in. wide by 7/8 in. deep, spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Ends of adjoining channels are overlapped 6 in. and tied together with double strand of No. 18 SWG galv steel wire near each end of overlap. As an alternate, ends of adjoining channels may be overlapped 6 in. and secured together with two self-tapping #6 framing screws, min. 7/16 in. long at the midpoint of the overlap, with one screw on each flange of the channel. Gypsum board attached to furring channels as described in Item 3.

b. **Steel Framing Members* —** Used to attach furring channels (Item 6a) to studs. Clips spaced 48 in. OC. RSIC-1 and RSIC-1 (2.75) clips secured to studs with No. 8 x 2-1/2 in. coarse drywall screw through the center grommet. RSIC-V and RSIC-V (2.75) clips secured to studs with No. 8 x 1-1/2 in. coarse drywall screw through the center hole. Furring channels are friction fitted into clips. RSIC-1 and RSIC-V clips for use with 2-9/16 in. wide furring channels. RSIC-1 (2.75) and RSIC-V (2.75) clips for use with 2-23/32 in. wide furring channels.
PAC INTERNATIONAL L L C — Types RSIC-1, RSIC-V, RSIC-1 (2.75), RSIC-V (2.75)

6A. **Steel Framing Members* —** (Optional, Not Shown) — Furring channels and Steel Framing Members on one side of studs as described below:
a. **Furring Channels —** Formed of No. 25 MSG galv steel, spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Ends of adjoining channels are overlapped 6 in. and tied together with double strand of No. 18 SWG galv steel wire near each end of overlap. Batts and Blankets placed in stud cavity as described in Item 5. Two layers of gypsum board attached to furring channels as described in Item 3.

b. **Steel Framing Members* —** Used to attach furring channels (Item 6Aa) to one side of studs only. Clips spaced 48 in. OC., and secured to studs with two No. 8 x 2-1/2 in. coarse drywall screws, one through the hole at each end of the clip. Furring channels are friction fitted into clips.
KINETICS NOISE CONTROL INC — Type Isomax

6B. **Steel Framing Members* —** (Optional, Not Shown) — Furring channels and Steel Framing Members as described below:
a. **Furring Channels —** Formed of No. 25 MSG galv steel. 2-3/8 in. wide by 7/8 in. deep, spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Ends of adjoining channels are overlapped 6 in. and tied together with double strand of No. 18 SWG galv steel wire near each end of overlap. As an alternate, ends of adjoining channels may be overlapped 6 in. and secured together with two self-tapping #6 framing screws, min. 7/16 in. long at the midpoint of the overlap, with one screw on each flange of the channel. Gypsum board attached to furring channels as described in Item 3.

b. **Steel Framing Members* —** Used to attach furring channels (Item 6Ba) to studs. Clips spaced 48 in. OC. Genie clips secured to studs with No. 8 x 1-1/2 in. coarse drywall screw through the center hole. Furring channels are friction fitted into clips.
PLITEQ INC — Type Genie Clip

6C. **Steel Framing Members* —** (Optional, Not Shown) — Furring channels and Steel Framing Members as described below:
a. **Furring Channels —** Formed of No. 25 MSG galv steel. Spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Ends of adjoining channels overlapped 6 in. and tied together with double strand of No. 18 AWG galvanized steel wire. Gypsum board attached to furring channels as described in Item 3.

b. **Steel Framing Members* —** Used to attach furring channels (Item 6Ca) to studs. Clips spaced 48 in. OC., and secured to studs with No. 2 in. coarse drywall screw with 1 in. diam washer through the center hole. Furring channels are friction fitted into clips.
STUDCO BUILDING SYSTEMS — RESILMOUNT Sound Isolation Clips - Type A237 or A237R

6D. **Steel Framing Members* —** (Optional, Not Shown) — Furring channels and Steel Framing Members as described below:
a. **Furring Channels —** Formed of No. 25 MSG galv steel, spaced 24 in. OC, and perpendicular to studs. Channels secured to studs as described in Item b. Ends of adjoining channels overlapped 6 in. and secured in place with a double strand of No. 18 AWG twisted steel wire. Gypsum board attached to furring channels as described in Item 3.

b. **Steel Framing Members* —** Used to attach furring channels (Item 6Da) to studs. Clips spaced 48 in. OC., and secured to studs with No. 8 x 2-1/2 in. coarse drywall screw through the center hole. Furring channels are friction fitted into clips.
REGUPOL AMERICA — Type SonusClip

6E. **Steel Framing Members* —** (Optional, Not Shown) — Resilient channels and Steel Framing Members as described below:
a. **Resilient Channels —** Formed of No. 25 MSG galv steel, spaced 24 in. OC, and perpendicular to studs. Channels secured to studs as described in Item b. Ends of adjoining channels overlapped 6 in. and secured in place with two No. 8 15 x 1/2 in. Philips Modified Truss screws spaced 2-1/2 in. from the center of the overlap. Gypsum board attached to resilient channels as described in Item 3.

b. **Steel Framing Members* —** Used to attach resilient channels (Item 6Ea) to studs. Clips spaced 48 in. OC., and secured to studs with No. 8 x 2-1/2 in. coarse drywall screw through the center hole. Resilient channels are secured to clips with one No. 10 x 1/2 in. pan-head self-drilling screw.
KEENE BUILDING PRODUCTS CO INC - Type RC+ Assurance Clip

6F. **Steel Framing Members* —** (Optional, Not Shown) — Furring channels and Steel Framing Members as described below:
a. **Furring Channels —** Formed of No. 25 MSG galv steel. 2-23/32 in. wide by 7/8 in. or 1-1/2 in. deep, spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Ends of adjoining channels are overlapped 6 in. and tied together with double strand of No. 18 SWG galv steel wire near each end of overlap. As an alternate, ends of adjoining channels may be overlapped 6 in. and secured together with two self-tapping #6 framing screws, min. 7/16 in. long at the midpoint of the overlap, with one screw on each flange of the channel. Gypsum board attached to furring channels as described in Item 3.

b. **Steel Framing Members* —** Used to attach furring channels (Item 6Fa) to studs. Clips spaced 48 in. OC. Clips secured to studs with No. 8 x 2-1/2 in. coarse drywall screw through the center grommet. Furring channels are friction fitted into clips.
CLARKDIETRICH BUILDING SYSTEMS — Type ClarkDietrich Sound Clip

6G. **Steel Framing Members* —** (Optional, Not Shown) — Used as an alternate method to attach resilient channels to wall studs. A resilient sound isolation accessory shall be used at each attachment point of the resilient channels and spaced max 16 in. O.C. Channel ends butted and centered under the structural members and attached with one accessory at each end. Additional accessories used to hold resilient channels that support the gypsum board end joints. The accessory envelops the mounting edge of the resilient channel. The accessory and resilient channel are fastened to the structural members with the screws supplied with the accessory and per the accessory manufacturer's installation instructions.

PAC INTERNATIONAL L L C — Type RC-1 Boost

7. **Furring Channel —** Optional — Not Shown — For use on one side of the wall - Resilient channels, 25 MSG galv steel, spaced vertically 24 in. OC, flange portion screw attached to one side of studs with 1-1/4 in. long diamond shaped point, double lead Phillips head steel screws. When resilient channels are used, insulation, Items 5C or 5D is required.

8. **Caulking and Sealants —** (Not Shown, Optional) — A bead of acoustical sealant applied around the partition perimeter for sound control.

9. **STC Rating —** The STC Rating of the wall assembly is 56 when it is constructed as described by Items 1 through 6, except:

A. Item 2, above — Nailheads Shall be covered with joint compound.

B. Item 2, above — Joints As described, shall be covered with fiber tape and joint compound.

C. Item 5, above — Batts and Blankets* The cavities formed by the studs shall be friction fit with R-19 unfaced fiberglass insulation batts measuring 6-1/4 in. thick and 15-1/4 in. wide.

D. Item 6, above — Steel Framing Members* Type RSIC-1 clips shall be used to attach gypsum board to studs on either side of the wall assembly.

E. Item 8, above — Caulking and Sealants (Not Shown) A bead of acoustical sealant shall be applied around the partition perimeter for sound control.

F. Steel Corner Fasteners (Item 4), Fiber, Sprayed (Items 5A and 5B) and Steel Framing Members (Item 6A), not evaluated as alternatives for obtaining STC rating.

10. **Wall and Partition Facings and Accessories* —** (Optional, Not Shown) — Nominal 1/2 in. thick, 4 ft wide panels, for optional use as an additional layer on one or both sides of the assembly. Panels attached in accordance with manufacturer's recommendations. When the QR-500 or QR-510 panel is installed between the wood framing and the UL Classified gypsum board, the required UL Classified gypsum board layer(s) is/are to be installed as indicated as to fastener type and spacing, except that the required fastener length shall be increased by a minimum of 1/2 in. Not evaluated or intended as a substitute for the required layer(s) of UL Classified Gypsum Board.
PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM — Type QuietRock QR-500 and QR-510

11. **Cementitious Backer Units* —** (Optional Item Not Shown — For Use On Face Of 1 Hr Systems With All Standard Items Required) - 7/16 in., 1/2 in., 5/8 in., 3/4 in. or 1 in. thick, min. 32 in. wide. Applied vertically or horizontally with vertical joints centered over studs. Fastened to studs and runners with cement board screws of adequate length to penetrate stud by a minimum of 3/8 in. for steel framing members, and a minimum of 3/4 in. for wood framing members spaced a max of 8 in. OC. When 4 ft. wide boards are used, horizontal joints need not be backed by framing.
NATIONAL GYPSUM CO — Type DuraBacker, PermaBase, DuraBacker Plus, or PermaBase Plus

12. **Non-Bearing Wall Partition Intersection —** (Optional) —Two nominal 2 by 4 in. studs or nominal 2 by 6 in. studs nailed together with two 3 in. long 10d nails spaced a max. 16 in. OC. vertically and fastened to one side of the minimum 2 by 4 in. stud with 3 in. long 10d nails spaced a max. 16 in. OC. vertically. Intersection between partition wood studs to be flush with the 2 by 4 in. studs. The wall partition wood studs are to be framed by with a second 2 by 4 in. wood stud fastened with 3 in. long 10d nails spaced a max. 16 in. OC. vertically. Maximum one non-bearing wall partition intersection per stud cavity. Non-bearing wall partition stud depth shall be at a minimum equal to the depth of the bearing wall.

13. **Mesh Netting —** (Not Shown) — Any thin, woven or non-woven fibrous netting material attached with staples to the outer face of one row of studs to facilitate the installation of the sprayed fiber from the opposite row.

14. **Mineral and Fiber Board* —** (Optional, Not Shown) — For optional use as an additional layer on one side of wall. Nom 1/2 in. thick, 4 ft wide with long dimension parallel and centered over studs. Attached to framing with minimum 1-3/8 in. long ring shanked nails or 1-1/4 in. long Type W steel screws, spaced 12 in. OC. Gypsum board installed with the long dimension parallel and centered over the UL Classified Gypsum Board (Item 3). Fiber boards installed with 1-1/4 in. long, Type W, bugle head, coarse thread gypsum board screws spaced 12 in. OC max, with the last screws spaced 2 in. and 6 in. from edge of board. Gypsum board (Item 3) installed as indicated as to fastener type and spacing, except that the required fastener length shall be increased by a minimum of 1/2 in. Not evaluated or intended as a substitute for the required layer(s) of UL Classified Gypsum Board.
HOMASOTE CO — Homasote Type 440-32

14A. **Mineral and Fiber Board* —** (Optional, Not Shown) — For use with Items 14B-14E) — For optional use as an additional layer on one side of wall. Nom 1/2 in. thick, 4 ft wide with long dimension parallel and centered over studs. Attached to framing with minimum 1-3/8 in. long ring shanked nails or 1-1/4 in. long Type W steel screws, spaced 12 in. OC along board edges and 24 in. OC in field of board along intermediate framing. Not evaluated or intended as a substitute for the required layer(s) of UL Classified Gypsum Board.
HOMASOTE CO — Homasote Type 440-32

14B. **Glass Fiber Insulation —** (For use with Item 14A) — 3-1/2 in. thick glass fiber batts bearing the UL Classification Marking as to Surface Burning and/or Fire Resistance, placed to fill the interior of the wall. See Batts and Blankets (BKNV or BZJZ) categories for names of Classified companies.

14C. **Batts and Blankets* —** (As an alternate to Item 14B, For use with Item 14A), 3 in. thick mineral wool batts, placed to fill interior of wall, attached to the 3-1/2 in. face of the studs with staples placed 24 in. OC.
THERMAFIBER INC — Type SAFB, SAFB FF

14D. **Adhesive —** (For use with Item 14A) — Construction grade adhesive applied in vertical, serpentine, nominal 3/8 in. wide beads down the length of both vertical edges of Mineral and Fiber Board (Item 14A).

14E. **Gypsum Board* —** (For use with Item 14A) — 5/8 in. thick, 4 ft wide, applied vertically over Mineral and Fiber Board (Item 14A) with vertical joints located anywhere over stud cavities. Secured to mineral and fiber boards with 1-1/2 in. Type G Screws spaced 8 in. OC along edges of each vertical joint and 12 in. OC in intermediate field of the Mineral and Fiber Board (Item 14A). Secured to outermost studs and bearing plates with 2 in. long Type S screws spaced 8 in. OC. Gypsum Board joints covered with paper tape and joint compound. Screw heads covered with joint compound. Finish Rating 30 Min.
AMERICAN GYPSUM CO — Type AG-C

CERTAINTEED GYPSUM INC — Type C

CGC INC — Types C, IP-X2, IPC-AR

CERTAINTEED GYPSUM INC — Type LGFC-C/A

GEORGIA-PACIFIC GYPSUM L L C — Types 5, DAPC, TG-C

NATIONAL GYPSUM CO — Types FSK-C, FSW-C

PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM — Type PG-C

PANEL REY S A — Type PRC

THAI GYPSUM PRODUCTS PCL — Type C

UNITED STATES GYPSUM CO — Types C, IP-X2, IPC-AR

USG BORAL DRYWALL SFZ LLC — Type C

USG MEXICO S A DE C V — Types C, IP-X2, IPC-AR

14F. **Mineral and Fiber Board —** (Optional, Not Shown) — For optional use as an additional layer on one side of wall - Nom 1/2 in. thick, 4 ft wide, square edge fiber boards applied vertically to studs on one side of the wall in between the wood studs and the UL Classified Gypsum Board (Item 3). Fiber boards installed with 1-1/4 in. long, Type W, bugle head, coarse thread gypsum board screws spaced 12 in. OC max, with the last screws spaced 2 in. and 6 in. from edge of board. Gypsum board (Item 3) installed as indicated as to fastener type and spacing, except that the required fastener length shall be increased by a minimum of 1/2 in. Not evaluated or intended as a substitute for the required layer(s) of UL Classified Gypsum Board.
BLUE RIDGE FIBERBOARD INC — SoundStop

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

Last Updated on 2021-07-29

The appearance of a company's name or product in this database does not in itself assure that products so identified have been manufactured under UL's Follow-Up Service. Only those products bearing the UL Mark should be considered to be Certified and covered under UL's Follow-Up Service. Always look for the Mark on the product.

UL permits the reproduction of the material contained in the Online Certification Directory subject to the following conditions: 1. The Guide Information, Assemblies, Constructions, Designs, Systems, and/or Certifications (files) must be presented in their entirety and in a non-misleading manner, without any manipulation of the data (or drawings). 2. The statement "Reprinted from the Online Certifications Directory with permission from UL" must appear adjacent to the extracted material. In addition, the reprinted material must include a copyright notice in the following format: "© 2021 UL LLC"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

0" 1" THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

UL U305 (CONT'D)

AG012

PLOT DATE: 3/28/2022 3:02:56 PM

COPYRIGHT©

UL Product iQ™

BXUV.U309

Design/System/Construction/Assembly Usage Disclaimer

- Authorities Having Jurisdiction should be consulted in all cases as to the particular requirements covering the installation and use of UL Certified products, equipment, system, devices, and materials.
- Authorities Having Jurisdiction should be consulted before construction.
- Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with applicable requirements. The published information cannot always address every construction nuance encountered in the field.
- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.
- Only products which bear UL's Mark are considered Certified.

BXUV - Fire Resistance Ratings - ANSI/UL 263 Certified for United States
BXUV7 - Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada

See General Information for Fire-resistance Ratings - ANSI/UL 263 Certified for United States
Design Criteria and Allowable Variances

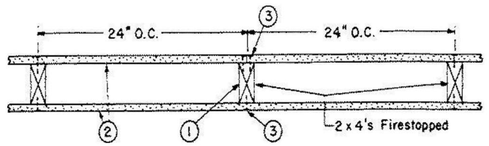
See General Information for Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada
Design Criteria and Allowable Variances

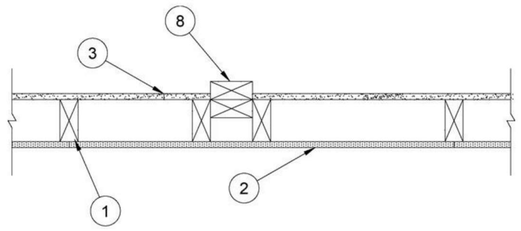
Design No. U309

July 29, 2021

Bearing Wall Rating — 1 Hr.
Finish Rating — See Items 2, 2A and 2B
This design was evaluated using a load design method other than the Limit States Design Method (e.g., Working Stress Design Method). For jurisdictions employing the Limit States Design Method, such as Canada, a load restriction factor shall be used — See Guide BXUV or BXUV7

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**





1. **Wood Studs —** Nom 2 by 4 in., spaced 24 in. OC effectively firestopped.

2. **Gypsum Board* —** 5/8 in. thick, 4 ft wide, applied either horizontally or vertically, nailed to studs and bearing plates with 6d cement coated nails min. 1-7/8 in. long, 0.0915 in. shank diam and 1/4 in. diam heads spaced 7 in. OC. Finish Rating 27 Min. When used in widths other than 48 in., gypsum board to be installed horizontally.

When **Steel Framing Members*** (Items 5 or any alternate clips) are used, wallboard attached to furring channels with 1 in. long Type S bugle-head steel screws spaced 12 in. OC.

When Item 6, resilient channels are used, 5/8 in. thick, 4 ft wide applied vertically. Screw attached furring channels with 1 in. long, self-drilling, self-tapping Type S or S-12 steel screws spaced 8 in. OC, vertical joints located midway between studs.

AMERICAN GYPSUM CO — Types AGX-1, M-Glass, AG-C, LightRoc

BEIJING NEW BUILDING MATERIALS PUBLIC LTD CO — Type DBX-1

CABOT MANUFACTURING ULC — Type X, 5/8 Type X, Type Blueglass Exterior Sheathing

CERTAINTEED GYPSUM INC — Type X, Type X-1, Types EGRG, GlasRoc, GlasRoc-2, Type C

CERTAINTEED GYPSUM INC — Types LGFC6A, LGFC2A, LGFC-C/A, LGCF-WD, LGLLX, CLLX

GEORGIA-PACIFIC GYPSUM L L C — Types 5, 6, 9, C, DAP, DD, DA, DAPC, DGG, DS, GPFS6, LS (finish rating 23 min), Type X, Veneer Plaster Base - Type X, Water Rated - Type X, Sheathing - Type X, Soffit - Type X, TG-C, Type LWX, Veneer Plaster Base-Type LWX, Water Rated-Type LWX, Sheathing Type-LWX, Soffit-Type LWX, Type DGLW, Water Rated-Type DGLW, Sheathing Type- DGLW, Soffit-Type DGLW, Type LW2X, Veneer Plaster Base - Type LW2X, Water Rated - Type LW2X, Sheathing - Type LW2X, Soffit - Type LW2X, Type DGL2W, Water Rated - Type DGL2W, Sheathing - Type DGL2W

NATIONAL GYPSUM CO — Types -eXP-C, FSK, FSK-C, FSW, FSW-3, FSW-5, FSW-C, FSW-G, FSMR-C, FSW-6 (finish rating 20 min), FSL, FSW-8, RSX

PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM — Type C, PG-9, PG-11, PG-C, PGS-WRS, PGI

PANEL REY S A — Types GREX, GRIX, PRC, PRC2, PRX, RHX, MDX, ETX

SIAM GYPSUM INDUSTRY (SARABURI) CO LTD — Type EX-1

THAI GYPSUM PRODUCTS PCL — Type X, Type C

2A. **Gypsum Board* —** (As an alternate to Item 2, Not Shown) — Nominal 5/8 in. thick, 4 ft wide panels, applied vertically to studs and bearing plates on one side of the assembly with 1-5/8 in. long Type S screws spaced 12 in. OC at perimeter of panels and 8 in. OC in the field. Horizontal joints of vertically applied panels need not be backed by studs. Panel joints covered with paper tape and two layers of joint compound. Screwheads covered with two layers of joint compound. Batts and Blankets placed in stud cavity as described in Item 4E. Not evaluated for use with Steel Framing Members, Furring Channels or Fiber, Sprayed.
PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM — Type QuietRock 530 (finish rating 23 min)

2B. **Gypsum Board* —** (As an alternate to Item 2) — 5/8 in. thick gypsum panels, with square edges, applied either horizontally or vertically. Gypsum panels fastened to framing with 1-1/4 in. long Type W coarse thread gypsum panel steel screws spaced a max 8 in. OC, with last two screws 1 and 4 in. from edge of board or nailed to studs and bearing plates with 6d cement coated nails 1-7/8 in. long, 0.0915 in. shank diam and 1/4 in. diam heads spaced 7 in. OC. When used in widths of other than 48 in., gypsum boards are to be installed horizontally.
GEORGIA-PACIFIC GYPSUM L L C — Type DGG, GreenGlass Type X (finish rating 23 min).

2C. **Gypsum Board* —** (As an alternate to Item 2) — 5/8 in. thick, 4 ft. wide, paper surfaced applied vertically only and secured as described in Item 2.
GEORGIA-PACIFIC GYPSUM L L C — Type X ComfortGuard Sound Deadening Gypsum Board (finish rating 27 min)

NATIONAL GYPSUM CO — Type SBWB

2D. **Gypsum Board* —** (As an alternate to Items 2 through 2C) — Nominal 5/8 in. thick, 4 ft wide panels, applied vertically and secured as described in Item 2.

PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM — Type QuietRock ES

2E. **Gypsum Board* —** (As an alternate to Item 2) — 5/8 in. thick, 4 ft. wide, paper surfaced applied vertically or horizontally and secured as described in Item 2 or 2K.
CERTAINTEED GYPSUM INC — Type SilentFX

2F. **Gypsum Board* —** (As an alternate to 5/8 in. Type FSW in Item 2) — 2 layers nom. 5/16 in. thick gypsum panels applied vertically or horizontally. Horizontal joints on the same side need not be staggered. Inner layer attached with fasteners, as described in item 2, spaced 24 in. OC. Outer layer attached per Item 2.
NATIONAL GYPSUM CO — Type FSW

2G. **Gypsum Board* —** (As an alternate to Item 2) — 5/8 in. thick, 4 ft. wide, applied vertically or horizontally with vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Secured as described in Item 2 or 2K.
CERTAINTEED GYPSUM INC — 5/8" Easi-Lite Type X

THAI GYPSUM PRODUCTS PCL — 5/8" Easi-Lite Type X

2H. **Wall and Partition Facings and Accessories* —** (As an alternate to Item 2) — Nominal 5/8 in. thick, 4 ft wide panels, applied vertically and secured as described in Item 2.
PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM — Type QuietRock 527.

2I. **Gypsum Board* —** (As an alternate to Item 2) — 5/8 in. thick gypsum panels, with beveled, square, or tapered edges, applied either horizontally or vertically. Gypsum panels fastened to framing with 1-1/4 in. long Type W coarse thread gypsum panel steel screws spaced a maximum 10 in. OC with the last two screws 4 and 1 in. from the edges of the board. When used in widths other than 48 in., gypsum panels are to be installed horizontally.
CERTAINTEED GYPSUM INC — Type LGFC6A (finish rating 21 min), Type LGFC2A, Type LGFC-C/A, Type LGFC-WD, Type LGLLX

2J. **Gypsum Board* —** (As an alternate to Item 2) — 5/8 in. thick gypsum panels, with beveled, square, or tapered edges, applied either horizontally or vertically. Gypsum panels fastened to framing as described in Item 2 or with 1-1/4 in. long Type W coarse thread gypsum panel steel screws spaced a max 8 in. OC, with last screw 1 in. from edge of board. When used in widths of other than 48 in., gypsum boards are to be installed horizontally. When square edge boards are used joint treatment, Item 3, may be omitted.
AMERICAN GYPSUM CO — Types AGX-1, M-Glass, AG-C

NATIONAL GYPSUM CO — Type FSK, Type FSK-G, Type FSW, Type FSW-3, Type FSW-5, Type FSW-G, Type FSK-C, Type FSW-C, Type FSMR-C, Type FSW-6, Type FSL

2K. **Gypsum Board* —** (As an alternate to Item 2) — 5/8 in. thick gypsum panels, with beveled, square, or tapered edges, applied either horizontally or vertically. Gypsum panels fastened to framing with 1-1/4 in. long Type W coarse thread gypsum panel steel screws spaced a max 8 in. OC, with last screw 1/2 in. from edge of board. When used in widths of other than 48 in., gypsum boards are to be installed horizontally.
CERTAINTEED GYPSUM INC — Type X, Type X-1, Types EGRG, GlasRoc, GlasRoc-2, Type C

3. **Joints and Fastener Heads —** Wallboard joints covered with paper tape and joint compound. Fastener heads covered with joint compound. Gypsum plaster not more than 1/8 in. thick may be applied over the wallboard in addition to the specified joint treatment.

4. **Batts and Blankets* —** (Not Shown) — Optional glass fiber insulation.
CERTAINTEED CORP

JOHNS MANVILLE

OWENS CORNING

4A. **Fiber, Sprayed* —** As an alternate to Batts and Blankets (Item 4) — Spray applied cellulose material. The fiber is applied with water to completely fill the enclosed cavity in accordance with the application instructions supplied with the product with a nominal dry density of 2.7 lb/ft^3. Alternate Application Method: The fiber is applied without water or adhesive at a nominal dry density of 3.5 lb/ft^3, in accordance with the application instructions supplied with the product. When Item 5 is used, Fiber, Sprayed shall be INS735, INS745, INS750LD, INS765LD, INS773LD or SANCTUARY.

U S GREENFIBER L L C — INS735, INS745, INS750LD and SANCTUARY for use with wet or dry application. INSS15LD, INSS41LD, INS735, INS745, INS765LD, and INS773LD are to be used for dry application only

4B. **Fiber, Sprayed* —** As an alternate to Batts and Blankets (Item 4) — Spray applied cellulose insulation material. The fiber is applied with water to interior surfaces in accordance with the application instructions supplied with the product. Applied to completely fill the enclosed cavity. Minimum dry density of 4.3 pounds per cubic ft.
NU-WOOL CO INC — Cellulose Insulation

4C. **Batts and Blankets* —** Required for use with resilient channels, Item 6, 3 in. thick mineral wool batts, placed to fill interior of wall, attached to the 4 in. face of the studs with staples placed 24 in. OC.
ROCKWOOL — Type SAFEnSOUND

THERMAFIBER INC — Type SAFB, SAFB FF

4D. **Glass Fiber Insulation —** (As an alternate to Item 4C) — 3 in. thick glass fiber batts bearing the UL Classification Marking as to Surface Burning and/or Fire Resistance, placed to fill the interior of the wall, attached to the 4 in. face of the studs with staples placed 24 in. OC. See **Batts and Blankets** (BKNV or BZJZ) Catagories for names of Classified companies.

4E. **Batts and Blankets* —** (Required for use with Wall and Partition Facings and Accessories, Item 2A) — Glass fiber insulation, nom 3-1/2 in. thick, min. density of 0.80 pcf, with a flame spread of 25 or less and a smoke developed of 50 or less, friction-fitted to completely fill the stud cavities. See Batts and Blankets Category (BKNV) for names of manufacturers.

4F. **Fiber, Sprayed* —** As an alternate to Batts and Blankets (Item 4) — Spray applied cellulose fiber. The fiber is applied with water to completely fill the enclosed cavity in accordance with the application instructions supplied with the product. The minimum dry density shall be 4.30 lbs/ft^3.
INTERNATIONAL CELLULOSE CORP — Celbar-RL

4G. **Fiber, Sprayed* —** As an alternate to Batts and Blankets (Item 4) — Spray-applied cellulose material. The fiber is applied with water to completely fill the enclosed cavity in accordance with the application instructions supplied with the product. To facilitate the installation of the material, any thin, woven or non-woven netting may be attached by any means possible to the outer face the studs. The material shall reach equilibrium moisture content before the installation of materials on either face of the studs. The minimum dry density shall be 5.79 lbs/ft^3.
APPLEGATE HOLDINGS L L C — Applegate Advanced Stabilized Cellulose Insulation

5. **Steel Framing Members* —** (Optional, Not Shown) — Furring channels and Steel Framing Members as described below:
a. **Furring Channels —** Formed of No. 25 MSG galv steel. 2-9/16 in. or 2-23/32 in. wide by 7/8 in. deep, spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Ends of adjoining channels are overlapped 6 in. and tied together with double strand of No. 18 SWG galv steel wire near each end of overlap. As an alternate, ends of adjoining channels may be overlapped 6 in. and secured together with two self-tapping #6 framing screws, min. 7/16 in. long at the midpoint of the overlap, with one screw on each flange of the channel. Wallboard attached to furring channels as described in Item 2.

b. **Steel Framing Members* —** Used to attach furring channels (Item a) to studs (Item 1). Clips spaced 48 in. OC,, and secured to studs with No. 8 x 2-1/2 in. coarse drywall screw through the center grommet. Furring channels are friction fitted into clips. RSIC-1 clip for use with 3-9/16 in. wide furring channels. RSIC-1 (2.75) clip for use with 2-23/32 in. wide furring channels.
PAC INTERNATIONAL L L C — Types RSIC-1, RSIC-1 (2.75)

5A. **Steel Framing Members* —** (Optional, Not Shown, As an alternate to Item 5) — Furring channels and Steel Framing Members as described below:
a. **Furring Channels —** Formed of No. 25 MSG galv steel. 2-3/8 in. wide by 7/8 in. deep, spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Ends of adjoining channels are overlapped 6 in. and tied together with double strand of No. 18 SWG galv steel wire near each end of overlap. As an alternate, ends of adjoining channels may be overlapped 6 in. and secured together with two self-tapping #6 framing screws, min. 7/16 in. long at the midpoint of the overlap, with one screw on each flange of the channel. Gypsum board attached to furring channels as described in Item 2.

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

0" 1" THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

UL U309

AG013

PLOT DATE: 3/28/2022 3:02:58 PM

COPYRIGHT©

b. **Steel Framing Members* —** Used to attach furring channels (Item a) to studs. Clips spaced 48 in. OC. Genie clips secured to studs with No. 8 x 1-1/2 in. coarse drywall screw through the center hole. Furring channels are friction fitted into clips.
PLITEQ INC — Type Genie Clip

5B. **Steel Framing Members* —** (Optional, Not Shown, As an alternate to Item 5) — Furring channels and Steel Framing Members as described below:
a. **Furring Channels —** Formed of No. 25 MSG galv steel. Spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Ends of adjoining channels overlapped 6 in. and tied together with double strand of No. 18 AWG galvanized steel wire. Gypsum board attached to furring channels as described in Item 2.

b. **Steel Framing Members* —** Used to attach furring channels (Item 5Ba) to studs. Clips spaced 48 in. OC., and secured to studs with 2 in. coarse drywall screw with 1 in. diam washer through the center hole. Furring channels are friction fitted into clips.
STUDCO BUILDING SYSTEMS — RESILMOUNT Sound Isolation Clips - Type A237R

5C. **Steel Framing Members* —** (Optional, Not Shown, As an alternate to Item 5) — Furring channels and Steel Framing Members as described below:
a. **Furring Channels —** Formed of No. 25 MSG galv steel. Spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item 5Cb. Ends of adjoining channels overlapped 6 in. and tied together with double strand of No. 18 AWG galvanized steel wire. Gypsum board attached to furring channels as described in Item 3.

b. **Steel Framing Members* —** Used to attach furring channels (Item 5Ca) to studs. Clips spaced 48 in. OC, and secured to studs with No. 8 × 2-1/2 in. coarse drywall screw through the center hole. Furring channels are friction fitted into clips.
REGUPOL AMERICA — Type SonusClip

5D. **Steel Framing Members* —** (Optional, Not Shown, As an alternate to Item 5) — Resilient channels and Steel Framing Members as described below:
a. **Resilient Channels —** Formed of No. 25 MSG galv steel, spaced 24 in. OC, and perpendicular to studs. Channels secured to studs as described in Item b. Ends of adjoining channels overlapped 6 in. and secured in place with two No. 8 15 x 1/2 in. Philips Modified Truss screws spaced 2-1/2 in. from the center of the overlap. Gypsum board attached to resilient channels as described in Item 3.

b. **Steel Framing Members* —** Used to attach resilient channels (Item 5Da) to studs. Clips spaced 48 in. OC., and secured to studs with No. 8 x 2-1/2 in. coarse drywall screw through the center hole. Resilient channels are secured to clips with one No. 10 x 1/2 in. pan-head self-drilling screw.
KEENE BUILDING PRODUCTS CO INC — Type RC+ Assurance Clip

5E. **Steel Framing Members* —** (Optional, Not Shown, As an alternate to Item 5) — Used as an alternate method to attach resilient channels to wall studs. A resilient sound isolation accessory shall be used at each attachment point of the resilient channels and spaced max 24 in. O.C. Channel ends butted and centered under the structural members and attached with one accessory at each end. Additional accessories used to hold resilient channels that support the gypsum board end joints. The accessory envelops the mounting edge of the resilient channel. The accessory and resilient channel are fastened to the structural members with the screws supplied with the accessory and per the accessory manufacturer's installation instructions.
PAC INTERNATIONAL L L C — Type RC-1 Boost

5F **Steel Framing Members* —** (Optional, Not Shown, As an alternate to Item 5) — Furring channels and Steel Framing Members as described below:
a **Furring Channels —** Formed of No. 25 MSG galv steel. 2-23/32 in. wide by 7/8 in. or 1-1/2 in. deep, spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Ends of adjoining channels are overlapped 6 in. and tied together with double strand of No. 18 SWG galv steel wire near each end of overlap. As an alternate, ends of adjoining channels may be overlapped 6 in. and secured together with two self-tapping #6 framing screws, min. 7/16 in. long at the midpoint of the overlap, with one screw on each flange of the channel. Gypsum board attached to furring channels as described in Item 3.

b **Steel Framing Members* —** Used to attach furring channels (Item 5Fa) to studs. Clips spaced maximum 48 in. OC. Clips secured to studs with No. 8 x 2-1/2 in. coarse drywall screw through the center grommet. Furring channels are friction fitted into clips.

CLARKDIETRICH BUILDING SYSTEMS — Type ClarkDietrich Sound Clip

6. **Furring Channel —** Optional — Not Shown — For use on one side of the wall - Resilient channels, 25 MSG galv steel, spaced vertically 24 in. OC, flange portion screw attached to one side of studs with 1-1/4 in. long diamond shaped point, double lead Phillips head steel screws. When resilient channels are used, insulation, Items 4C or 4D is required.

7. **Wall and Partition Facings and Accessories* —** (Optional, Not Shown) — Nominal 1/2 in. thick, 4 ft wide panels, for optional use as an additional layer on one or both sides of the assembly. Panels attached in accordance with manufacturer's recommendations. When the QR-500 or QR-510 panel is installed between the wood framing and the UL Classified gypsum board, the required UL Classified gypsum board layer(s) is/are to be installed as indicated as to fastener type and spacing, except that the required fastener length shall be increased by a minimum of 1/2 in. Not evaluated or intended as a substitute for the required layer(s) of UL Classified Gypsum Board.
PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM — Type QuietRock QR-500 and QR-510

8. **Non-Bearing Wall Partition Intersection —** (Optional) — Two nominal 2 by 4 in. stud or nominal 2 by 6 in. stud nailed together with two 3in. long 10d nails spaced a max. 16 in. OC. vertically and fastened to one side of the minimum 2 by 4 in. stud with 3 in. long 10d nails spaced a max 16 in. OC. vertically. Intersection between partition wood studs to be flush with the 2 by 4 in. studs. The wall partition wood studs are to be framed by with a second 2 by 4 in. wood stud fastened with 3 in. long 10d nails spaced a max. 16 in. OC. vertically. Maximum one non-bearing wall partition intersection per stud cavity. Non-bearing wall partition stud depth shall be at a minimum equal to the depth of the bearing wall.

9. **Mineral and Fiber Board* —** (Optional, Not Shown) — For optional use as an additional layer on one side of wall. Nom 1/2 in. thick, 4 ft wide with long dimension parallel and centered over studs. Attached to framing with 2 in. long Type W steel screws, spaced 12 in. OC. The required UL Classified gypsum board layer(s) is/are to be installed as indicated as to fastener type and spacing, except that the required fastener length shall be increased by a minimum of 1/2 in. Not evaluated or intended as a substitute for the required layer(s) of UL Classified Gypsum Board.
HOMASOTE CO — Homasote Type 440-32

9A. **Mineral and Fiber Board* —** (Optional, Not Shown) — For use with Items 9B-9E) — For optional use as an additional layer on one side of wall. Nom 1/2 in. thick, 4 ft wide with long dimension parallel and centered over studs. Attached to framing with minimum 1-3/8 in. long ring shanked nails or 1-1/4 in. long Type W steel screws, spaced 12 in. OC along board edges and 24 in. OC in field of board along intermediate framing. Not evaluated or intended as a substitute for the required layer(s) of UL Classified Gypsum Board.
HOMASOTE CO — Homasote Type 440-32

9B. **Glass Fiber Insulation —** (For use with Item 9A) — 3-1/2 in. thick glass fiber batts bearing the UL Classification Marking as to Surface Burning and/or Fire Resistance, placed to fill the interior of the wall. See Batts and Blankets (BKNV or BZJZ) categories for names of Classified companies.

9C. **Batts and Blankets* —** (As an alternate to Item 9B, For use with Item 9A), 3 in. thick mineral wool batts, placed to fill interior of wall, attached to the 3-1/2 in. face of the studs with staples placed 24 in. OC.
ROCKWOOL — Type SAFEnSOUND

THERMAFIBER INC — Type SAFB, SAFB FF

9D. **Adhesive —** (For use with Item 9A) — Construction grade adhesive applied in vertical, serpentine, nominal 3/8 in. wide beads down the length of both vertical edges of Mineral and Fiber Board (Item 9A).

9E. **Gypsum Board* —** (For use with Item 9A) — 5/8 in. thick, 4 ft wide, applied vertically over Mineral and Fiber Board (Item 9A) with vertical joints located anywhere over stud cavities. Secured to mineral and fiber boards with 1-1/2 in. Type G Screws spaced 8 in. OC along edges of each vertical joint and 12 in. OC in intermediate field of the Mineral and Fiber Board (Item 9A). Secured to outermost studs and bearing plates with 2 in. long Type S screws spaced 8 in. OC. Gypsum Board joints covered with paper tape and joint compound. Screw heads covered with joint compound. Finish Rating 30 Min.
AMERICAN GYPSUM CO — Type AG-C

CERTAINTEED GYPSUM INC — Type FRPC, Type C

CGC INC — Types C, IP-X2, IPC-AR

CERTAINTEED GYPSUM INC — Type LGFC-C/A

GEORGIA-PACIFIC GYPSUM L L C — Types 5, DAPC, TG-C

NATIONAL GYPSUM CO — Types FSK-C, FSW-C

PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM — Type PG-C.

PANEL REY S A — Types PRC, PRC2

THAI GYPSUM PRODUCTS PCL — Type C

UNITED STATES GYPSUM CO — Types C, IP-X2, IPC-AR

USG MEXICO S A DE C V — Types C, IP-X2, IPC-AR

9F. **Mineral and Fiber Board —** (Optional, Not Shown) — For optional use as an additional layer on one side of wall - Nom 1/2 in. thick, 4 ft wide, square edge fiber boards applied vertically to studs on one side of the wall in between the wood studs and the UL Classified Gypsum Board (Item 2). Fiber boards installed with 1-1/4 in. long, Type W, bugle head, coarse thread gypsum board screws spaced 12 in. OC max, with the last screws spaced 2 in. and 6 in. from edge of board. Gypsum board (Item 2) installed as indicated as to fastener type and spacing, except that the required fastener length shall be increased by a minimum of 1/2 in. Not evaluated or intended as a substitute for the required layer(s) of UL Classified Gypsum Board.
BLUE RIDGE FIBERBOARD INC — SoundStop

10. **Wall and Partition Facings and Accessories* —** (CLBV) (Optional, Not Shown) — For use with Item 1, Item 2, Item 3, Items 4, and Item 6. For maximum fire rating of 1 hour. On one side of the wall, over the first layer of Gypsum Board (Item 2), install RefleXor membrane with the gold side facing outwards. Membrane installed with T50 staples spaced 12 inches on center in both directions as per manufacturer's instructions, seams in membrane to be overlapped by 2 inches. When RefleXor membrane is used an additional layer of Gypsum Board that is identical to the first layer and as specified in Item 2 shall be installed over the membrane. Additional layer of Gypsum Board to be installed through the membrane to the stud as specified in Item 2 except the fastener length shall be increased by a minimum of 5/8 inch. Install Batts and Blankets in the stud cavity as per Item 4.

On the other side of the wall prior to the installation of the Gypsum Board install Resilient Channels as per Item 6. Over the Resilient Channel install 3/4 inch thick SONOpan panel secured to the Resilient Channel with min. 1-1/4 in. long drywall screws and washers spaced at 16 in. OC on the perimeter of the panel and 8 in. OC in the field of the panel. Over the SONOpan panel install the same Gypsum Board as specified in Item 2 with the fastener length increased by minimum 3/4 inch. Not evaluated or intended as a substitute for the required layer(s) of UL Classified Gypsum Board.

Alternately, on the other side of the wall prior to the installation of the Gypsum Board (Item 2), install 3/4 in. thick SONOpan panels, secured to one side of studs either horizontally or vertically. Panels secured to each stud with min. 1-1/4 in. long drywall screws spaced 12 in. OC. Over the SONOpan, install 25 MSG galv. steel, Resilient Channels, spaced vertically 24 in. OC. Resilient Channels fastened through panels to each stud with min. 2 in. long drywall screws or self-tapping screws. Over the Resilient Channels install Gypsum Board as specified in Item 2 with drywall screws as specified in Item 2. Panels not evaluated or intended as a substitute for the required layer(s) of UL Classified Gypsum Board.

MSL — RefleXor membrane, SONOpan panel

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

Last Updated on 2021-07-29

The appearance of a company's name or product in this database does not in itself assure that products so identified have been manufactured under UL's Follow-Up Service. Only those products bearing the UL Mark should be considered to be Certified and covered under UL's Follow-Up Service. Always look for the Mark on the product.

UL permits the reproduction of the material contained in the Online Certification Directory subject to the following conditions: 1. The Guide Information, Assemblies, Constructions, Designs, Systems, and/or Certifications (files) must be presented in their entirety and in a non-misleading manner, without any manipulation of the data (or drawings). 2. The statement "Reprinted from the Online Certifications Directory with permission from UL" must appear adjacent to the extracted material. In addition, the reprinted material must include a copyright notice in the following format: "© 2021 UL LLC"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

UL U309 (CONT'D)

AG014

COPYRIGHT©

PLOT DATE: 3/28/2022 3:02:58 PM

UL Product iQ™

BXUV.U337 - Fire-resistance Ratings - ANSI/UL 263

Design/System/Construction/Assembly Usage Disclaimer

- Authorities Having Jurisdiction should be consulted in all cases as to the particular requirements covering the installation and use of UL Certified products, equipment, system, devices, and materials.
- Authorities Having Jurisdiction should be consulted before construction.
- Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with applicable requirements. The published information cannot always address every construction nuance encountered in the field.
- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.
- Only products which bear UL's Mark are considered Certified.

BXUV - Fire Resistance Ratings - ANSI/UL 263 Certified for United States

BXUV7 - Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada

See General Information for Fire-resistance Ratings - ANSI/UL 263 Certified for United States
Design Criteria and Allowable Variances

See General Information for Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada
Design Criteria and Allowable Variances

Design No. U337

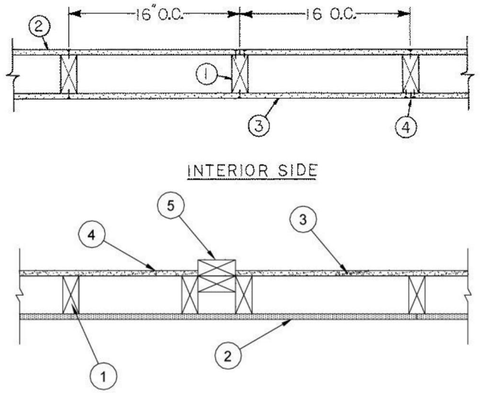
October 07, 2020

Bearing Wall Rating — 1 HR.

Finish Rating — See Item 2

This design was evaluated using a load design method other than the Limit States Design Method (e.g., Working Stress Design Method). For jurisdictions employing the Limit States Design Method, such as Canada, a load restriction factor shall be used — See Guide BXUV or BXUV7

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**



1. **Wood Studs —** Nominal 2 by 4 in. spaced 16 in. on center, effectively cross braced at mid-height and fire stopped at top and bottom.

2. **Gypsum Board* —** 5/8 in. thick, 4 ft wide, applied vertically. Gypsum board attached to studs and bearing plates with 1-3/4 in. long galv nails with 0.128 in. diam shank and 7/16 in. diam head, spaced 8 in. on center.
GEORGIA-PACIFIC GYPSUM L L C — Type DGG (finish rating 20 min), Type DAP, DAPC , DD, DS.

3. **Gypsum Board* —** 5/8 in. thick, 4 ft wide, applied vertically. Gypsum board attached to studs and bearing plates with 1-3/4 in. long galv nails with 0.128 in. diam shank and 7/16 in. diam head, spaced 8 in. on center.
AMERICAN GYPSUM CO — Types AGX-1 (finish rating 23 min.), M-Glass (finish rating 23 min.), AG-C, LightRoc (finish rating 23 min.).

BEIJING NEW BUILDING MATERIALS PUBLIC LTD CO — Type DBX-1 (finish rating 24 min).

CABOT MANUFACTURING ULC — Type X, 5/8 Type X, Type Blueglass Exterior Sheathing

CERTAINTEED GYPSUM INC — Type EGRG or GlasRoc (finish rating 23 min), GlasRoc-2, Type SilentFX (finish rating 24 min), Type X-1.

CERTAINTEED GYPSUM INC — Type LGFC2A, Type LGFC6A (finish rating 34 min), Type LGFC-C/A, Type LGFC-WD, Type LGLLX, CLLX.

GEORGIA-PACIFIC GYPSUM L L C — Types 5, 6, 9, C, Type DGG (finish rating 20 min), Type GPFS2 (finish rating 24 min), Type GPFS6 (finish rating 20 min), Type DS, Type DAP, Type DD (finish rating 20 min), DA, DAPC, LS (finish rating 23 min), TG-C, Type X, Veneer Plaster Base - Type X, Water Rated - Type X, Sheathing - Type X, Soffit - Type X, Type X ComfortGuard Sound Deadening Gypsum Board (finish rating 27 min), Type LWX, Veneer Plaster Base-Type LWX, Water Rated-Type LWX, Sheathing Type-LWX, Soffit-Type LWX, Type DGLW, Water Rated-Type DGLW, Sheathing Type- DGLW, Soffit-Type DGLW, Type LW2X, Veneer Plaster Base - Type LW2X, Water Rated - Type LW2X, Sheathing - Type LW2X, Soffit - Type LW2X, Type DGL2W, Water Rated - Type DGL2W, Sheathing - Type DGL2W.

NATIONAL GYPSUM CO — Types FSK, FSMR-C, FSW, FSW-3, FSW-6, FSW-8, FSL, Type SBWB, RSX.

PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM — Types PG-9, PG-11, PGS-WRS, PGI

PANEL REY S A — Type PRX2

SIAM GYPSUM INDUSTRY (SARABURI) CO LTD — Type EX-1 (finish rating 26 min)

3A. **Gypsum Board* —** (As an alternate to Item 3) — 5/8 in. thick gypsum panels, with beveled, square, or tapered edges, applied either horizontally or vertically. Gypsum panels fastened to framing with 1-1/4 in. long Type W coarse thread gypsum panel steel screws spaced a max 8 in. OC, with last screw 1 in. from edge of board. When used in widths of other than 48 in., gypsum boards are to be installed horizontally.
AMERICAN GYPSUM CO — Types AGX-1 (finish rating 23 min.), M-Glass, AG-C, LightRoc (finish rating 23 min.).

CERTAINTEED GYPSUM INC — Type SilentFX, Type X-1

NATIONAL GYPSUM CO — Type FSK, Type FSK-G, Type FSW, Type FSW-3, Type FSW-5, Type FSW-G, Type FSK-C, Type FSW-C, Type FSMR-C, Type FSW-6, Type FSL

3B. **Gypsum Board* —** (As an alternate to Items 3, and 3A) — 5/8 in. thick gypsum panels, with square edges, applied either horizontally or vertically. Gypsum panels fastened to framing with 1-1/4 in. long Type W coarse thread gypsum panel steel screws spaced a max 8 in. OC, with last 2 screws 1 and 4 in. from edge of board or nailed as described in Item 3. When used in widths of other than 48 in., gypsum boards are to be installed horizontally.
GEORGIA-PACIFIC GYPSUM L L C — GreenGlass Type X, Type DGG.

3C. **Gypsum Board* —** As an alternate to Items 3, 3A, and 3B,) - 5/8 in. glass-mat faced with square edges, applied either horizontally or vertically. Gypsum panels nailed 7 in. OC with 6d cement coated nails 1-7/8 in. long, 0.0915 in. shank diam and 15/64 in. diam heads. Nails shall be placed 1 inch and 3 inch from horizontal joints and 7 inch OC thereafter.
CGC INC — Type USGX (finish rating 22 min).

UNITED STATES GYPSUM CO — Type USGX (finish rating 22 min).

USG BORAL DRYWALL SFZ LLC — Type USGX (finish rating 22 min).

USG MEXICO S A DE C V — Type USGX (finish rating 22 min).

3D. **Gypsum Board* —** (As an alternate to Items 3 through 3C) — Nominal 5/8 in. thick, 4 ft wide panels, applied vertically and secured as described in Item 3.
PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM — Type QuietRock ES.

3E. **Gypsum Board* —** (As an alternate to Item 3) — 5/8 in. thick, 4 ft. wide, applied vertically with vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Secured as described in Item 3.
CERTAINTEED GYPSUM INC — 5/8" Easi-Lite Type X (finish rating 24 min)

3F. **Wall and Partition Facings and Accessories* —** (As an alternate to Items 3 through 3E) — Nominal 5/8 in. thick, 4 ft wide panels, applied vertically and secured as described in Item 3.
PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM — Type QuietRock 527.

3G. **Gypsum Board* —** (As an alternate to 5/8 in. Type FSW in Item 3) - 2 layer Nom. 5/16 in. thick gypsum panels applied vertically. Horizontal joints on the same side need not be staggered. Inner layer attached with fasteners, as described in item 3, spaced 24 in. OC. Outer layer attached per Item 3.
NATIONAL GYPSUM CO — Type FSW.

3H. **Gypsum Board* —** (As an alternate to Item 3) — 5/8 in. thick gypsum panels, with beveled, square, or tapered edges, applied either horizontally or vertically. Gypsum panels fastened to framing with 1-1/4 in. long Type W coarse thread gypsum panel steel screws spaced a maximum 10 in. OC with the last two screws 4 and 1 in. from the edges of the board. When used in widths other than 48 in., gypsum panels are to be installed horizontally.
CERTAINTEED GYPSUM INC — Type LGFC6A (finish rating 21 min), Type LGFC2A, Type LGFC-C/A, Type LGFC-WD, Type LGLLX

4. **Joints and Nailheads —** Exposed or covered with paper tape and joint compound. For tapered, rounded-edge wallboard, joints covered with paper tape and joint compound.

5. **Non-Bearing Wall Partition Intersection —** (Optional) Two nominal 2 by 4 in. stud or nominal 2 by 6 in. stud nailed together with two 3in. long 10d nails spaced a max. 16 in. OC. vertically and fastened to one side of the minimum 2 by 4 in. stud with 3 in. long 10d nails spaced a max 16 in. OC. vertically. Intersection between partition wood studs to be flush with the 2 by 4 in. studs. The wall partition wood studs are to be framed by with a second 2 by 4 in. wood stud fastened with 3 in. long 10d nails spaced a max. 16 in. OC. vertically. Maximum one non-bearing wall partition intersection per stud cavity. Non-bearing wall partition stud depth shall be at a minimum equal to the depth of the bearing wall.

6. **Wall and Partition Facings and Accessories* —** (Optional, Not Shown) - **When the Wall Assembly is used as an External Wall, on the External side of the wall one of the following Wall and Partition and Facing Accessories may be used, refer to items (A) to (C) below.**

A. **Non Insulated System with Metal Channels —** Install moisture barrier over the Gypsum Board Item 3 and Install Acry Metal Channels vertically at a horizontal spacing not greater than 24 inches OC., over the moisture barrier. Acry Metal Channels attached through the moisture barrier and the Gypsum Board to the Wood Studs Item 1 using fasteners specified by the manufacturer and fasteners spaced max., 24 in. OC. Install Acrytec Panels on Acry Metal Channels using 1-1/4" long corrosion coated stainless steel screws spaced at a max spacing of 24 inches OC, along with manufacturer's approved adhesive (3M 540 or Tremco Vulcum 116). Adhesive to be applied in a zigzag pattern along every channel. Joint treatment in between panels shall be Tremco illmod 600 pre compressed polyurethane foam sealant.

B. **Insulated System with Metal Channels —** Install moisture barrier over the Gypsum Board Item 3. Install galvanized Z girt channels specified by the manufacturer over the moisture barrier and the Gypsum Board Item 4. Z girt channels to be installed horizontally at a max. spacing of 24" OC. Z girt channels attached through the Gypsum Board and the moisture barrier to the Wood Studs Item 1, with screws provided by the manufacturer at a max spacing of 24 inches OC. Install mineral wool insulation between the Z girts. Maximum thickness of mineral wool insulation not to exceed 6 in. As per manufacturer's instructions install Acry Metal Channels vertically over the Z girts at a max horizontal spacing of 24 in. OC. Acrytec Panels installed on Acry channel with 1-1/4" long corrosion coated stainless steel screws at a max spacing of 24 in. OC, along with manufacturers approved adhesive (3M 540 or Tremco Vulcum 116). Adhesive to be applied in a zigzag pattern along every channel. Joint treatment in between panels to be Tremco illmod 600 pre compressed polyurethane foam sealant.

C. **Non Insulated Wood Strapping System —** Install moisture barrier over the Gypsum Board Item 3 and Install 1" x 3" wood strapping vertically at a horizontal spacing not greater than 24 inches OC., over the moisture barrier. 1" x 3" wood strapping attached through the moisture barrier and the Gypsum Board to the Wood Studs Item 1, using fasteners specified by the manufacturer and fasteners spaced max., 24 in. OC. Acrytec Panels to be installed on the 1" x 3" wood strapping using manufacturers approved stainless steel fasteners spaced at maximum 24 inches OC along with Tremco Vulcum 116 adhesive applied in a zigzag pattern along every wood strap. Joint treatment in between panels to be Tremco illmod 600 pre compressed polyurethane foam sealant.

D. **Insulated Wood Strapping System —** Install moisture barrier over the Gypsum Board Item 3. Install Extruded Polystyrene Insulation over moisture barrier and the Gypsum Board Item 3, max thickness of insulation not to exceed 4 inches. Install 1" x 3" wood strapping vertically at a horizontal spacing not greater than 24 inches OC. Wood strapping attached through the Insulation, the Gypsum Board and moisture barrier to the Wood Studs Item 1 using fasteners specified by the manufacturer and fasteners spaced max. 24 in. OC. Acrytec Panels to be installed over the wood strapping using manufacturers approved stainless steel fasteners at a max spacing of 24 in. OC and Tremco Vulcum 116 adhesive applied in a zigzag pattern along every wood strap. Joint treatment in between panels to be Tremco illmod 600 pre compressed polyurethane foam sealant.

ACRYTEC PANEL INDUSTRIES — Nominal 5/8 inch thick Acrytec Panel.

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

Last Updated on 2020-10-07

The appearance of a company's name or product in this database does not in itself assure that products so identified have been manufactured under UL's Follow-Up Service. Only those products bearing the UL Mark should be considered to be Certified and covered under UL's Follow-Up Service. Always look for the Mark on the product.

UL permits the reproduction of the material contained in the Online Certification Directory subject to the following conditions: 1. The Guide Information, Assemblies, Constructions, Designs, Systems, and/or Certifications (files) must be presented in their entirety and in a non-misleading manner, without any manipulation of the data (or drawings). 2. The statement "Reprinted from the Online Certifications Directory with permission from UL" must appear adjacent to the extracted material. In addition, the reprinted material must include a copyright notice in the following format: "© 2021 UL LLC"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

UL U337

AG015

PLOT DATE: 3/28/2022 3:02:59 PM

COPYRIGHT©

Design No. U341

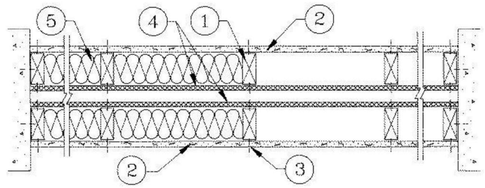
September 23, 2020

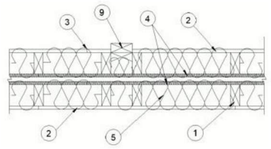
Bearing Wall Rating — 1 Hr.

Finish Rating — Min 20 min.

This design was evaluated using a load design method other than the Limit States Design Method (e.g., Working Stress Design Method). For jurisdictions employing the Limit States Design Method, such as Canada, a load restriction factor shall be used — See Guide BXUV or BXUV7

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**





HORIZONTAL SECTION

1. **Wood Studs —** Nom 2 by 4 in., spaced 24 in. OC max. Cross braced at mid-height and effectively firestopped at top and bottom of wall. No min. air space between stud rows except to accommodate attachment of sheathing, where required. See items 4 and 5.

2. **Gypsum Board* — Any 5/8 in. thick UL Classified Gypsum Board that is eligible for use in Design Nos. L501, G512 or U305.** Nom 5/8 in. thick 4 ft wide. Gypsum board applied horizontally or vertically, unless specified below, and nailed to studs and bearing plates 7 in. OC with 6d cement coated nails, 1-7/8 in. long, 0.0915 in. shank diam and 1/4 in. diam head. As an alternate, No. 6 bugle head drywall screws, 1-7/8 in. long, may be substituted for the 6d cement coated nails.

When **Steel Framing Members*** (Item 6 or any alternate clips) are used, wallboard attached to furring channels with 1 in. long Type S bugle-head steel screws spaced 12 in. OC.

When used in widths other than 48 in., gypsum board to be installed horizontally.

AMERICAN GYPSUM CO (View Classification) — CKNX.R14196

BEIJING NEW BUILDING MATERIALS PUBLIC LTD CO (View Classification) — CKNX.R19374

CABOT MANUFACTURING ULC (View Classification) — CKNX.R25370

CERTAINTEED GYPSUM INC (View Classification) — CKNX.R3660

CGC INC (View Classification) — CKNX.R19751

CONTINENTAL BUILDING PRODUCTS OPERATING CO, L L C (View Classification) — CKNX.R18482

GEORGIA-PACIFIC GYPSUM L L C (View Classification) — CKNX.R2717

LOADMASTER SYSTEMS INC (View Classification) — CKNX.R11809

NATIONAL GYPSUM CO (View Classification) — CKNX.R3501

PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM (View Classification) — CKNX.R7094

PANEL REY S A (View Classification) — CKNX.R21796

SIAM GYPSUM INDUSTRY (SARABURI) CO LTD (View Classification) — CKNX.R19262

THAI GYPSUM PRODUCTS PCL (View Classification) — CKNX.R27517

UNITED STATES GYPSUM CO (View Classification) — CKNX.R1319

USG BORAL DRYWALL SFZ LLC (View Classification) — CKNX.R38438

USG BORAL DRYWALL SFZ LLC (View Classification) — CKNX.R38438

USG MEXICO S A DE C V (View Classification) — CKNX.R16089

2A. **Gypsum Board* —** (As an alternate to Item 2, not shown) — Nominal 5/8 in. thick, 4 ft wide panels, applied vertically to studs and bearing plates on one side of the assembly with 1-5/8 in. long Type S screws spaced 12 in. OC at perimeter of panels and 8 in. OC in the field. Horizontal joints of vertically applied panels need not be backed by studs. Panel joints covered with paper tape and two layers of joint compound. Screwheads covered with two layers of joint compound. Batts and Blankets placed in stud cavity as described in Item 5C. Not evaluated for use with Steel Framing Members, Furring Channels or Fiber, Sprayed.

PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM — Type QuietRock QR-530 (finish rating 23 min).

2B. **Gypsum Board* —** (As an alternate to Item 2, not shown) — Any 5/8 in. thick gypsum panels that are eligible for use in Design Nos. L501, G512 or U305, supplied by the Classified companies listed below shown in the **Gypsum Board*** (CKNX) category. Applied horizontally or vertically and attached to studs and bearing plates with 1-1/4 in. long Type W coarse thread gypsum panel steel screws spaced a max 8 in. OC, with last screw 1 in. from edge of board. When used in widths other than 48 in., gypsum board to be installed horizontally.

UNITED STATES GYPSUM CO

USG BORAL DRYWALL SFZ LLC

USG MEXICO S A DE C V

2C. **Gypsum Board* —** (As an alternate to Item 2, Not Shown) — 5/8 in. thick gypsum panels applied horizontally or vertically and attached to studs and bearing plates with 1-1/4 in. long Type W coarse thread gypsum panel steel screws spaced a max 8 in. OC, with last screw 1 in. from edge of board. When used in widths other than 48 in., gypsum board to be installed horizontally.

AMERICAN GYPSUM CO — Types AGX-1, M-Glass, AG-C, LightRoc

CERTAINTEED GYPSUM INC — Type C, Type X or Type X-1

NATIONAL GYPSUM CO — Type FSK, Type FSK-G, Type FSW, Type FSW-3, Type FSW-5, Type FSW-G, Type FSK-C, Type FSW-C, Type FSMR-C, Type FSW-6, Type FSL

THAI GYPSUM PRODUCTS PCL — Type C or Type X

2D. **Gypsum Board* —** (As an alternate to Items 2, 2A, 2B and 2C) — 5/8 in. thick gypsum panels, with square edges, applied either horizontally or vertically. Gypsum panels fastened to framing with 1-1/4 in. long Type W coarse thread gypsum panel steel screws spaced a max 8 in. OC, with last 2 screws 1 and 4 in. from edge of board or nailed as described in Item 2. When used in widths of other than 48 in., gypsum boards are to be installed horizontally.

GEORGIA-PACIFIC GYPSUM L L C — GreenGlass Type X, Type DGG.

2E. **Gypsum Board* —** (As an alternate to Items 2 through 2D) — 5/8 in. thick, 4 ft. wide, paper surfaced applied vertically only and secured as described in Item 2.

GEORGIA-PACIFIC GYPSUM L L C — Type X ComfortGuard Sound Deadening Gypsum Board.

2F. **Gypsum Board* —** (As an alternate to Items 2 through 2E) - Installed as described in Item 2. 5/8 in. thick, 4 ft. wide, paper surfaced, applied vertically only and fastened to the studs and plates with 6d cement coated nails 1-7/8 in. long, 0.0915 in. shank diam and 1/4 in. diam heads, 7 in. OC. Not for use with item #6.

NATIONAL GYPSUM CO — Type SBWB

2G. **Gypsum Board* —** (As an alternate to Items 2 through 2F) — Nominal 5/8 in. thick, 4 ft wide panels, applied vertically and secured as described in Item 2.

PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM — Types QuietRock ES.

2H. **Gypsum Board* —** (As an alternate to Items 2 through 2G) — Installed as described in Item 2. 5/8 in. thick, 4 ft. wide, paper surfaced, applied vertically or horizontally fastened to the studs and plates with 1-1/4 in. long Type W coarse thread gypsum panel steel screws spaced a max 8 in. OC, with last screw 1 in. from edge of board.

CERTAINTEED GYPSUM INC — Type SilentFX

2I. **Wall and Partition Facings and Accessories* —** (As an alternate to Items 2 through 2H) — Nominal 5/8 in. thick, 4 ft wide panels, applied vertically and secured as described in Item 2.

PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM — Type QuietRock 527.

2J. **Gypsum Board* —** (As an alternate to 5/8 in. Type FSW in Item 2) — 2 layers nom. 5/16 in. thick gypsum panels applied vertically or horizontally. Horizontal joints on the same side need not be staggered. Inner layer attached with fasteners, as described in item 2, spaced 24 in. OC. Outer layer attached per Item 2.

NATIONAL GYPSUM CO — Type FSW.

2K. **Gypsum Board* —** (As an alternate to Item 2) — 5/8 in. thick gypsum panels, with beveled, square, or tapered edges, applied either horizontally or vertically. Gypsum panels fastened to framing with 1-1/4 in. long Type W coarse thread gypsum panel steel screws spaced a maximum 10 in. OC with the last two screws 4 and 1 in. from the edges of the board. When used in widths other than 48 in., gypsum panels are to be installed horizontally.

CONTINENTAL BUILDING PRODUCTS OPERATING CO, L L C — Type LGFC6A (finish rating 21 min), Type LGFC2A, Type LGFC-C/A, Type LGFC-WD, Type LGLLX

3. **Joints and Nailheads —** Gypsum board joints of outer layer covered with tape and joint compound. Nail heads of outer layer covered with joint compound. As an alternate, nom 3/32 in. thick gypsum veneer plaster may be applied to the entire surface of Classified veneer baseboard with joints reinforced with paper tape.

4. **Sheathing —** (Optional) — Septum may be sheathed with min 7/16 in. thick wood structural panels min grade "C-D" or "Sheathing" or min 1/2 in. thick **Mineral and Fiber Boards***.

See **Mineral and Fiber Boards** (CERZ) category for names of Classified companies.

5. **Batts and Blankets* —** 3-1/2 in. max thickness glass or mineral fiber batt insulation. **Optional** when sheathing (Item 4) is used on both halves of wall.

See **Batts and Blankets** (BZJZ) category for list of Classified companies.

5A. **Fiber, Sprayed* —** As an alternate to Batts and Blankets (Item 5) — Spray applied cellulose material. The fiber is applied with water to completely fill the enclosed cavity in accordance with the application instructions supplied with the product with a nominal dry density of 2.7 lb/ft^3. Alternate Application Method: The fiber is applied without water or adhesive at a nominal dry density of 3.5 lb/ft^3, in accordance with the application instructions supplied with the product.

U S GREENFIBER L L C — INS735, INS745 and INS750LD for use with wet or dry application. INS515LD, INS541LD, INS735, INS765LD, and INS773LD are to be used for dry application only.

5B. **Fiber, Sprayed* —** As an alternate to Batts and Blankets (Item 5) when Sheathing (Item 4) is used on both halves of wall - Spray applied cellulose insulation material. The fiber is applied with water to interior surfaces in accordance with the application instructions supplied with the product. Applied to completely fill the enclosed cavity. Minimum dry density of 4.3 pounds per cubic ft.

NU-WOOL CO INC — Cellulose Insulation

5C. **Batts and Blankets* —** (Required for use with Wall and Partition Facings and Accessories, Item 2A. Use of Sheathing, Item 4, does not nullify requirement of Item 5C for use with Item 2A) — Glass fiber insulation, nom 3-1/2 in. thick, min. density of 0.80 pcf, with a flame spread of 25 or less and a smoke developed of 50 or less, friction-fitted to completely fill the stud cavities. See Batts and Blankets Category (BKNV) for names of manufacturers.

5D. **Fiber, Sprayed* —** As an alternate to Batts and Blankets (Item 5) and Item 5A when Sheathing (Item 4) is used on both halves of wall - Spray applied cellulose fiber. The fiber is applied with water to completely fill the enclosed cavity in accordance with the application instructions supplied with the product. The minimum dry density shall be 4.30 lbs/ft^3.

INTERNATIONAL CELLULOSE CORP — Celbar-RL

5E. **Fiber, Sprayed* —** As an alternate to Batts and Blankets (Item 5) - Spray-applied cellulose material. The fiber is applied with water to completely fill the enclosed cavity in accordance with the application instructions supplied with the product. To facilitate the installation of the material, any thin, woven or non-woven netting may be attached by any means possible to the outer face the studs. The material shall reach equilibrium moisture content before the installation of materials on either face of the studs. The minimum dry density shall be 5.79 lbs/ft^3.

APPLEGATE HOLDINGS L L C — Applegate Advanced Stabilized Cellulose Insulation

6. **Steel Framing Members* —** (Optional, Not Shown) — Furring channels and Steel Framing Members as described below:

A. **Furring Channels —** Formed of No. 25 MSG galv steel. 2-9/16 in. or 2-23/32 in. wide by 7/8 in. deep, spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Ends of adjoining channels are overlapped 6 in. and tied together with double strand of No. 18 SWG galv steel wire near each end of overlap. As an alternate, ends of adjoining channels may be overlapped 6 in. and secured together with

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

UL U341

AG016

PLOT DATE: 3/28/2022 3:03:00 PM

COPYRIGHT©

two self-tapping #6 framing screws, min. 7/16 in. long at the midpoint of the overlap, with one screw on each flange of the channel. Wallboard attached to furring channels as described in Item 2.

B. **Steel Framing Members* —** Used to attach furring channels (Item a) to studs (Item 1) . Clips spaced 48 in. OC., and secured to studs with No. 8 x 2-1/2 in. coarse drywall screw through the center grommet. Furring channels are friction fitted into clips. RSIC-1 clip for use with 2-9/16 in. wide furring channels. RSIC-1 (2.75) clip for use with 2-23/32 in. wide furring channels.

PAC INTERNATIONAL L L C — Types RSIC-1, RSIC-1 (2.75).

6A. **Steel Framing Members* —** (Optional, Not Shown, As an alternate to Item 6) — Furring channels and Steel Framing Members as described below:

a. **Furring Channels —** Formed of No. 25 MSG galv steel. 2-3/8 in. wide by 7/8 in. deep, spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Ends of adjoining channels are overlapped 6 in. and tied together with double strand of No. 18 SWG galv steel wire near each end of overlap. As an alternate, ends of adjoining channels may be overlapped 6 in. and secured together with two self-tapping #6 framing screws, min. 7/16 in. long at the midpoint of the overlap, with one screw on each flange of the channel. Gypsum board attached to furring channels as described in Item 2.

b. **Steel Framing Members* —** Used to attach furring channels (Item a) to studs. Clips spaced 48 in. OC. Genie clips secured to studs with No. 8 x 1-1/2 in. coarse drywall screw through the center hole. Furring channels are friction fitted into clips.

PLITEQ INC — Type Genie Clip

6B. **Steel Framing Members* —** (Optional, Not Shown, As an alternate to Item 6) — Furring channels and Steel Framing Members as described below:

a. **Furring Channels —** Formed of No. 25 MSG galv steel. Spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Ends of adjoining channels overlapped 6 in. and tied together with double strand of No. 18 AWG galvanized steel wire. Gypsum board attached to furring channels as described in Item 2.

b. **Steel Framing Members* —** Used to attach furring channels (Item 6Ba) to studs. Clips spaced 48 in. OC., and secured to studs with 2 in. coarse drywall screw with 1 in. diam washer through the center hole. Furring channels are friction fitted into clips.

STUDCO BUILDING SYSTEMS — RESILMOUNT Sound Isolation Clips - Type A237R

6C. **Steel Framing Members* —** (Optional, Not Shown, As an alternate to Item 6) — Furring channels and Steel Framing Members as described below:

A. **Furring Channels —** Formed of No. 25 MSG galv steel. Spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item 6Cb. Ends of adjoining channels overlapped 6 in. and tied together with double strand of No. 18 AWG galvanized steel wire. Gypsum board attached to furring channels as described in Item 2.

B. **Steel Framing Members* —** Used to attach furring channels (Item 6CA) to studs. Clips spaced 48 in. OC., and secured to studs with No. 8 x 2-1/2 in. coarse drywall screw through the center hole. Furring channels are friction fitted into clips.

REGUPOL AMERICA — Type SonusClip

6D. **Steel Framing Members* —** (Optional, Not Shown, As an alternate to Item 6) — Resilient channels and Steel Framing Members as described below:

a. **Resilient Channels —** Formed of No. 25 MSG galv steel, spaced 24 in. OC, and perpendicular to studs. Channels secured to studs as described in Item b. Ends of adjoining channels overlapped 6 in. and secured in place with two No. 8 15 x 1/2 in. Philips Modified Truss screws spaced 2-1/2 in. from the center of the overlap. Gypsum board attached to resilient channels as described in Item 2.

b. **Steel Framing Members* —** Used to attach resilient channels (Item 6Da) to studs. Clips spaced 48 in. OC., and secured to studs with No. 8 x 2-1/2 in. coarse drywall screw through the center hole. Resilient channels are secured to clips with one No. 10 x 1/2 in. pan-head self-drilling screw.

KEENE BUILDING PRODUCTS CO INC — Type RC+ Assurance Clip

6E. **Steel Framing Members* —** (Optional, Not Shown, As an alternate to Item 6) — Used as an alternate method to attach resilient channels to wall studs. A resilient sound isolation accessory shall be used at each attachment point of the resilient channels and spaced max 24 in. O.C. Channel ends butted and centered under the structural members and attached with one accessory at each end. Additional accessories used to hold resilient channels that support the gypsum board end joints. The accessory envelops the mounting edge of the resilient channel. The accessory and resilient channel are fastened to the structural members with the screws supplied with the accessory and per the accessory manufacturer's installation instructions.

PAC INTERNATIONAL L L C — Type RC-1 Boost

6F **Steel Framing Members* —** (Optional, Not Shown, As an alternate to Item 6) — Furring channels and Steel Framing Members as described below:

a **Furring Channels —** Formed of No. 25 MSG galv steel. 2-23/32 in. wide by 7/8 in. or 1-1/2 in. deep, spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Ends of adjoining channels are overlapped 6 in. and tied together with double strand of No. 18 SWG galv steel wire near each end of overlap. As an alternate, ends of adjoining channels may be overlapped 6 in. and secured together with two self-tapping #6 framing screws, min. 7/16 in. long at the midpoint of the overlap, with one screw on each flange of the channel. Gypsum board attached to furring channels as described in Item 2.

b **Steel Framing Members* —** Used to attach furring channels (Item 6Fa) to studs. Clips spaced maximum 48 in. OC. Clips secured to studs with No. 8 x 2-1/2 in. coarse drywall screw through the center grommet. Furring channels are friction fitted into clips.

CLARKDIETRICH BUILDING SYSTEMS — Type ClarkDietrich Sound Clip

7. **Wall and Partition Facings and Accessories* —** (Optional, Not shown) — Nominal 1/2 in. thick, 4 ft wide panels, for optional use as an additional layer on one or both sides of the assembly. Panels attached in accordance with manufacturer's recommendations. When the QR-500 or QR-510 panel is installed between the wood framing and the UL Classified gypsum board, the required UL Classified gypsum board layer(s) is/are to be installed as indicated as to fastener type and spacing, except that the required fastener length shall be increased by a minimum of 1/2 in. Not evaluated or intended as a substitute for the required layer(s) of UL Classified Gypsum Board.

PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM — Type QuietRock QR-500 and QR-510

8. **Mineral and Fiber Board* —** ((Optional, Not Shown) — For optional use as an additional layer on one or both sides of wall. Nom 1/2 in. thick, 4 ft wide with long dimension parallel and centered over studs. Attached to framing as described in Item 2. The required UL Classified gypsum board layer(s) is/are to be installed as indicated as to fastener type and spacing, except that the required fastener length shall be increased by a minimum of 1/2 in. Not evaluated or intended as a substitute for the required layer(s) of UL Classified Gypsum Board.

HOMASOTE CO — Homasote Type 440-32

9. **Non-Bearing Wall Partition Intersection —** (Optional) — Two nominal 2 by 4 in. stud or nominal 2 by 6 in. stud nailed together with two 3in. long 10d nails spaced a max. 16 in. OC. vertically and fastened to one side of the minimum 2 by 4 in. stud with 3 in. long 10d nails spaced a max 16 in. OC. vertically. Intersection between partition wood studs to be flush with the 2 by 4 in. studs. The wall partition wood studs are to be framed by with a second 2 by 4 in. wood stud fastened with 3 in. long 10d nails spaced a max. 16 in. OC. vertically. Maximum one non-bearing wall partition intersection per stud cavity. Non-bearing wall partition stud depth shall be at a minimum equal to the depth of the bearing wall.

(Optional, Not Shown) Alternate Construction For Use On One Side Of The Wall.

10. **Mineral and Fiber Board* —** For use with Items 10A-10D) —Nom 1/2 in. thick, 4 ft wide with long dimension parallel and centered over studs. Attached to framing with minimum 1-3/8 in. long ring shanked nails or 1-1/4 in. long Type W steel screws, spaced 12 in. OC along board edges and 24 in. OC in field of board along intermediate framing. Not evaluated or intended as a substitute for the required layer(s) of UL Classified Gypsum Board.

HOMASOTE CO — Homasote Type 440-32

10A. **Glass Fiber Insulation —** (For use with Item 10) — 3-1/2 in. thick glass fiber batts bearing the UL Classification Marking as to Surface Burning and/or Fire Resistance, placed to fill the interior of the wall. See Batts and Blankets (BKNV or BZJZ) categories for names of Classified companies.

10B. **Batts and Blankets* —** (As an alternate to Item 10B, For use with Item 10), 3 in. thick mineral wool batts, placed to fill interior of wall, attached to the 3-1/2 in. face of the studs with staples placed 24 in. OC.

THERMAFIBER INC — Type SAFB, SAFB FF

10C. **Adhesive —** (For use with Item 10) — Construction grade adhesive applied in vertical, serpentine, nominal 3/8 in. wide beads down the length of both vertical edges of Mineral and Fiber Board (Item 14A).

10D. **Gypsum Board* —** (For use with Item 10) — 5/8 in. thick, 4 ft wide, applied vertically over Mineral and Fiber Board (Item 14A) with vertical joints located anywhere over stud cavities. Secured to mineral and fiber boards with 1-1/2 in. Type G Screws spaced 8 in. OC along edges of each vertical joint and 12 in. OC in intermediate field of the Mineral and Fiber Board (Item 10). Secured to outermost studs and bearing plates with 2 in. long Type S screws spaced 8 in. OC. Gypsum Board joints covered with paper tape and joint compound. Screw heads covered with joint compound. Finish Rating 30 Min.

AMERICAN GYPSUM CO — Type AG-C

CERTAINTEED GYPSUM INC — Type C

CONTINENTAL BUILDING PRODUCTS OPERATING CO, L L C — Type LGFC-C/A

GEORGIA-PACIFIC GYPSUM L L C — Types 5, DAPC, TG-C

NATIONAL GYPSUM CO — Types FSK-C, FSW-C

PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM — Type PG-C

PANEL REY S A — Type PRC

THAI GYPSUM PRODUCTS PCL — Type C

UNITED STATES GYPSUM CO — Type CTypes C, IP-X2, IPC-AR

USG BORAL DRYWALL SFZ LLC — Type C

USG MEXICO S A DE C V — Types C, IP-X2, IPC-AR

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

Last Updated on 2020-09-23

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

UL U341 (CONT'D)

AG017

PLOT DATE: 3/28/2022 3:03:01 PM

COPYRIGHT©

UL Product iQ™

BXUV.L570

Design/System/Construction/Assembly Usage Disclaimer

- Authorities Having Jurisdiction should be consulted in all cases as to the particular requirements covering the installation and use of UL Certified products, equipment, system, devices, and materials.
- Authorities Having Jurisdiction should be consulted before construction.
- Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with applicable requirements. The published information cannot always address every construction nuance encountered in the field.
- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.
- Only products which bear UL's Mark are considered Certified.

BXUV - Fire Resistance Ratings - ANSI/UL 263 Certified for United States

BXUV7 - Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada

See General Information for Fire-resistance Ratings - ANSI/UL 263 Certified for United States
Design Criteria and Allowable Variances

See General Information for Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada
Design Criteria and Allowable Variances

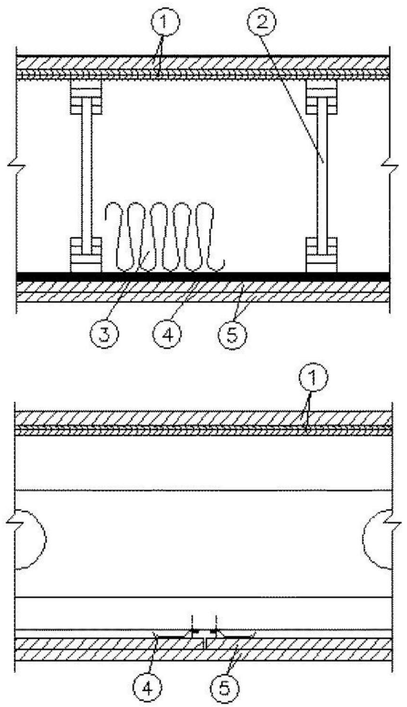
Design No. L570

August 27, 2021

Unrestrained Assembly Rating — 1 Hr.

This design was evaluated using a load design method other than the Limit States Design Method (e.g., Working Stress Design Method). For jurisdictions employing the Limit States Design Method, such as Canada, a load restriction factor shall be used — See Guide BXUV or BXUV7

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**



1. **Flooring System —** The flooring system shall consist of one of the following:

System No. 1

Subflooring — Nom 19/32 in. thick wood structural panels installed perpendicular to the joists with end joints staggered. Plywood or panels secured to joists with construction adhesive and No. 6d ringed shank nails, spaced 12 in. OC along each joist. Staples having equal or greater withdrawal and lateral resistance strength may be substituted for the 6d nails.

Vapor Barrier — (Optional) — Nom 0.030 in. thick commercial asphalt saturated felt.

Finish Floor — Min 1 by 4 in. T & G lumber installed perpendicular to the joists, or min 15/32 in. thick wood structural panels, min grade "Underlayment" or "Single-Floor". Face grain of plywood or strength axis of panel to be perpendicular to joists with joints staggered.

System No. 2

Subflooring — Nom 19/32 in. thick wood structural panels installed perpendicular to the joists with end joints staggered. Plywood or panels secured to joists with construction adhesive and No. 6d ringed shank nails, spaced 12 in. OC along each joist. Staples having equal or greater withdrawal and lateral resistance strength may be substituted for the 6d nails.

Vapor Barrier — (Optional) — Nom 0.010 in. thick commercial asphalt saturated felt.

Finish Flooring — Floor Topping Mixture* — Min 3/4 in. thickness of floor topping mixture having a minimum compressive strength of 1800 psi. Refer to manufacturer's instructions accompanying the material for specific mix design.

UNITED STATES GYPSUM CO — Types LRK, HSLRK, CSD

LATICRETE SUPERCAP L L C — Types LRK, HSLRK

USG MEXICO S A DE C V — Types LRK, HSLRK, CSD

Floor Mat Materials* — (Optional) — Floor mat material loose laid over the subfloor. Refer to manufacturer's instructions regarding the minimum thickness of floor topping over each floor mat material.

UNITED STATES GYPSUM CO — Types SAM, LEVELROCK® Brand Sound Reduction Board, LEVELROCK® Brand Floor Underlayment SRM-25

Alternate Floor Mat Materials* — (Optional) — Floor mat material loosely laid over the subfloor. Refer to manufacturer's instructions regarding minimum thickness of floor topping over floor mat.

GRASSWORX L L C — SC Types

System No. 3

Subflooring — Nom 19/32 in. thick wood structural panels installed perpendicular to the joists with end joints staggered. Plywood or panels secured to joists with construction adhesive and No. 6d ringed shank nails, spaced 12 in. OC along each joist. Staples having equal or greater withdrawal and lateral resistance strength may be substituted for the 6d nails.

Vapor Barrier — (Optional) — Nom 0.030 in. thick commercial asphalt saturated felt.

Finish Flooring — Floor Topping Mixture* — Min 3/4 or 1 in. thickness of floor topping mixture for 19/32 or 15/32 in. thick wood structural panels respectively, having a min compressive strength of 1000 psi. Refer to manufacturer's instructions accompanying the material for specific mix design.

ARCOSA SPECIALTY MATERIALS — AccuCrete® Types NexGen, Green, Prime and PrePour, AccuRadiant®, AccuLevel® Types G40, G50 and SD30

Alternate Floor Mat Material* — (Optional) — Floor mat material nominal 2 - 9.5 mm thick loose laid over the subfloor. Floor topping shall be a min of 3/4 in. or 1 in. thick for 19/32 or 15/32 in. thick wood structural panels respecitively.

ARCOSA SPECIALTY MATERIALS — AccuQuiet® Types D13, D-18, D25, DX38, EM.125, EM.125S, EM.250, EM.250S, EM.375, EM.375S, EM.750, and EM.750S.

System No. 4

Structural Cement-Fiber Units* — Nom 3/4 in. thick, with long edges tongue and grooved. Long dimension of panels to be perpendicular to joists with end joints staggered a min of 2 ft and centered over the joists. Panels secured to joists with 1-5/8 in. long No. 8 self-drilling, self-countersinking steel screws spaced a max of 12 in. OC in the field with a screw located 1 in. and 2 in. from each edge, and 8 in. OC on the perimeter with a screw located 2 in. from each edge, located 1/2 in. from the side edges of the panel.

UNITED STATES GYPSUM CO — Types STRUCTO-CRETE, USGSP

System No. 5

Subflooring — Min 19/32 in. thick wood structural panels, min grade "C-D" or "Sheathing". Face grain of plywood or strength axis of panels to be perpendicular to the joists with joints staggered.

Vapor Barrier — (Optional) — Commercial asphalt saturated felt, 0.030 in. thick.

Vapor Barrier — (Optional) — Nom 0.010 in. thick commercial rosin-sized building paper.

Finish Flooring* — Min 3/4 in. thickness of any Floor Topping Mixture bearing the UL Classification Marking as to Fire Resistance. See Floor- and Roof-Topping Mixtures (CCOX) category for names of Classified Companies.

Floor Mat Materials* — (Optional) — Nom. 1/4 in. thick loose laid over the subfloor. Floor topping thickness shall be a minimum of 3/4 in.

KEENE BUILDING PRODUCTS CO INC — Type Quiet Qurl 55/025 and Quiet Qurl 55/025 N

Alternate Floor Mat Materials* — (Optional) — Floor mat material Nom. 3/8 in. thick loose laid over the subfloor. Floor topping thickness shall be a minimum of 1 in.

KEENE BUILDING PRODUCTS CO INC — Type Quiet Qurl 60/040 and Quiet Qurl 60/040 N

Alternate Floor Mat Materials* — (Optional) — Floor mat material Nom. 3/4 in. thick loose laid over the subfloor. Floor topping thickness shall be a minimum of 1-1/2 in.

KEENE BUILDING PRODUCTS CO INC — Type Quiet Qurl 65/075, Quiet Qurl 65/075 N

Alternate Floor Mat Materials* — (Optional) — Floor mat material Nom. 1/8 in. thick loose laid over the subfloor. Floor topping thickness shall be a minimum of 3/4 in.

KEENE BUILDING PRODUCTS CO INC — Type Quiet Qurl 52/013 and Quiet Qurl 52/013 N

Alternate Floor Mat Materials* — (Optional) — Floor mat material Nom. 1/4 in. entangled net core with a compressible fabric attached to the bottom loose laid over the subfloor. Floor topping thickness shall be a minimum of 1 in.

KEENE BUILDING PRODUCTS CO INC — Quiet Qurl 55/025 MT and Quiet Qurl 55/025 N MT

System No. 6

Subflooring — Nom 19/32 in. thick wood structural panels installed perpendicular to the joists with end joints staggered. Plywood or panels secured to joists with construction adhesive and No. 6d ringed shank nails, spaced 12 in. OC along each joist. Staples having equal or greater withdrawal and lateral resistance strength may be substituted for the 6d nails.

Finish Flooring - Floor Topping Mixture* — Min 3/4 in. thickness of floor topping mixture having a min compressive strength of 1100 psi. Mixture shall consist of 6.8 gal of water to 80 lbs of floor topping mixture to 1.9 cu ft of sand.

HACKER INDUSTRIES INC — Firm-Fill Gypsum Concrete, Firm-Fill 2010, Firm-Fill 3310, Firm-Fill 4010, Firm-Fill High Strength and Gyp-Span Radiant

Metal Lath — (Optional) — For use with 3/8 in. (10 mm) floor mat materials, 3/8 in. expanded steel diamond mesh, 3.4 lbs/sq yd placed over the floor mat material. Hacker Floor Primer to be applied prior to the placement of the metal lath. When metal lath is used, floor topping thickness a nom 1-1/4 in. over the floor mat.

Floor Mat Materials* — (Optional) Floor mat material nom 5/64 in. (2 mm) thick adhered to subfloor with Hacker Floor Primer. Primer to be applied to the surface of the mat prior to the placement of a min 1 in. of floor-topping mixture.

HACKER INDUSTRIES INC — Type Hacker Sound-Mat.

Alternate Floor Mat Materials — (Optional) — Floor mat material nom 1/4 in. (6 mm) thick adhered to subfloor with Hacker Floor Primer. Primer to be applied to the surface of the mat prior to the placement of a min 1-1/4 in. (32 mm) of floor-topping mixture.

HACKER INDUSTRIES INC — Type Hacker Sound-Mat II.

Alternate Floor Mat Materials — (Optional) — Floor mat material nom 1/8 in. (3 mm) thick loose laid over the subfloor. Floor topping thickness shall be a min of 3/4 in. (19 mm)

HACKER INDUSTRIES INC — FIRM-FILL SCM 125

Alternate Floor Mat Materials — (Optional) — Floor mat material nom 1/4 in. (6 mm) thick loose laid over the subfloor. Floor topping thickness shall be a min of 1 in. (25 mm)

HACKER INDUSTRIES INC — Type FIRM-FILL SCM 250, Quiet Qurl 55/025

Alternate Floor Mat Materials — (Optional) — Floor mat material nom 3/8 in. (10 mm) thick loose laid over the subfloor. Floor topping thickness shall be a min of 1-1/4 in. (32 mm)

HACKER INDUSTRIES INC — FIRM-FILL SCM 400, Quiet Qurl 60/040

Alternate Floor Mat Materials — (Optional) — Floor mat material nom 3/4 in. (19 mm) thick loose laid over the subfloor. Floor topping thickness shall be a min of 1-1/2 in. (38 mm)

HACKER INDUSTRIES INC — Type FIRM-FILL SCM 750, Quiet Qurl 65/075

System No. 7

Subflooring — Nom 19/32 in. thick wood structural panels installed perpendicular to the joists with end joints staggered. Plywood or panels secured to joists with construction adhesive and No. 6d ringed shank nails, spaced 12 in. OC along each joist. Staples having equal or greater withdrawal and lateral resistance strength may be substituted for the 6d nails.

Finish Floor — Mineral and Fiber Board* — Min 1/2 in. thick, supplied in sizes ranging from 3 ft by 4 ft to 8 ft by 12 ft. All joints to be staggered a min of 12 in. with adjacent sub-floor joints.

HOMASOTE CO — Type 440-32 Mineral and Fiber Board

System No. 8

Subflooring — Nom 19/32 in. thick wood structural panels installed perpendicular to the joists with end joints staggered. Plywood or panels secured to joists with construction adhesive and No. 6d ringed shank nails, spaced 12 in. OC along each joist. Staples having equal or greater withdrawal and lateral resistance strength may be substituted for the 6d nails.

Vapor Barrier — (Optional) — Nom 0.030 in thick commercial asphalt saturated felt.

Finish Flooring - Floor Topping Mixture* — Min 3/4 in. thickness of floor topping mixture having a min compressive strength of 1500 psi. Refer to manufacturer's instructions accompanying the material for specific mix design.
MAXXON CORP — Type Maxxon Standard and Maxxon High Strength

Floor Mat Materials* — (Optional) - Floor mat material loose laid over the subfloor. Refer to manufacturer's instructions regarding the minimum thickness of floor topping over each floor mat material.
MAXXON CORP — Type Encapsulated Sound Mat.

Floor Mat Reinforcement — (Optional) Refer to manufacturer's instructions regarding minimum thickness of floor topping for use with floor mat reinforcement.

Metal Lath — (Optional) 3/8 in. expanded galvanized steel diamond mesh, 3.4 lbs/sq yd loose laid over the floor mat material.

Fiber Glass Reinforcement — (Optional) 0.015 in. thick PVC coated non-woven fiberglass mesh, 0.368 lbs./sq. yd loose laid over the floor mat material.

System No. 9

Subflooring — Nom 19/32 in. thick wood structural panels installed perpendicular to the joists with end joints staggered. Plywood or panels secured to joists with construction adhesive and No. 6d ringed shank nails, spaced 12 in. OC along each joist. Staples having equal or greater withdrawal and lateral resistance strength may be substituted for the 6d nails.

Vapor Barrier — (Optional) Nom 0.030 in. thick commercial asphalt saturated felt.

Finish Flooring — Floor Topping Mixture* — Min 3/4 in. thickness of floor topping mixture having a minimum compressive strength of 1500 psi. Refer to manufacturer's instructions accompanying the material for specific mix design.
FORMULATED MATERIALS LLC — Types FR-25, FR-30, and SiteMix

Alternate Floor Mat Material* — (Optional) Floor mat material nominal 2 - 9.5 mm thick loose laid over the subfloor. Floor topping thickness shall be a minimum of 3/4 in.
FORMULATED MATERIALS LLC — Types M1, M2, M3, Elite, Duo, R1, and R2

System No. 10

Subflooring — Min 19/32 in. thick wood structural panels, min grade "C-D" or "Sheathing". Face grain of plywood or strength axis of panels to be perpendicular to the joists with joints staggered.

Vapor Barrier — (Optional) — Commercial asphalt saturated felt, 0.030 in. thick.

Vapor Barrier — (Optional) — Nom 0.010 in. thick commercial rosin-sized building paper.

Finish Flooring* — Min 3/4 in. thickness of any Floor Topping Mixture bearing the UL Classification Marking as to Fire Resistance. See Floor- and Roof-Topping Mixtures (CCOX) category for names of Classified Companies.

Floor Mat Materials* — (Optional) — Nom 3/32 in. thick loose laid over the subfloor. Floor topping thickness shall be a minimum of 3/4 in.

PLITEQ INC — Type GenieMat RST02

Floor Mat Materials* — (Optional) — Nom 3/16 in. thick loose laid over the subfloor. Floor topping thickness shall be a minimum of 3/4 in.

PLITEQ INC — Type GenieMat FF03NP

Floor Mat Materials* — (Optional) — Nom 1/4 in. thick loose laid over the subfloor. Floor topping thickness shall be a minimum of 3/4 in.

PLITEQ INC — Type GenieMat FF06

Floor Mat Materials* — (Optional) — Nom 3/8 in. thick loose laid over the subfloor. Floor topping thickness shall be a minimum of 1 in.

PLITEQ INC — Type GenieMat FF10

Floor Mat Materials* — (Optional) — Nom 3/4 in. thick loose laid over the subfloor. Floor topping thickness shall be a minimum of 1-1/2 in.

PLITEQ INC — Type GenieMat FF17

Floor Mat Materials* — (Optional) — Nom 1 in. thick loose laid over the subfloor. Floor topping thickness shall be a minimum of 1-1/2 in.

PLITEQ INC — Type GenieMat FF25

System No. 11

Subflooring — Nom 19/32 in. thick wood structural panels installed perpendicular to the joists with end joints staggered. Plywood or panels secured to joists with construction adhesive and No. 6d ringed shank nails, spaced 12 in. OC along each joist. Staples having equal or greater withdrawal and lateral resistance strength may be substituted for the 6d nails.

Vapor Barrier — (Optional) — Nom 0.030 in. thick commercial asphalt saturated felt.

Finish Flooring — Floor Topping Mixture* — Min 3/4 or 1 in. thickness of floor topping mixture for 19/32 or 15/32 in. thick wood structural panels respectively, having a min compressive strength of 1000 psi. Refer to manufacturer's instructions accompanying the material for specific mix design.
DEPENDABLE LLC — GSL M3.4, GSL K2.6, GSL-CSD, GSL RH and SKIMFLOW

Floor Mat Materials* — (Optional) — Nom. 1/4 in. thick loose laid over the subfloor. Floor topping thickness shall be a minimum of 3/4 in.
KEENE BUILDING PRODUCTS CO INC — Type Quiet Qurl 55/025 and Quiet Qurl 55/025 N

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

UL L570

AG018

PLOT DATE: 3/28/2022 3:03:01 PM

COPYRIGHT©

Alternate Floor Mat Materials* — (Optional) — Floor mat material Nom. 3/8 in. thick loose laid over the subfloor. Floor topping thickness shall be a minimum of 1 in.
KEENE BUILDING PRODUCTS CO INC — Type Quiet Qurl 60/040 and Quiet Qurl 60/040 N

Alternate Floor Mat Materials* — (Optional) — Floor mat material Nom. 3/4 in. thick loose laid over the subfloor. Floor topping thickness shall be a minimum of 1-1/2 in.
KEENE BUILDING PRODUCTS CO INC — Type Quiet Qurl 65/075, Quiet Qurl 65/075 N

Alternate Floor Mat Materials* — (Optional) — Floor mat material Nom. 1/8 in. thick loose laid over the subfloor. Floor topping thickness shall be a minimum of 3/4 in.
KEENE BUILDING PRODUCTS CO INC — Type Quiet Qurl 52/013 and Quiet Qurl 52/013 N

Alternate Floor Mat Materials* — (Optional) — Floor mat material Nom. 1/4 in. entangled net core with a compressible fabric attached to the bottom loose laid over the subfloor. Floor topping thickness shall be a minimum of 1 in.
KEENE BUILDING PRODUCTS CO INC — Quiet Qurl 55/025 MT and Quiet Qurl 55/025 N MT

System No. 12

Subflooring — Nom 19/32 in. thick wood structural panels installed perpendicular to the joists with end joints staggered. Plywood or panels secured to joists with construction adhesive and No. 6d ringed shank nails, spaced 12 in. OC along each joist. Staples having equal or greater withdrawal and lateral resistance strength may be substituted for the 6d nails.

Finish Flooring* — Floor Topping Materials — Min 3/4 in. to 1-1/2 in. thickness of any Floor Topping Mixture bearing the UL Classification Marking as to Fire Resistance with a minimum compressive strength of 1500 psi.
See **Floor- and Roof-Topping Mixtures** (CCOX) category for names of Classified Companies.

Floor Mat Materials* — (Optional) — Floor mat material nom 1/8 in. to 3/4 in. thick. Loose laid over the subfloor. When used, Acousti-flor CSM (crack suppression mat) is loose laid over the floor mat material. Floor topping material thickness is dependent on thickness of floor mat used.
WALFLOR INDUSTRIES INC — Type Acousti-flor, Acousti-flor CSM. Floor topping thickness depends on products used as follows:

Acousti-flor (1/8 in. thick) - Floor topping thickness shall be a minimum of 3/4 in.

Acousti-flor (1/4 in. thick) - Floor topping thickness shall be a minimum of 1 in.

Acousti-flor (3/8 in. thick) - Floor topping thickness shall be a minimum of 1 in.

Acousti-flor (3/4 in. thick) - Floor topping thickness shall be a minimum of 1-1/2 in.

Metal Lath — (Optional) — Expanded steel diamond mesh, 2.5 lb / sq yd loose laid over floor mat material.

Fiberglass Mesh Reinforcement — (Optional) — Coated non-woven glass fiber mesh grid loose laid over floor mat material.

System No. 13

Structural Cement-Fiber Units* — For use with **UNITED STATES GYPSUM CO** gypsum boards only. Nom 3/4 in. thick, with long edges tongue and grooved. Long dimension of panels to be perpendicular to wood trusses with end joints staggered a min of 2 ft and centered over the trusses. Panels secured to wood trusses with 1-5/8 in. long, No. 8, self- countersinking wood screw spaced a max of 12 in. OC in the field with a screw located 1 in. and 2 in. from each edge, and 8 in. OC on the perimeter with a screw located 2 in. from each edge, located 1/2 in. from the end edges of the panel.
UNITED STATES GYPSUM CO — Types STRUCTO-CRETE, USGSP

System No. 14

Subflooring — Nom 19/32 in. thick wood structural panels installed perpendicular to the joists with end joints staggered. Plywood or panels secured to joists with construction adhesive and No. 6d ringed shank nails, spaced 12 in. OC along each joist. Staples having equal or greater withdrawal and lateral resistance strength may be substituted for the 6d nails.

Finish Flooring - Floor Topping Mixture* — Min 1 in. thickness of floor topping mixture having a min compressive strength of 4500 psi. Refer to manufacturer's instructions accompanying the material for specific mix design.
SIKA DEUTSCHLAND GMBH — Type SCHONOX AP Rapid Plus

System No. 15

Subflooring — Building Units* — Nom. 1-1/2 in. thick T & G laminated composite plywood sub-floor panels to be perpendicular to the trusses with end joints staggered 4 ft. End joints centered over top chord of trusses. Subfloor panels secured to trusses with construction adhesive and #8 by 3 in. wood screws spaced 12 in. OC in the field and 6 in. OC at the end joints.
RSP INDUSTRIES INC — SAP board

System No. 16

Subflooring — Nom 19/32 in. thick wood structural panels installed perpendicular to the joists with end joints staggered. Plywood or panels secured to joists with construction adhesive and No. 6d ringed shank nails, spaced 12 in. OC along each joist. Staples having equal or greater withdrawal and lateral resistance strength may be substituted for the 6d nails.

Vapor Barrier — (Optional) - Commercial asphalt saturated felt, 0.030 in. thick.

Vapor Barrier — (Optional) - Nom 0.010 in. thick commercial rosin-sized building paper.

Finish Flooring - Floor Topping Mixture* — Min 3/4 in. thickness of any Floor Topping Mixture bearing the UL Classification Marking as to Fire Resistance. See Floor- and Roof-Topping Mixtures (CCOX) category for names of Classified Companies.

Floor Mat Materials* — (Optional, Not Shown) - Floor mat material loose laid over the subfloor. Refer to manufacturer's instructions regarding the minimum thickness of floor topping over each floor mat material.
LOW & BONAR INC — EnkaSonic® by Colbond a member of the Low & Bonar group Types 125, 250, 250 Plus, 400, 400 Plus, 750 and 750 Plus.

Floor Mat Reinforcement — (Optional) - Refer to manufacturer's instructions regarding minimum thickness of floor topping for use with floor mat reinforcement.

Metal Lath — (Optional) — Expanded steel diamond mesh, 2.5 lb / sq yd loose laid over floor mat material.

Fiberglass Mesh Reinforcement — (Optional) — Coated non-woven glass fiber mesh grid loose laid over floor mat material.

System No. 17

Subflooring — Building Units* — Nom 3/4 in. thick, tongue and grooved boards. Long dimension of boards to be perpendicular to joists with end joints staggered a min of 4 ft. and centered over the joists. Boards secured to joists with min 1-1/4 in. long screws or 2 in. x 0.113 in. Ring Shank nails spaced a max of 12 in. OC in the field with screws/nails located 1 in. from long edge, and max 8 in. OC along the end joints with screws/nails located 1/2 in. from end joint.

ECTEK INTERNATIONAL INC — Type MegaBoard, 3/4 in. thick

Finish Floor (optional) — Building Units* — Min 1/2 in. thick, supplied in 4 by 8 ft panels, fastened to joists through subfloor with 2-3/8 in. long 8d ringed shank nails spaced a max of 12 in. OC. All joints to be staggered a min of 12 in. with adjacent sub-floor joints.

ECTEK INTERNATIONAL INC — Type MegaBoard, 1/2 in. thick

2. **Structural Wood Members* —** Min 9-1/2 in. deep "I" shaped wood joists spaced at a max of 19.2 in. OC. Joists shall conform to ICC-ES ESR-1153 Report. Joist top and bottom chords minimum 1-3/8 in. deep by 2.3 in. wide and constructed of either Microllam laminated veneer lumber (LVL) or TimberStrand laminated strand lumber (LSL). Webs constructed of minimum 3/8 in. thick Performance Plus OSB, PS2, Exposure 1. Installation shall be in accordance with manufacturers published literature. Spacing may be increased to 24 in. OC when **Batts and Blankets*** (Item 3B) is used.

3. **Insulation — Batts and Blankets* —** (Optional) — Glass fiber insulation, secured to the subflooring with staples, or to the wood joists with 0.090 in. diam galv steel wires, or draped over the resilient channel/gypsum panel (or Steel Framing Members/gypsum panel) ceiling membrane. Any thickness of glass fiber insulation bearing the UL Classification Marking as to Surface Burning Characteristics and/or Fire Resistance.

3A. **Insulation — Loose Fill Material* —** (Optional) — As an alternate to Item 3 — Any thickness of loose fill material bearing the UL Classification Marking for Surface Burning Characteristics, applied within the concealed space, over the resilient or furring channel/gypsum panel or Steel Framing Members/gypsum panel ceiling membrane.

3B. **Insulation - Batts and Blankets* —** (Optional) — Min. 1 in. thick glass fiber insulation bearing the UL Classification Marking as to Surface Burning Characteristics and/or Fire Resistance draped over the resilient channel/gypsum panel (or Steel Framing Members/gypsum panel) ceiling membrane.

4. **Resilient Channels —** Formed from 25 MSG galv steel installed perpendicular to the joists. When no insulation is installed in the concealed space the resilient channels are spaced 24 in. OC. When insulation (Item 3) is installed to the underside of the subfloor the resilient channels are spaced . 16 in. OC When insulation (Items 3, 3A or 3B) is applied over the resilient channel/gypsum panel ceiling membrane, the resilient channels are spaced 12 in. OC.. Two courses of resilient channel positioned 6 in. OC at gypsum panel butt-joints (3 in. from each end of wallboard). Channels oriented opposite at gypsum panel butt-joints. Channel splices overlapped 4 in. beneath wood trusses. Channels secured to each truss with 1-1/4 in. long Type S screws.

4A. **Alternate Steel Framing Members —** (Not Shown) — As an alternate to Item 4, main runners, cross tees, cross channels and wall angle as listed below.
a. **Main Runners —** Nom 10 or 12 ft long, 15/16 in. or 1-1/2 in. wide face, spaced 4 ft. OC. Main runners suspended by min 12 SWG galv steel hanger wires spaced 48 in. OC. Hanger wires to be located adjacent to main runner/cross tee intersections. Hanger wires wrapped and twist-tied on 16d nails driven in to side of joists at least 5 in. above the bottom face.

b. **Cross Tees —** Nom 4 ft long, 1-1/2 in. wide face, installed perpendicular to the main runners, spaced 16 in. OC. Additional cross tees or cross channels used at 8 in. from each side of butted gypsum panel end joints. The cross tees or cross channels may be riveted or screw attached to the wall angle or channel to facilitate the ceiling installation.

c. **Cross Channels —** Nom 4 or 12 ft long, installed perpendicular to main runners, spaced 16 in. OC. When Batts and Blankets (Item 5) are used, cross channels spaced 16 in. OC.

d. **Wall Angle or Channel —** Painted or galv steel angle with 1 in. legs or channel with 1 in. legs, 1-9/16 in. deep attached to walls at perimeter of ceiling with fasteners 16 in. OC. To support steel framing member ends and for screw-attachment of the gypsum panels.
CGC INC — Type DGL or RX

USG INTERIORS LLC — Type DGL or RX

4B. **Alternate Steel Framing Members* —** (Not Shown) — As an alternate to Items 4 and 4A, furring channels and Steel Framing Members as described below.
a. **Furring Channels —** Formed of No. 25 MSG galv steel. 2-9/16 in. or 2-23/32 in. wide by 7/8 in. deep, spaced 24 in. OC, perpendicular to joists. When insulation, Items 3, 3A, or 3B is used, the furring channel spacing shall be reduced as described in Item 4. Channels secured to joists as described in Item b. Ends of adjoining channels overlapped 6 in. and tied together with double strand of No. 18 SWG galv steel wire near each end of overlap.

b. **Steel Framing Members* —** Used to attach furring channels (Item a) to the wood joists (Item 2). When wood joists are spaced 19.2 in. OC, clips spaced a max of 38.4 in. OC. When wood joists are spaced 16 or 24 in. OC, clips spaced a max of 48 in. OC. RSIC-1 and RSIC-1 (2.75) clips secured to alternating joists with No. 8 x 2-1/2 in. coarse drywall screw through the center grommet. RSIC-V and RSIC-V (2.75) clips secured to alternating joists with No. 8 x 1-1/2 in. coarse drywall screw through the center hole. Furring channels are friction fitted into clips. RSIC-1 and RSIC-V clips for use with 2-9/16 in. wide furring channels. RSIC-1 (2.75) and RSIC-V (2.75) clips for use with 2-23/32 in. wide furring channels. Adjoining channels are overlapped as described in Item a. As an alternate, ends of adjoining channels may be overlapped 6 in. and secured together with two self-tapping No. 6 framing screws, min. 7/16 in. long at the midpoint of the overlap, with one screw on each flange of the channel. Additional clips required to hold furring channel that supports the wallboard butt joints, as described in Item 5.
PAC INTERNATIONAL L L C — Types RSIC-1, RSIC-V, RSIC-1 (2.75), RSIC-V (2.75)

4C. **Alternate Steel Framing Members* —** (Not Shown) — As an alternate to Items 4, 4A, 4B furring channels and Steel Framing Members as described below.
a. **Furring Channels —** Formed of No. 25 MSG galv steel. 2-3/8 in. wide by 7/8 in. deep, spaced 24 in. OC, perpendicular to joists. When insulation, Items 3, 3A, or 3B is used, the furring channel spacing shall be reduced as described in Item 4. Channels secured to joists as described in Item b. Ends of adjoining channels overlapped 6 in. and tied together with double strand of No. 18 SWG galv steel wire near each end of overlap.

b. **Steel Framing Members* —** Used to attach furring channels (Item a) to the wood joists (Item 2). When wood joists are spaced 19.2 in. OC, clips spaced a max of 38.4 in. OC. When wood joists are spaced 16 or 24 in. OC, clips spaced a max of 48 in. OC. Genie Clips secured to alternating joists with No. 8 x 2-1/2 in. coarse drywall screw through the center hole. Furring channels are friction fitted into clips. Additional clips required to hold furring channel that supports the wallboard butt joints, as described in Item 5.
PLITEQ INC — Type Genie Clip

4D. **Alternate Steel Framing Members* —** (Not Shown) — As an alternate to items 4-4B, furring channels and Steel Framing Members as described below.
a. **Furring Channels —** Formed of No. 25 MSG galv steel, 2-5/8 in. wide by 7/8 in deep, spaced 24 in OC, perpendicular to joists. When insulation, Items 3, 3A, or 3B is used, the furring channel spacing shall be reduced as described in Item 4. Channels secured to joists as described in Item b.

b. **Steel Framing Members* —** Used to attach furring channels (Item a) to the wood joists (Item 2). When wood joists are spaced 19.2 in. OC, clips spaced a max of 38.4 in. OC. When wood joists are spaced 16 or 24 in. OC, clips spaced at 48" OC and secured to the bottom of the joists with one 2 in. Coarse Drywall Screw with 1 in. diam washer through the center hole. Furring channels are then friction fitted into clips. Ends of channels are overlapped 6" and tied together with double strand of No. 18 AWG galvanized steel wire.Additional clips are required to hold the Gypsum Butt joints as described in item 5.
STUDCO BUILDING SYSTEMS — RESILMOUNT Sound Isolation Clips - Type A237 or A237R

4E. **Alternate Steel Framing Members* —** As an alternate to items 4-4D, furring channels and Steel Framing Members as described below.
a. **Furring Channels —** Formed of No. 25 MSG galv steel, 2-1/2 in. wide by 7/8 in deep, spaced 24 in OC, perpendicular to joists. When insulation, Items 3, 3A, or 3B is used, the furring channel spacing shall be reduced as described in Item 4. Channels secured to joists as described in Item b.

b. **Steel Framing Members* —** Used to attach furring channels (Item a) to the wood joists (Item 2). When wood joists are spaced 19.2 in. OC, clips spaced a max of 38.4 in. OC. When wood joists are spaced 16 or 24 in. OC, clips spaced at 48" OC and secured to the bottom of the joists with one 2-1/2 in. Coarse Drywall Screw with 1 in. diam washer through the center hole. Furring channels are then friction fitted into clips. Ends of channels are overlapped 6" and tied together with double strand of No. 18 AWG galvanized steel wire. Additional clips are required to hold the Gypsum Butt joints as described in item 5.
REGUPOL AMERICA — Type SonusClip

4F. **Steel Framing Members* —** (Optional, Not Shown) — As an alternate to Item 4.
a. **Furring Channels —** Formed of No. 25 MSG galv steel, nominal 2-1/2 in. wide by 7/8 in. deep, spaced as indicated in Item 4, perpendicular to the joists. Channels secured to Cold Rolled Channels at every intersection with a 3/4 in. TEK screw through each furring channel leg. Ends of adjoining channels overlapped 12 in. and fastened together with two double strand No. 18 SWG galv steel wire ties, one at each end of overlap, or with two 3/4 in. TEK screws in each leg of the overlap section. Two furring channels positioned 3 in. OC, 1-1/2 in. on each side of gypsum board (Item 5) end joints, each extending a min of 6 in. beyond both side edges of the board.

b. **Cold Rolled Channels —** 1-1/2 in. by 1/2 in., formed from No. 16 ga. galv steel, positioned vertically and parallel to joists, friction-fitted into the channel caddy on the Steel Framing Members (Item 4Fc) and secured with two 3/4 in. TEK screws. Adjoining lengths of cold rolled channels lapped min. 12 in. and secured along bottom legs with four 3/4 in. TEK screws and wire-tied together with two double strand 18 SWG galv steel wire ties, one at each end of overlap.

c. **Steel Framing Members* —** Spaced 48 in. OC. max along joist, and secured to the joist on alternating joists with two, #10 x 1-1/2 in. screws through mounting holes on the hanger bracket.
PAC INTERNATIONAL L L C — Type RSIC-SI-CRC EZ Clip

4G. **Steel Framing Members* —** (Optional, Not Shown) — As an alternate to Item 4.
a. **Furring Channels —** Formed of No. 25 MSG galv steel, nominal 2-1/2 in. wide by 7/8 in. deep, spaced as indicated in Item 4, perpendicular to joists and friction fit into Steel Framing Members (Item 4Gb). Ends of adjoining channels overlapped 6 in. and tied together with double strand of No. 18 SWG galv steel wire near each end of overlap or with two TEK screws along each leg of the 6 in. overlap. Two furring channels positioned 6 in. OC, 3 in. on each side of gypsum board (Item 5) end joints. Butt joint channels held in place by strong back channels placed upside down, on top of, and running perpendicular to primary furring channels, extending 6 in. longer than length of gypsum side joint. Strong back channels spaced maximum 48 in. OC. Strong back channels secured to every intersection of primary furring channels with four 7/16 in. pan head screws, two along each of the legs at intersections. Butt joint channels run perpendicular to strong back channels and shall be minimum 6 in. longer than length of joint, secured to strong back channels with 7/16 in. pan head screws, two along each of the legs at intersection with strong back channels.

b. **Steel Framing Members* —** Used to attach furring channels (Item 4Ga) to joists. Clips spaced 48 in. OC and secured along joist webs at each furring channel intersection with min. 3/4 in. long self-drilling #10 x 1-1/2 in. screws through each of the provided hole locations. Furring channels are friction fitted into clips.
PAC INTERNATIONAL L L C — Type RSIC-S1-1 Ultra

4H. **Steel Framing Members* —** (Optional, Not Shown) — As an alternate to Item 4 - Nom 12 ft (3.66 m) long main runners installed perpendicular to wood trusses and spaced 48 in. (1.22 m) OC. Main runners suspended from trusses with No. 12 SWG galv steel hanger wires reliably secured to the bottom chords of the trusses with screw-attached steel clips and spaced max 48 in. (1.22 m) OC. Nom 4 ft (1.22 m) long cross tees with 1-1/2 in. (38 mm) wide face installed perpendicular to main runners and spaced max 16 in. (406 mm) OC. Cross tees located 4 in. (102 mm) from each side of butted gypsum board end joints. Ends of steel framing members at walls to be supported by galv or painted steel angles or channels with min 1 in. (25 mm) horizontal leg.
ARMSTRONG WORLD INDUSTRIES INC — Type DFR-8000

4I. **Alternate Steel Framing Members* —** (Optional, Not Shown) — As an alternate to Item 4 - For use in corridors or rooms having a maximum width dimension of 14 ft (4.25 m). Steel framing members consist of grid runners, locking angle wall molding and hanger bars. Locking angle wall molding secured to walls with steel nails or screws spaced max 16 in. (610 mm) OC. Slots of locking angle wall molding parallel with hanger bars to be aligned with tabbed cutouts in bottom edge of hanger bars. Hanger bars spaced max 50 in. (1.22 m) OC and suspended with No. 12 AWG steel hanger wires spaced max 48 in. (1.22 m) OC. Adjoining lengths of hanger bar to overlap 12 in. (305 mm) and to be secured together and suspended by a shared hanger wire. A min clearance of 1/4 in. (6 mm) shall be maintained between the ends of the hanger bars and the walls. Grid runners cut-to-length and installed perpendicular to hanger bars and spaced max 16 in. (406 mm) OC with additional grid runners installed 8 in. (203 mm) OC at gypsum board end joints. Grid runners parallel with walls to be spaced max 16 in. (406 mm) from wall. Ends of grid runners to rest on and engage slots of locking angle wall molding with a clearance of 3/8 in. (10 mm) to 1/2 in. (13 mm) maintained between each end of the grid runner and the wall. Bulb of grid runner to be captured by tabbed cutouts in bottom edge of hanger bars.
ARMSTRONG WORLD INDUSTRIES INC — Type DFR-8000-SS

4J. **Alternate Steel Framing Members* —** (Nom Shown) — As an alternate to Item 4H - Main runners nom 12 ft (3.66 m) long, spaced 72 in. (1.83 m) OC. Cross tees, nom 6 ft (1.83 m) long, installed perpendicular to main runners and spaced 16 in. (406 mm) OC. Additional 6 ft long cross tees required at each gypsum board end joint with butted gypsum board end joints centered between cross tees spaced 8 in. (203 mm) OC. The main runners and cross tees may be riveted or screw-attached to the wall angle or channel to facilitate the ceiling installation.
ARMSTRONG WORLD INDUSTRIES INC — Type DFR-8000

4K. **Steel Framing Members* —** Optional - Not Shown) — Used to attach resilient channels (Item 6) to joists (Item 2). Clips spaced 48 in. OC and secured to joists with one No. 8 x 2-1/2 in. coarse drywall screw through center grommet hole. Channels secured to clips with one #10 x 1/2 in. pan-head self-drilling screw. Ends of adjoining channels overlapped 6 in. and secured together with two #8 15 x 1/2 in. Philips Modified screws spaced 2-1/2 in. from the center of the overlap. Gypsum board butt joints require additional resilient channels spaced 1-1/2 in. from the butt joint on either side. One edge of the extra channels will extend to an adjacent joist where it is secured with a clip.
KEENE BUILDING PRODUCTS CO INC — Type RC+ Assurance Clip

4L. **Steel Framing Members* —** (Optional, Not Shown) — Used as an alternate method to attach resilient channels to structural members. A resilient sound isolation accessory shall be used at each attachment point of the resilient channels and spaced max 19.2 in. O.C. Channel ends butted and centered under the structural members and attached with one accessory at each end. Additional accessories used to hold resilient channels that support the gypsum board end joints. The accessory envelops the mounting edge of the resilient channel. The accessory and resilient channel are fastened to the structural members with the screws supplied with the accessory and per the accessory manufacturer's installation instructions. Gypsum Board butt joints staggered minimum 24 in. OC and Gypsum Board screws spaced 8 in. OC when used.
PAC INTERNATIONAL L L C — Type RC-1 Boost

4M. **Steel Framing Members* —** (Optional, Not Shown, As an alternate to Item 4) — Furring channels and Steel Framing Members as described below:

a. **Furring Channels —** Formed of No. 25 MSG galv steel. 2-23/32 in. wide by 7/8 in. or 1-1/2 in. deep, spaced 24 in. OC perpendicular to joists. Channels secured to joists as described in Item 4Mb. Ends of adjoining channels are overlapped 6 in. and tied together with double strand of No. 18 SWG galv steel wire near each end of overlap. As an alternate, ends of adjoining channels may be overlapped 6 in. and secured together with two self-tapping #6 framing screws, min. 7/16 in. long at the midpoint of the overlap, with one screw on each flange of the channel. Additional clips required to hold furring channel that supports the wallboard butt joints, as described in Item 5.

b. **Steel Framing Members* —** Used to attach furring channels (Item 4Ma) to joists (Item 2). Clips spaced 48 in. OC with No. 8 x 2-1/2 in. coarse drywall screw through the center grommet. Furring channels are friction fitted into clips.

CLARKDIETRICH BUILDING SYSTEMS — Type ClarkDietrich Sound Clips

5. **Gypsum Board* —** Two layers of 1/2 in. or 5/8 in. thick by 4 ft wide gypsum panels, installed perpendicular to resilient channels (Item 4). The base layer of panels screw-attached to the resilient channels with 1 in. long Type S screws spaced 8 in. OC at the butt joints and 16 in. OC in the field of the panel. The face layer screw-attached to the resilient channels with 1-5/8 in. Type S screws spaced 8 in. OC and 1-1/2 in. Type G screws spaced 8 in. OC at the butt joints located mid-span between resilient channels.

When **Steel Framing Members** (Item 4A) are used, gypsum board installed with long dimension perpendicular to cross tees. The base layer of panels fastened to cross tees with 1 in. long Type S screws spaced 8 in. OC at the butt joints and 16 in. OC in the field of the panel. The face layer screw-attached to the cross tees with 1-5/8 in. Type S screws spaced 8 in. OC and 1-1/2 in. Type G screws spaced 8 in. OC at the butt joints located mid-span between cross tees. Screws along sides and ends of panels spaced 3/8 to 1/2 in. from panel edge. End joints of panels shall be staggered with spacing between joints on adjacent panels not less than 4 ft OC.

When **Steel Framing Members** (Items 4B and 4M) are used, panels installed with long dimension parallel with joists. Base layer attached to the furring channels using 1 in. long Type S bugle-head steel screws spaced 8 in. OC along butted end joints and 12 in. OC in the field of the panels. Butted end joints shall be staggered min. 2 ft. within the assembly, and occur midway between the continuous furring channels. Each end of the gypsum panels shall be supported by a single length of furring channel equal to the width of the panel plus 6 in. on each end. The furring channels shall be spaced approximately 3-1/2 in. OC, and be attached to underside of the joist with one RSIC-1 clip at each end of the channel. Butted base layer end joints to be offset a minimum of 24 in. in adjacent courses. Outer layer attached to the furring channels using 1-5/8 in. long Type S bugle-head steel screws spaced 8 in. OC at butted joints and 12 in. OC in the field. Butted end joints to be offset min 12 in. from base layer end joints. Butted side joints of outer layer to be offset min 12 in. from butted side joints of base layer.

When **Steel Framing Members** (Item 4C) are used, panels installed with long dimension parallel with joists. Base layer attached to the furring channels using 1 in. long Type S bugle-head steel screws spaced 8 in. OC along butted end joints and 12 in. OC in the field of the panels. Butted end joints shall be staggered min. 2 ft. within the assembly, and occur midway between the continuous furring channels. Each end of the gypsum panels shall be supported by a single length of furring channel equal to the width of the panel plus 6 in. on each end. The furring channels shall be spaced approximately 3-1/2 in. OC, and be attached to underside of the joist with one Genie clip at each end of the channel. Butted base layer end joints to be offset a minimum of 24 in. in adjacent courses. Outer layer attached to the furring channels using 1-5/8 in. long Type S bugle-head steel screws spaced 8 in. OC at butted joints and 12 in. OC in the field. Butted end joints to be offset min 12 in. from base layer end joints. Butted side joints of outer layer to be offset min 12 in. from butted side joints of base layer.

When **Steel Framing Members** (Item 4D) are used, base layer gypsum board is installed with long dimensions perpendicular to furring channels. Gypsum board secured to furring channels with nom 1 in. long Type S bugle-head steel screws spaced 8 in. OC in the field of the board. Gypsum board butted end joints shall be staggered minimum 48 in. and centered over main furring channels. At the gypsum board butt joints, each end of each gypsum board shall be supported by a single length of furring channel equal to the width of the gypsum board plus 3 in. on each end. The two support furring channels shall be spaced approximately 3 in. in from joint. Screw spacing along the gypsum board butt joint and along both additional channels shall be 8 in. OC. Butt joint furring channels shall be attached with one RESILMOUNT Sound Isolation Clip at each end of the channel. Face layer secured as described above.
When **Steel Framing Members** (Item 4E) are used, base layer gypsum board is installed with long dimensions perpendicular to furring channels. Gypsum board secured to furring channels with nom 1 in. long Type S bugle-head steel screws spaced 8 in. OC in the field of the board. Gypsum board butted end joints shall be staggered minimum 48 in. and centered over main furring channels. At the gypsum board butt joints, an additional single length of furring channel shall be installed and be spaced approximately 3 in. from the butt joint (6 in. from the continuous furring channels) to support the floating end of the gypsum board. Each of these shorter sections of furring channel shall extend one joist beyond the width of the gypsum panel and be attached to the adjacent joists with one SonusClip at every joist involved with the butt joint.

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

UL L570 (CONT'D)

AG019

PLOT DATE: 3/28/2022 3:03:02 PM

COPYRIGHT©

When **Steel Framing Members** (Item 4F) are used, Two layers of 1/2 in. or 5/8 in. thick, 4 ft wide gypsum board, installed as described in Item 5. Adjacent butt joints staggered minimum 48 in. OC.

When **Steel Framing Members** (Item 4G) are used, Two layers of 1/2 in. or 5/8 in. thick, 4 ft wide gypsum board, installed as described in Item 5. Butt joints staggered minimum 24 in. OC.

When **Steel Framing Members*** (Item 4H) are used, base layer gypsum board installed with long dimension perpendicular to cross tees with side joints centered along main runners and end joints centered along cross tees. Gypsum board secured to cross tees with 1 in. long Type S bugle head screws spaced 12 in. OC in the field and 8 in. OC along end joints. Gypsum board also secured to main runners with 1 in. long Type S bugle head screws midway between cross tees. Screws along sides and ends of boards spaced 3/4 to 1/2 in. from board edge. End joints of the sheets shall be staggered with spacing between joints on adjacent boards not less than 4 ft OC. The face layer screw-attached to the cross tees with 1-5/8 in. Type S screws spaced 8 in. OC and 1-1/2 in. Type G screws spaced 8 in. OC at the butt joints. Screws along sides and ends of panels spaced 3/8 to 1/2 in. from panel edge. End joints of panels shall be staggered with spacing between joints on adjacent panels not less than 4 ft OC.

When alternate **Steel Framing Members*** (Item 4I) are used, base layer gypsum board sheets installed with long dimension (side joints) perpendicular to the grid runners with the end joints staggered min 4 ft and centered between grid runners which are spaced 8 in. OC. Prior to installation of the gypsum board sheets, backer strips consisting of nom 7-3/4 in. wide by 48 in. long pieces of gypsum board are to be laid atop the grid runner flanges and centered over each butted end joint location. The backer strips are to be secured to the flanges of the grid runners at opposite corners of the backer strip to prevent the backer strips from being uplifted during screw-attachment of the gypsum board sheets. Gypsum board fastened to grid runners with drywall screws spaced 1 in. and 4 in. from the side joints and max 8 in. OC in the field of the board. The butted end joints are to be secured to the backer strip with No. 10 by 1-1/2 in. long Type G laminating screws located 1 in. from each side of the butted end joint and spaced 1 in. and 4 in. from the side joints and max 8 in. OC in the field of the board. The face layer screw-attached to the grid runners with 1-5/8 in. Type S screws spaced 8 in. OC and 1-1/2 in. Type G screws spaced 8 in. OC at butt joints. Screws along sides and ends of panels spaced 3/8 to 1/2 in. from panel edge. End joints of panels shall be staggered with spacing between joints on adjacent panels not less than 4 ft OC.

When alternate **Steel Framing Members*** (Item 4J) are used, base layer gypsum board sheets installed with long dimension (side joints) perpendicular to the 6 ft long cross tees with the end joints staggered min 4 ft and centered between cross tees which are spaced 8 in. OC. Gypsum board side joints may occur beneath or between main runners. Prior to installation of the gypsum board sheets, backer strips consisting of nom 7-3/4 in. wide pieces of gypsum board are to be laid atop the cross tee flanges and centered over each butted end joint location. The backer strips are to be secured to the flanges of the cross tees at opposite corners of the backer strip to prevent the backer strips from being uplifted during screw-attachment of the gypsum board sheets. Gypsum board fastened to cross tees with drywall screws spaced 1 in. and 4 in. from the side joints and max 8 in. OC in the field of the board. The butted end joints are to be secured to the backer strip with No. 10 by 1-1/2 in. long Type G laminating screws located 1 in. from each side of the butted end joint and spaced 1 in. and 4 in. from the side joints and max 8 in. OC in the field of the board. The face layer screw-attached to the cross tees with 1-5/8 in. Type S screws spaced 8 in. OC and 1-1/2 in. Type G screws spaced 8 in. OC at the butt joints. Screws along sides and ends of panels spaced 3/8 to 1/2 in. from panel edge. End joints of panels shall be staggered with spacing between joints on adjacent panels not less than 4 ft OC.

CGC INC — 1/2 in. Type C, IP-X2, IPC-AR; 5/8 in. Type C, IP-X2, ULIX. When there is no insulation in the cavity, or when insulation (Item 3) is secured to the underside of the subfloor 5/8 in. Type SCX or IP-X1 may be used

UNITED STATES GYPSUM CO — 1/2 in. Type C, IP-X2, IPC-AR; 5/8 in. Type C, IP-X2, ULIX. When there is no insulation in the cavity, or when insulation (Item 3) is secured to the underside of the subfloor 5/8 in. Type SCX, or IP-X1 may be used

USG BORAL DRYWALL SFZ LLC — 1/2 in. Type C; 5/8 in. Type C. When there is no insulation in the cavity, or when insulation (Item 3) is secured to the underside of the subfloor 5/8 in. Type SCX may be used

6. **Finishing System —** Fiber tape embedded in compound over joints and exposed nail heads, covered with compound with edges of compound feathered out. As an alternate, nom 3/32 in. thick gypsum veneer plaster may be applied to the entire surface of classified veneer baseboard. Joints reinforced.

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

Last Updated on 2021-08-27

The appearance of a company's name or product in this database does not in itself assure that products so identified have been manufactured under UL's Follow-Up Service. Only those products bearing the UL Mark should be considered to be Certified and covered under UL's Follow-Up Service. Always look for the Mark on the product.

UL permits the reproduction of the material contained in the Online Certification Directory subject to the following conditions: 1. The Guide Information, Assemblies, Constructions, Designs, Systems, and/or Certifications (files) must be presented in their entirety and in a non-misleading manner, without any manipulation of the data (or drawings). 2. The statement "Reprinted from the Online Certifications Directory with permission from UL" must appear adjacent to the extracted material. In addition, the reprinted material must include a copyright notice in the following format: "© 2021 UL LLC"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

UL L570 (CONT'D)

AG020

COPYRIGHT©

PLOT DATE: 3/28/2022 3:03:03 PM

UL Product iQ™

BXUV.P531

Design/System/Construction/Assembly Usage Disclaimer

- Authorities Having Jurisdiction should be consulted in all cases as to the particular requirements covering the installation and use of UL Certified products, equipment, system, devices, and materials.
- Authorities Having Jurisdiction should be consulted before construction.
- Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with applicable requirements. The published information cannot always address every construction nuance encountered in the field.
- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.
- Only products which bear UL's Mark are considered Certified.

BXUV - Fire Resistance Ratings - ANSI/UL 263 Certified for United States
BXUV7 - Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada

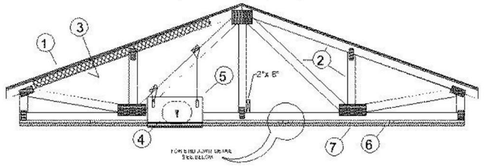
See General Information for Fire-resistance Ratings - ANSI/UL 263 Certified for United States
Design Criteria and Allowable Variances

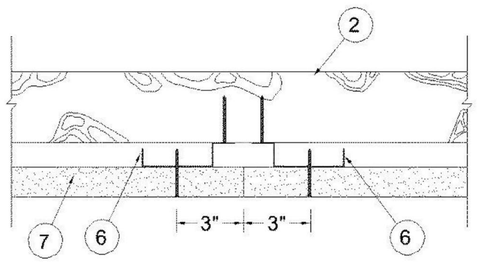
See General Information for Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada
Design Criteria and Allowable Variances

Design No. P531

Unrestrained Assembly Rating - 1 Hr.
Finish Rating - 25 Min. (See Items 3 or 3A and 7), 20 Min. (See Items 3B and 7A)
This design was evaluated using a load design method other than the Limit States Design Method (e.g., Working Stress Design Method). For jurisdictions employing the Limit States Design Method, such as Canada, a load restriction factor shall be used — See Guide BXUV or BXUV7

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**





1. **Roofing System* —** Any UL Class A, B or C Roofing System **(TGFU)** or Prepared Roof Covering **(TFWZ)** acceptable for use over nom 15/32 in. thick wood structural panels, min. grade "C-D" or "Sheathing". Nom 15/32 in. thick wood structural panels secured to trusses with construction adhesive and No. 6d ringed shank nails. Nails spaced 12 in. OC along each truss. Staples having equal or greater withdrawal and lateral resistance strength may be substituted for the 6d nails.

2. **Trusses —** Pitch or Parallel chord trusses, spaced a max of 24 in. OC, fabricated from nom 2 by 4 lumber, with lumber oriented vertically or horizontally. Truss members secured together min.0.0356 in. thick galv steel plates. Plates have 5/16 in. long teeth projecting perpendicular to the plane of the plate. The teeth are in pairs facing each other (made by the same punch), forming a split tooth type plate. Each tooth has a chisel point on its outside edge. These points are diagonally opposite each other for each pair. The top half of each tooth has a twist for stiffness. The pairs are repeated on approximately 7/8 in. centers with four rows of teeth per inch of plate width. Where the truss intersects with the interior face of the exterior walls, the min truss depth shall be 5-1/4 in. with a min roof slope of 3/12 and a min. area in the plane of the truss of 21 sq/ft. Where the truss intersects with the interior face of the exterior walls, the min truss depth may be reduced to 3 in. if the batts and blankets (Item 3) are used as shown in the above illustration (Alternate Insulation Placement) and are firmly packed against the intersection of the bottom chords and the plywood sheathing.

3. **Batts and Blankets* —** (Optional) -Glass fiber insulation, secured to the wood structural panesl with staples spaced 12 in. OC or to the trusses with 0.090 in. diam galv steel wires spaced 12 in. OC. Any glass fiber insulation bearing the UL Classification Marking as to Surface Burning Characteristics and/or Fire Resistance, having a min density of 0.5 pcf. As an option, the insulation may be fitted in the concealed space, draped over the resilient channel/gypsum wallboard ceiling membrane when resilient channels and gypsum wallboard attachment is modified as specified in Items 6 and 7. The finished rating has only been determined when the insulation is secured to the decking.

3A. **Cavity Insulation - Loose Fill Material* —** (Not Shown) As an alternate to Item 3 — Any thickness of loose fill material bearing the UL Classification Marking for Surface Burning Characteristics, having a min density of 0.5 pcf, fitted in the concealed space, draped over the resilient channel/gypsum wallboard ceiling membrane when resilient channels and gypsum wallboard attachment is modified as specified in Items 6 and 7. The finished rating when loose fill material is used has not been determined.

3B. **Cavity Insulation - Batts and Blankets* or Loose Fill Material* —** (Not Shown) (As described above in Items 3 and 3A) — For Use with Item 7A — Min. 3-1/2 in thick with no limit on maximum thickness fitted in the concealed space, draped over the resilient channel (Item 6A)/gypsum board (Item 7A) ceiling membrane.

3C. **Foamed Plastic* —** (As alternate to Item 3, 3A, 3B, Not Shown) — Spray foam insulation applied directly to the underside of the plywood roofing system (Item 1). Spray foam insulation installed to a maximum thickness of 10 in. at a nominal 0.5 lb/ft^3 or 2.0 lb/ft^3 density, depending on the product installed. When spray foam insulation is installed, resilient channels (Item 6) shall be installed maximum 12 in. OC, with channels adjacent to butt joints of gypsum board (Item 7) spaced maximum 3 in. away from gypsum butt joints. Gypsum board (Item 7) to be installed using minimum 1-1/4 in. long Type S screws, spaced maximum 8 in. OC, and butted end joints shall be staggered min. 2 ft within the assembly, and occur midway between the continuous furring channels. If used with a fire damper (Item 5) in the concealed space, minimum 1 in. clearance to be maintained between damper housing and spray foam insulation. Not evaluated for use with Items 3 through 3B, 6A, 9, or 9A.
BASF CORP — Enertite® NM, Enertite® G, FE178®, Spraytite® 178, Spraytite® 81206, Walltite® 200, Walltite® US, Walltite® US-N, and Walltite® HP+

3C. **Fiber, Sprayed* —** As an alternate to Item 3 — Any thickness of spray-applied cellulose insulation material, having a min density of 0.5 lb/ft^3, applied with water, over the resilient channel/gypsum board ceiling membrane when resilient channels and gypsum board attachment is modified as specified in Items 6 and 7. Fiber, Sprayed is applied with moisture in accordance with the application instructions supplied with the product. The finish rating when Fiber Sprayed is used has not been determined. Alternate application method: The fiber is applied without water or adhesive in accordance with the application instructions supplied with a minimum density of 0.5 lb/ft^3 over the resilient channel/gypsum board ceiling membrane when resilient channels and gypsum board attachment is modified as specified in Items 6 and 7. Alternate application method: The fiber is applied without water or adhesive to a nominal density of 3.5 lb/ft^3 behind netting (Item 12) stapled to the rafters. The netting is stapled at both lower edges of the rafters creating a cavity to accept the cellulose fiber.
U S GREENFIBER L L C — INS735, INS745, INS750LD, and SANCTUARY for use with wet or dry applications. INS515LD, INS541LD, INS765LD for dry application only.

3D. **Foamed Plastic* —** (As alternate to Items 3, 3A, 3B, or 3C Not Shown) — Spray foam insulation applied directly to the underside of the roofing system (Item 1). Spray foam insulation installed to a maximum thickness of 10 in. at a nominal 0.5 lb/ft^3 or 2.0 lb/ft^3 density, depending on the product installed. When spray foam insulation is installed, resilient channels (Item 6) shall be installed maximum 12 in. OC, with channels adjacent to butt joints of gypsum board (Item 7) spaced maximum 3 in. away from gypsum butt joints. Gypsum board (Item 7) to be installed using minimum 1-1/4 in. long Type S screws, spaced maximum 8 in. OC, and butted end joints shall be staggered min. 2 ft within the assembly, and occur midway between the continuous furring channels. If used with a fire damper (Item 5) in the concealed space, minimum 1 in. clearance to be maintained between damper housing and spray foam insulation. Not evaluated for use with Item 6A.
BASF CORP — Enertite® NM, FE178®, Spraytite® 178, Spraytite® 81206

SES FOAM INC — Sucraseal

3E. **Foamed Plastic* —** (As alternate to Item 3 - not to be used in combination with any alternates to item 3) — Spray foam insulation applied directly to the underside of the underside of the roofing system. Spray foam insulation installed to a maximum thickness of 11 in. at a nominal 1.0 lb/ft^3 - 2.5 lb/ft^3 density, while maintaining a minimum 7 in. clearance between the spray foam insulation and the gypsum board (Item 7). Spray foam insulation is limited for use with minimum 18 in. deep trusses (Item 2). When spray foam insulation is installed, resilient channels (Item 6) shall be installed maximum 12 in. OC, with channels adjacent to butt joints of gypsum board spaced maximum 3 in. away from gypsum butt joints. Gypsum board to be installed using minimum 1-1/4 in. long Type S screws, spaced maximum 8 in. OC, and butted end joints shall be staggered min. 2 ft within the assembly, and occur midway between the continuous furring channels, as illustrated above. If used with a ceiling damper (Items 5) in the concealed space, no clearance is necessary between damper housing and spray foam insulation. Only for use with item 5 not evaluated for use with alternates to item 5.
CARLISLE SPRAY FOAM INSULATION — Types SealTite Pro Closed Cell (CC), SealTite Pro Open Cell (OC), SealTite Pro OCX, SealTite Pro No Trim 21, SealTite Pro One Zero, Foamsulate Closed Cell, Foamsulate OCX, Foamsulate 70, and Foamsulate HFO.

4. **Air Duct* —** Any UL Class 0 or Class 1 flexible air duct installed in accordance with the instructions provided by the damper manufacturer.

5. **Damper* —** Max nom 20 in. long by 18 in. wide by 2-1/8 in. high, fabricated from galvanized steel. Plenum box maximum size nom. 21 in. long by 18 in. wide by 16 in. high fabricated from either galavanized steel or Classified Air Duct Materials bearing the UL Class 0 or Class 1 rigid air duct material. Installed in accordance with the instructions provided by the manufacturer. Max damper openings not to exceed 180 sq in. per 100 sq ft of ceiling area.
NAILOR INDUSTRIES INC — Types 0755, 0755A, 0756, 0756D, 0757 , 0757D, 0757FP, 0757DFP, 0758, 0759, 0760, 0761, 0762, 0763, CRD5, CRD5D, CRD6, CRD6D, CRD6FP, CRD6DFP.

SAFE AIR DOWCO — 0455, 0455A, 0456, 0456D, 0457, 0457D, 0457-DB, 0457-CB, 0463-FB, 0457-EB, 0463-GB, 0463

6. **Resilient Channels —** Resilient channels formed of 25 MSG thick galv steel, spaced 16 in. OC, installed perpendicular to trusses. When batt and blanket material, Item 3, is draped over the resilient channel/gypsum wallboard ceiling membrane, or when insulation (Item 3C) is applied to the underside of the roofing system (Item 1), the spacing shall be 12 in. OC. Channels secured to each truss with 1-1/4 in. long Type S steel screws. Channels overlapped 4 in. at splices. Channels oriented opposite at wallboard butt joints (spaced 6 in. OC) as shown in the above illustration.

6A. **Resilient Channels - (Not Shown) —** For Use With Item 7A - Formed from min 25 MSG galv steel installed perpendicular to trusses and spaced 16 in. OC. Channels secured to each truss with 1-5/8 in. long Type S bugle head steel screws. Channels overlapped 4 in. at splices. Two channels, spaced 6 in. OC, oriented opposite each gypsum panel end joint. Additional channels shall extend min 6 in. beyond each side edge of panel. Insulation, Item 3B is applied over the resilient channel/gypsum panel (Item 7A) ceiling membrane.

7. **Gypsum Board* —** Nom 5/8 in. thick, 48 in. wide, installed with long dimension perpendicular to resilient channels with 1 in. long Type S screws spaced 12 in. OC and located a min of 1/2 in. from side joints and 3 in. from the end joints. At end joints, two resilient channels are used, extending a min of 6 in. beyond both ends of the joint. When batt and blanket insulation, Item 3, is draped over the resilient channel/gypsum wallboard ceiling membrane, screws shall be installed at 8 in. OC. When insulation (Item 3C) is installed in the concealed space, spray-applied to the underside of the roofing system (Item 1), screws are spaced a max of 8 in. OC along resilient channels, fasteners are increased in length to 1-1/4 in, and gypsum board butt joints shall be staggered min. 2 ft within the assembly, and occur between the main furring channels.
CGC INC — Types C, IP-X2, IPC-AR

UNITED STATES GYPSUM CO — Types C, IP-X2, IPC-AR

USG BORAL DRYWALL SFZ LLC — Type C

7A. **Gypsum Board* - (Not Shown) —** For use with Items 3B and 6A. Nom 5/8 in. thick, 48 in. wide gypsum panels installed with long dimension perpendicular to resilient channels. Gypsum panels secured with 1 in. long Type S bugle head steel screws spaced 8 in. OC and located a min of 1/2 in. from side joints and 3 in. from the end joints. Finish Rating with this ceiling system is 20 min.
CGC INC — Type ULIX

UNITED STATES GYPSUM CO — Type ULIX

8. **Finishing System —** (Not Shown)— Vinyl, dry or premixed joint compound, applied in two coats to joints and screw-heads; paper tape, 2 in. wide, embedded in first layer of compound over all joints. As an alternate, nom 3/32 in. thick veneer plaster may be applied to the entire surface of gypsum wallboard.

9. **Steel Framing Members —** (Optional) (Not Shown) In lieu of Item 6.
a. **Main runners —** Installed perpendicular to trusses - Nom 12 ft long, 15/16 in. or 1-1/2 in. wide face, spaced 4 ft OC. Main runners hung a min of 2 in. from bottom chord of trusses with 12 SWG galv steel wire. Wires located a max of 48 in. OC.

b. **Cross tees or channels —** Nom 4 ft long, 15/16 in. or 1-1/2 in. wide face or cross channels, nom 4 ft long, 1-1/2 wide face, installed perpendicular to the main runners, spaced 16 in. OC. Additional cross tees or channels used at 8 in. from each side of butted wallboard end joints. The cross tees or channels may be riveted or screw-attached to the wall angle or channel to facilitate the ceiling installation.

c. **Wall angles or channels —** Used to support steel framing member ends and for screw-attachment of the gypsum wallboard - Painted or galv steel angles with 1 in. legs or channels with 1 in. legs and 1-9/16 in. deep, attached to walls at perimeter of ceiling with fasteners 16 in. OC.
CGC INC — Type DGL or RX.

USG INTERIORS LLC — Type DGL or RX.

9A. **Alternate Steel Framing Members* —** (Not Shown) - As an alternate to Item 9 - Not for use with Items 3 or 3A - Main runners nom 12 ft long, spaced 72 in. OC. Main runners suspended by min 12 SWG galv steel hanger wires spaced 48 in. OC. Cross tees, nom 6 ft long, installed perpendicular to main runners and spaced 24 in. OC. Additional 6 ft long cross tees required at each gypsum board end joint with butted gypsum board end joints centered between cross tees spaced 8 in. OC. The main runners and cross tees may be riveted or screw attached to the wall angle or channel to facilitate the ceiling installation.
USG INTERIORS LLC — Type DGL or RX

10. **Gypsum Board* —** For use with **Steel Framing Members*** (Item 9) when **Batts and Blankets*** (Item 3) are not used- One layer of nom 5/8 in. thick by 48 in. wide boards, installed with long dimension parallel to the main runners. Wallboard fastened to each cross tee or channel with five wallboard screws, with one screw located at the midspan of the cross tee or channel, one screw located 12 in. from and on each side of the cross tee or channel mid span and one screw located 1-1/2 in. from each wallboard side joint. Except at wallboard end joints, wallboard screws shall be located on alternating sides of cross tee flange. At wallboard end joints, wallboard screws shall be located 1/2 in. from the joint. Wallboard fastened to main runners with wallboard screws 1/2 in. from side joints, midway between intersections with cross tees or channels (16 in. OC). End joints of adjacent wallboard sheets shall be staggered not less than 32 in. Wallboard sheets screw attached to leg of wall angle with wallboard screws spaced 12 in. OC. Joints treated as described in Item 7. For use with **Steel Framing Members*** (Item 9) when **Batts and Blankets*** (Item 3) are used - Ratings limited to 1 Hour - 5/8 in. thick, 4 ft wide; installed with long dimension perpendicular to cross tees with side joints centered along main runners and end joints centered along cross tees. Fastened to cross tees with 1 in. long steel wallboard screws spaced 8 in. OC in the field and 8 in. OC along end joints. Fastened to main runners with 1 in. long wallboard screws spaced midway between cross tees. Screws along sides and ends of boards spaced 3/8 to 1/2 in. from board edge. End joints of the sheets shall be staggered with spacing between joints on adjacent boards not less than 4 ft OC.
CGC INC — Types C, IP-X2, IPC-AR.

UNITED STATES GYPSUM CO — Types C, IP-X2, IPC-AR.

USG BORAL DRYWALL SFZ LLC — Type C

USG MEXICO S A DE C V — Types C, IP-X2, IPC-AR.

11. **Gypsum Board* —** For use with **Steel Framing Members*** (Item 9A) - One layer of nom 5/8 in. thick by 48 in. wide boards, installed with long dimension (side joints) perpendicular to the 6 ft long cross tees with the end joints staggered min 4 ft and centered between cross tees which are spaced 8 in. OC. Gypsum board side joints may occur beneath or between main runners. Prior to installation of the gypsum board sheets, backer strips consisting of nom 7-3/4 in. wide pieces of gypsum board are to be laid atop the cross tee flanges and centered over each butted end joint location. The backer strips are to be secured to the flanges of the cross tees at opposite corners of the backer strip with hold down clips to prevent the backer strips from being uplifted during screw-attachment of the gypsum board sheets. Gypsum board fastened to cross tees with 1 in. drywall screws spaced 1 in. and 4 in. from the side joints and max 8 in. OC in the field of the board. The butted end joints are to be secured to the backer strip with No. 10 by 1-1/2 in. long Type G laminating screws located 1 in. from each side of the butted end joint and spaced 1 in. and 4 in. from the side joints and max 8 in. OC in the field of the board.
CGC INC — Types C, IP-X2, IPC-AR.

UNITED STATES GYPSUM CO — Types C, IP-X2, IPC-AR.

USG BORAL DRYWALL SFZ LLC — Type C

USG MEXICO S A DE C V — Types C, IP-X2, IPC-AR.

12. **Netting —** (Not Shown) Fibrous, woven netting material fastened to underside of each joist with staples, with side joints overlapped.

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

Last Updated on 2021-05-20

The appearance of a company's name or product in this database does not in itself assure that products so identified have been manufactured under UL's Follow-Up Service. Only those products bearing the UL Mark should be considered to be Certified and covered under UL's Follow-Up Service. Always look for the Mark on the product.

UL permits the reproduction of the material contained in the Online Certification Directory subject to the following conditions: 1. The Guide Information, Assemblies, Constructions, Designs, Systems, and/or Certifications (files) must be presented in their entirety and in a non-misleading manner, without any manipulation of the data (or drawings). 2. The statement "Reprinted from the Online Certifications Directory with permission from UL" must appear adjacent to the extracted material. In addition, the reprinted material must include a copyright notice in the following format: "© 2021 UL LLC"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

0" 1" THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

UL P531

AG021

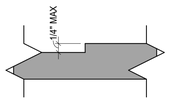
PLOT DATE: 3/28/2022 3:03:03 PM

COPYRIGHT©

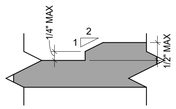
ACCESSIBILITY NOTES

1. THESE COMMONLY USED DETAILS ARE PROVIDED FOR CONVIENCE ONLY AND ARE NOT TO BE CONSTRUED AS A COMPREHENSIVE LIST OF ACCESSIBLE CONDITIONS THAT EXIST IN THE BUILDING.
2. DETAILS ARE BASED ON AND MUST MEET THE REQUIREMENTS OF ICC/ANSI 117.1 2009. IF A DISCREPANCY IS DISCOVERED, IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE ARCHITECT. DETAILS SHOWN IN ICC/ANSI 117.1 2009 TAKE PRECEDENCE OVER DETAILS SHOWN HERE AND MAY CONTAIN ADDITIONAL INFORMATION OR OPTIONS.
3. NOT ALL DETAILS SHOWN HERE ARE CONDITIONS THAT EXIST IN THE BUILDING AND NOT ALL CONDITIONS THAT EXIST IN THE BUILDING ARE DESCRIBED BY DETAILS SHOWN HERE.
4. DIMENSIONS ARE CLEAR FROM FINISH TO FINISH OR CENTERLINE OF ELEMENT UNLESS INDICATED OTHERWISE.

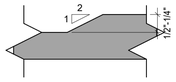
NOTE: CHANGES IN LEVEL OF MORE THAN 1/2" REQUIRE THE INCLUSION OF A RAMP



SQUARE EDGE TRANSITION



BEVELED EDGE TRANSITION

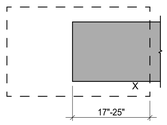


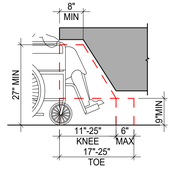
BEVELED EDGE TRANSITION

CHANGES IN LEVEL - ICC/ANSI 117.1 303

6" = 1'-0"

NOTE: WHERE SPACE BENEATH AN ELEMENT IS INCLUDED AS PART OF A CLEAR FLOOR SPACE, CLEARANCE, OR TURING SPACE AT THAT ELEMENT, KNEE AND TOE CLEARANCE UNDERNEATH THE ELEMENT SHALL BE PROVIDED

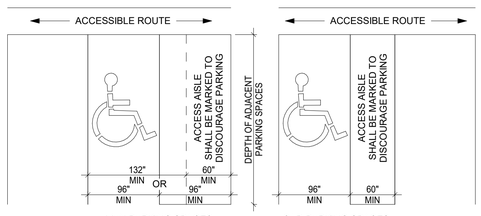




KNEE & TOE CLEARANCE - ICC/ANSI 117.1 306

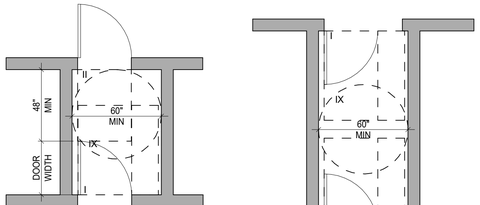
1/2" = 1'-0"

NOTE: TWO ACCESSIBLE PARKING SPACES SHALL BE PERMITTED TO SHARE A COMMON ACCESS AISLE

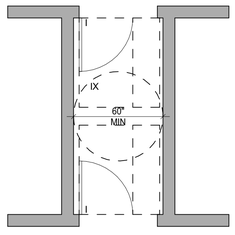


VAN PARKING SPACES CAR PARKING SPACES

ACCESSIBLE PARKING SPACES



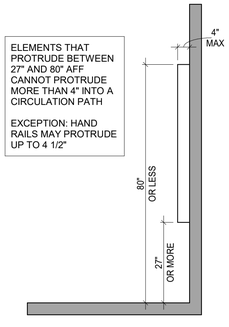
ADDITIONAL CLEARANCES FOR DOORS IN A SERIES (3)



ADDITIONAL CLEARANCES FOR DOORS IN A SERIES (2)

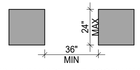
ELEMENTS THAT PROTRUDE BETWEEN 27" AND 80" AFF CANNOT PROTRUDE MORE THAN 4" INTO A CIRCULATION PATH

EXCEPTION: HAND RAILS MAY PROTRUDE UP TO 4 1/2"

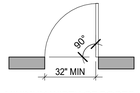


PROTRUDING OBJECTS - ICC/ANSI 117.1 307

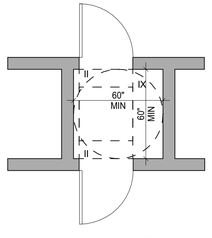
1/2" = 1'-0"



MINIMUM WIDTH OF DOORWAYS WITHOUT DOORS



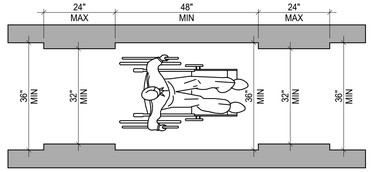
MINIMUM WIDTH OF DOORS



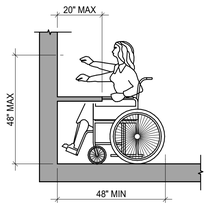
ADDITIONAL CLEARANCES FOR DOORS IN A SERIES (1)

DOORS AND DOORWAYS - ICC/ANSI 117.1 404

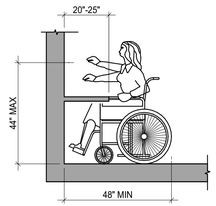
WHERE AN ACCESSIBLE ROUTE IS REQUIRED IT MUST BE AT LEAST 36" WIDE. THE ROUTE IS ALLOWED TO BE REDUCED TO 32" FOR A LENGH OF NO MORE THAN 24" WHERE TWO SUCH REDUCED SPACES ARE NO CLOSER THAN 48"

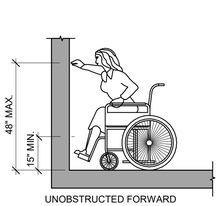


ACCESSIBLE ROUTE - ICC/ANSI 117.1 403

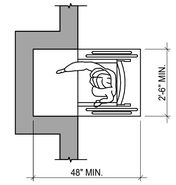


MAXIMUM FORWARD REACH OVER AN OBSTRUCTION



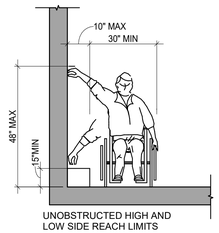


UNOBSTRUCTED FORWARD REACH

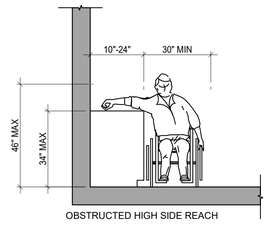


MAXIMUM FORWARD REACH OVER AN OBSTRUCTION

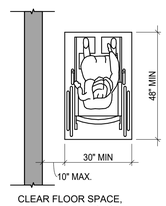
FORWARD REACH RANGES



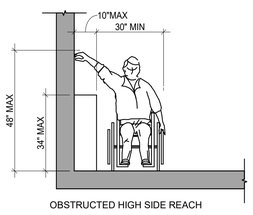
UNOBSTRUCTED HIGH AND LOW SIDE REACH LIMITS



OBSTRUCTED HIGH SIDE REACH



CLEAR FLOOR SPACE, PARALLEL APPROACH

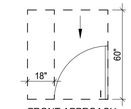


OBSTRUCTED HIGH SIDE REACH

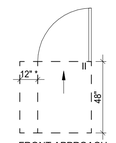
SIDE REACH RANGES

REACH RANGES - ICC/ANSI 117.1 308

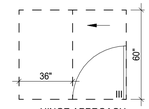
1/2" = 1'-0"



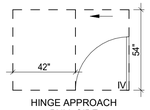
FRONT APPROACH PULL SIDE



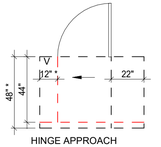
FRONT APPROACH PUSH SIDE * WITH CLOSER



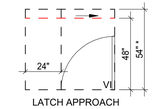
HINGE APPROACH PULL SIDE OPTION 1



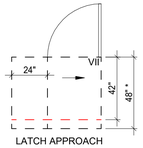
HINGE APPROACH PULL SIDE OPTION 2



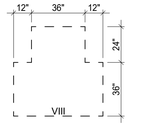
HINGE APPROACH PULL SIDE * WITH CLOSER



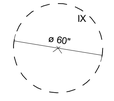
LATCH APPROACH PULL SIDE * WITH CLOSER



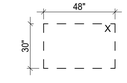
LATCH APPROACH PUSH SIDE * WITH CLOSER



TURNING SPACE T-SHAPE



TURNING SPACE CIRCLE



CLEAR FLOOR SPACE

CLEAR FLOOR SPACES, CLEARANCES, AND TURNING SPACES

1/4" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

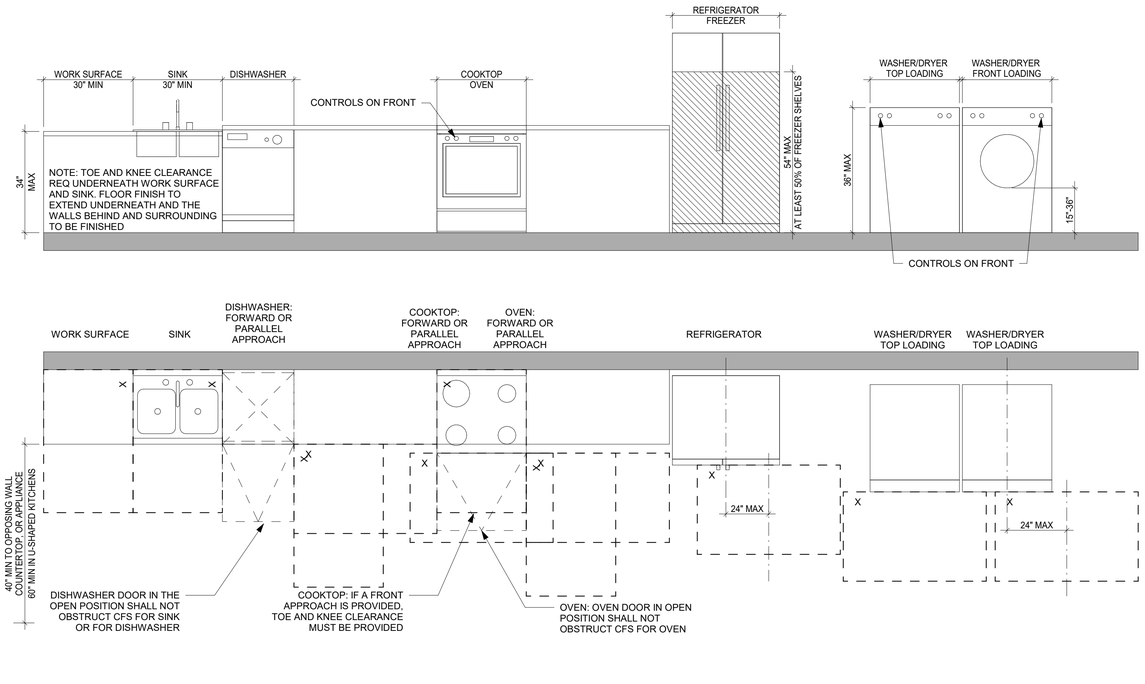
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

GENERAL ACCESSIBILITY DETAILS

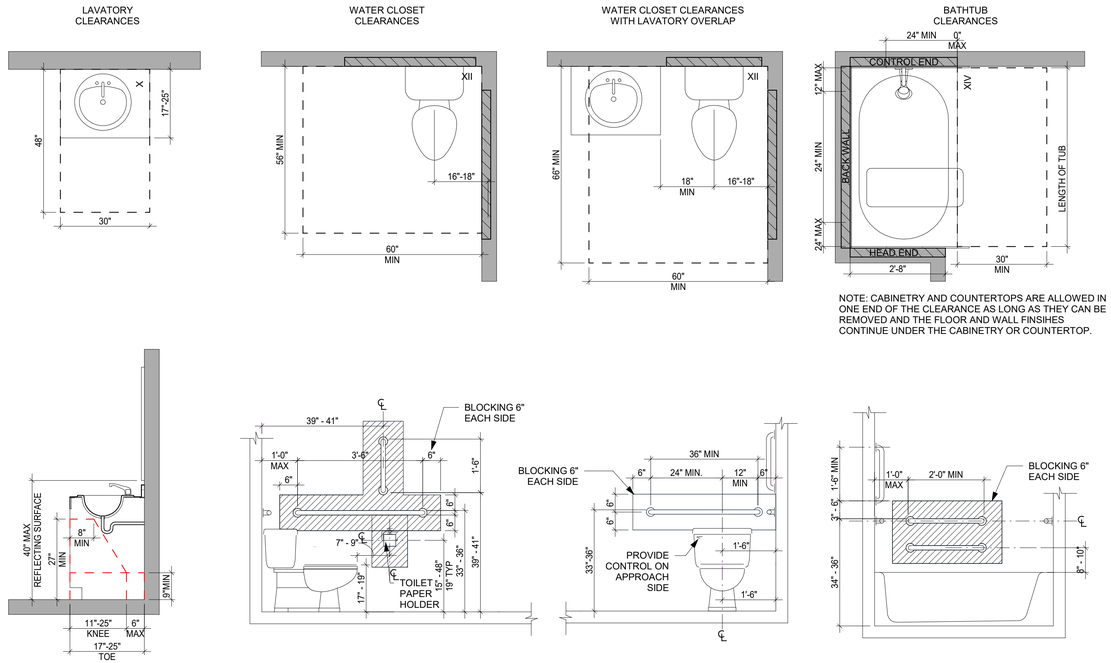
AG031

PLOT DATE: 3/28/2022 3:03:05 PM

COPYRIGHT©



TYPE A APPLIANCES - ICC/ANSI 117.1 1003.10 & 1003.12



TYPE A RESTROOM DETAILS - ICC/ANSI 117.1 1003.11

1/2" = 1'-0"

ACCESSIBILITY NOTES

1. THESE COMMONLY USED DETAILS ARE PROVIDED FOR CONVIENCE ONLY AND ARE NOT TO BE CONSTRUED AS A COMPREHENSIVE LIST OF ACCESSIBLE CONDITIONS THAT EXIST IN THE BUILDING.
2. DETAILS ARE BASED ON AND MUST MEET THE REQUIREMENTS OF ICC/ANSI 117.1 2009. IF A DISCREPANCY IS DISCOVERED, IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE ARCHITECT. DETAILS SHOWN IN ICC/ANSI 117.1 2009 TAKE PRECEDENCE OVER DETAILS SHOWN HERE AND MAY CONTAIN ADDITIONAL INFORMATION OR OPTIONS.
3. NOT ALL DETAILS SHOWN HERE ARE CONDITIONS THAT EXIST IN THE BUILDING AND NOT ALL CONDITIONS THAT EXIST IN THE BUILDING ARE DESCRIBED BY DETAILS SHOWN HERE.
4. DIMENSIONS ARE CLEAR FROM FINISH TO FINISH OR CENTERLINE OF ELEMENT UNLESS INDICATED OTHERWISE.

TYPE A ACCESSIBLE DWELLING UNIT SPECIFICATIONS:

THE PRIMARY ENTRANCE TO THE DWELLING UNIT MUST BE ON AN ACCESSIBLE ROUTE AND AT LEAST ONE ACCESSIBLE ROUTE SHALL CONNECT ALL SPACES AND ELEMENTS THAT ARE PART OF THE UNIT.

ALL ROOMS SERVED BY THE ACCESSIBLE ROUTE SHALL PROVIDE A TURNING SPACE, EXCEPT BATHROOMS THAT ARE NOT REQUIRED TO BE ACCESSIBLE AND CLOSETS OR PANTRIES THAT ARE 48" MAX IN DEPTH

ALL DOORS WITHIN THE UNIT INTENDED FOR USER PASSAGE SHALL BE ACCESSIBLE.

ALL OPERABLE PARTS FOR LIGHTING CONTROL, ELECTRICAL PANELBOARDS, ELECTRICAL OUTLETS AND SWITCHES, ENVIRONMENTAL CONTROLS, APPLIANCE CONTROLS, OPERABLE WINDOWS, PLUMBING FIXTURES, AND OTHER USER CONTROLS SHALL COMPLY WITH GENERAL ACCESSIBLE REACH REQUIREMENTS.

REINFORCEMENT FOR FUTURE INSTALLATION OF GRAB BARS AT WATER CLOSETS, BATHTUBS, AND SHOWERS AND SHOWER SEATS SHALL BE PROVIDED AT ACCESSIBLE TOILET AND BATHING FACILITIES.

DOORS SHALL NOT SWING INTO THE CLEAR FLOOR SPACE FOR ANY FIXTURE IN AN ACCESSIBLE TOILET OR BATHING FACILITY EXCEPT WHERE AN ADDITIONAL 30"X48" CLEAR FLOOR SPACE IS PROVIDED WITHIN THE ROOM BEYOND THE ARC OF THE DOOR.

CABINETRY SHALL NOT BE ALLOWED UNDER THE LAVATORY IN ACCESSIBLE TOILET AND BATHING FACILITIES UNLESS THE CABINETRY CAN BE REMOVED WIHOUT REMOVAL OF THE LAVATORY, THE FLOOR FINISH EXTENDS UNDER THE CABINETRY, AND THE WALLS BEHIND AND SURROUNDING THE CABINETRY ARE FINISHED.

TYPE A ACCESSIBLE KITCHENS AND KITCHENETTES SHALL PROVIDE A CLEAR DISTANCE OF 40" BETWEEN COUNTERTOPS AND BASE CABINETS AND APPLIANCES AND ANY OPPOSING WALLS OR COUNTERTOPS OR CABINETS OR APPLIANCES. IN THE CASE OF U SHAPED KITCHENS THIS CLEAR DISTANCE IS 60" MIN.

TYPE A ACCESSIBLE KITCHENS AND KITCHENETTES SHALL INCLUDE AT LEAST ONE ACCESSIBLE WORK SURFACE A MAXIMUM OF 34" HIGH AND AT LEAST 30" IN LENGTH AND WITH A CLEAR FLOOR SPACE AND KNEE AND TOE CLEARANCE PROVIDED. CABINETRY SHALL NOT BE ALLOWED UNDER THE WORK SURFACE UNLESS THE CABINETRY CAN BE REMOVED WIHOUT REMOVAL OF THE WORK SURFACE, THE FLOOR FINISH EXTENDS UNDER THE CABINETRY, AND THE WALLS BEHIND AND SURROUNDING THE CABINETRY ARE FINISHED.

WATER SUPPLY AND DRAIN PIPES UNDER SINKS SHALL BE INSULATED OR OTHERWISE CONFIGURED TO PROTECT AGAINST CONTACT.

WHERE STORAGE FACILITIES ARE PROVIDED, AT LEAST ONE OF EACH TYPE SHALL BE ACCESSIBLE. KITCHEN CABINETS ARE NOT REQUIRED TO MEET THIS REQUIREMENT.

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

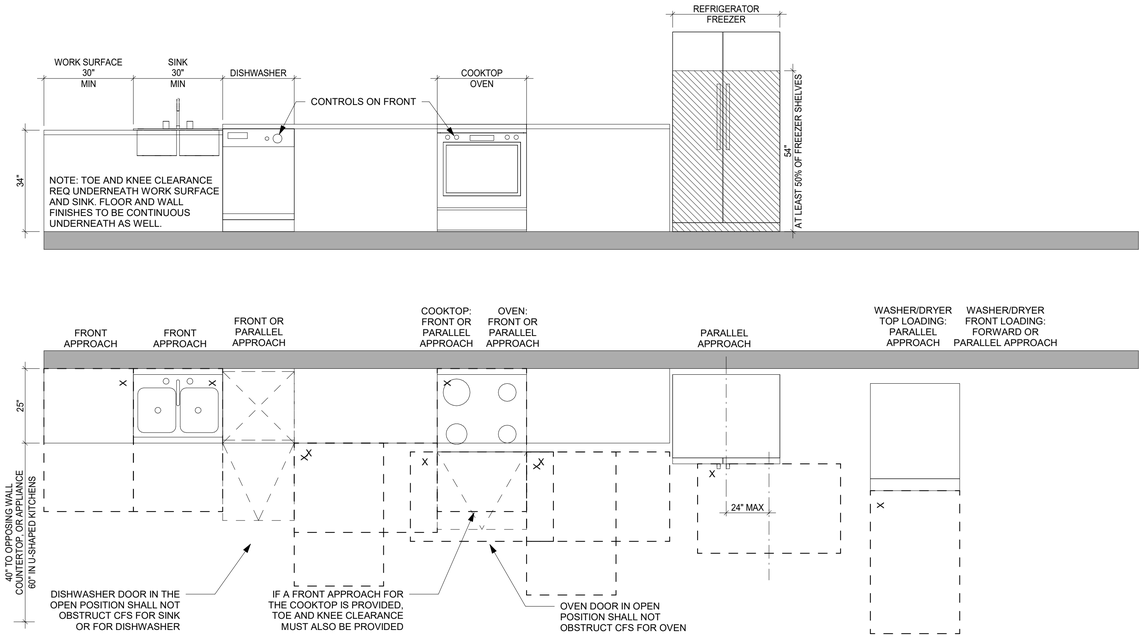
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

ACCESSIBILITY DETAILS - TYPE A

AG032

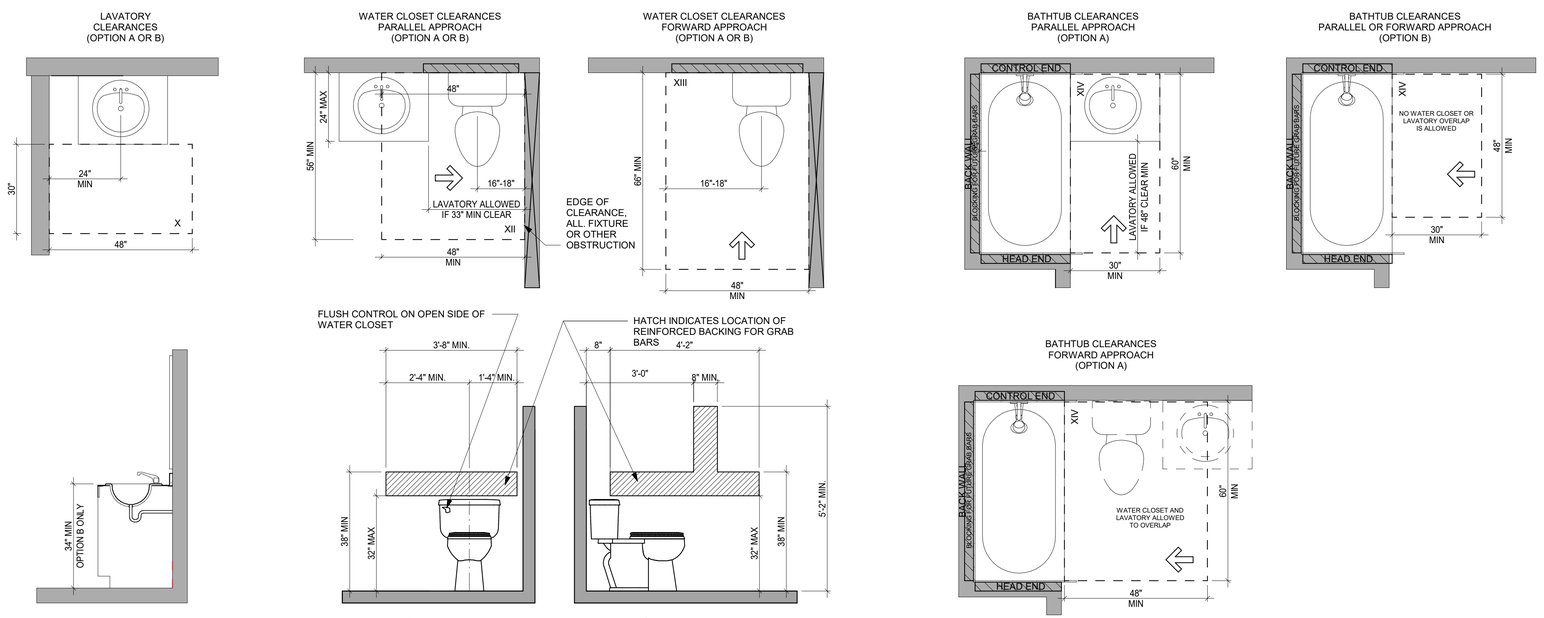
PLOT DATE: 3/28/2022 3:03:05 PM

COPYRIGHT©



TYPE A APPLIANCES - ICC/ANSI 117.1 1003.10 & 1003.12

1/2" = 1'-0"



TYPE B RESTROOM DETAILS - ICC/ANSI 117.1 1004.11

1/2" = 1'-0"

ACCESSIBILITY NOTES

1. THESE COMMONLY USED DETAILS ARE PROVIDED FOR CONVIENCE ONLY AND ARE NOT TO BE CONSTRUED AS A COMPREHENSIVE LIST OF ACCESSIBLE CONDITIONS THAT EXIST IN THE BUILDING.
2. DETAILS ARE BASED ON AND MUST MEET THE REQUIREMENTS OF ICC/ANSI 117.1 2009. IF A DISCREPANCY IS DISCOVERED, IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE ARCHITECT. DETAILS SHOWN IN ICC/ANSI 117.1 2009 TAKE PRECEDENCE OVER DETAILS SHOWN HERE AND MAY CONTAIN ADDITIONAL INFORMATION OR OPTIONS.
3. NOT ALL DETAILS SHOWN HERE ARE CONDITIONS THAT EXIST IN THE BUILDING AND NOT ALL CONDITIONS THAT EXIST IN THE BUILDING ARE DESCRIBED BY DETAILS SHOWN HERE.
4. DIMENSIONS ARE CLEAR FROM FINISH TO FINISH OR CENTERLINE OF ELEMENT UNLESS INDICATED OTHERWISE.

TYPE B ACCESSIBLE DWELLING UNIT SPECIFICATIONS:

THE PRIMARY ENTRANCE TO THE DWELLING UNIT MUST BE ON AN ACCESSIBLE ROUTE AND AT LEAST ONE ACCESSIBLE ROUTE SHALL CONNECT ALL SPACES AND ELEMENTS THAT ARE A PART OF THE UNIT.

THE PRIMARY ENTRANCE DOOR SHALL BE ACCESSIBLE AND ALL OTHER DOORS MEANT FOR USER PASSAGE SHALL HAVE A CLEAR OPENING OF 31 ¾ INCHES MINIMUM.

ALL OPERABLE PARTS FOR LIGHTING CONTROLS, ELECTRICAL SWITCHES AND RECEPTACLE OUTLETS, ENVIRONMENTAL CONTROLS, ELECTRICAL PANELBOARDS, AND USER CONTROLS FOR SECURITY OR INTERCOM SYSTEMS SHALL COMPLY WITH GENERAL ACCESSIBLE REACH REQUIREMENTS.

BLOCKING FOR FUTURE INSTALLATION OF GRAB BARS AT WATER CLOSETS, BATHTUBS, AND SHOWERS AND SHOWER SEATS SHALL BE PROVIDED AT ALL RESTROOM AND BATHING FACILITIES.

DOORS SHALL NOT SWING INTO THE CLEAR FLOOR SPACE FOR ANY FIXTURE IN AN ACCESSIBLEL TOILET OR BATHING FACILITY EXCEPT WHERE AN ADDITIONAL 30"X48" CLEAR FLOOR SPACE IS PROVIDED WITHIN THE ROOM BEYOND THE ARC OF THE DOOR.

TYPE B ACCESSIBLE KITCHENS AND KITCHENETTES SHALL PROVIDE A CLEAR DISTANCE OF 40" BETWEEN COUNTERTOPS AND BASE CABINETS AND APPLIANCES AND ANY OPPOSING WALLS OR COUNTERTOPS OR CABINETS OR APPLIANCES. IN THE CASE OF U SHAPED KITCHES THIS CLEAR DISTANCE IS 60" MIN.

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

ACCESSIBILITY
DETAILS - TYPE B

AG033

PLOT DATE: 3/28/2022 3:03:08 PM

COPYRIGHT©

Home Energy Rating Certificate

Projected Report

Rating Date:
Registry ID:
Ekotrope ID: BdNrJa3d

DEEPERGREEN CONSULTING

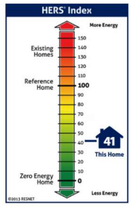
HERS® Index Score: 41
Your home's HERS score is a relative performance score. The lower the number, the more energy efficient the home. To learn more, visit www.hersindex.com

Annual Savings $1,675
*Relative to an average U.S. home

Home:
Frisco, CO 80443
Builder:

Your Home's Estimated Energy Use:

	Use [MBtu]	Annual Cost
Heating	11.7	$378
Cooling	0.0	$0
Hot Water	1.8	$59
Lights/Appliances	11.9	$382
Service Charges		$67
Generation (e.g. Solar)	0.0	$0
Total:	**25.4**	**$886**



Home Feature Summary:

Home Type:	Apartment, end unit
Model:	N/A
Community:	N/A
Conditioned Floor Area:	967 ft²
Number of Bedrooms:	2
Primary Heating System:	Air Source Heat Pump • Electric • 3.3 COP
Primary Cooling System:	Air Source Heat Pump • Electric • 11 EER
Primary Water Heating:	Residential Water Heater • Electric • 3.42 UEF
House Tightness:	3 ACH50
Ventilation:	35 CFM • 8 Watts
Duct Leakage to Outside:	Untested Forced Air
Above Grade Walls:	R-28
Ceiling:	Adiabatic, R-11
Window Type:	U-Value: 0.26, SHGC: 0.27
Foundation Walls:	N/A

This home meets or exceeds the criteria of the following:

ENERGY STAR MF v1.1
ENERGY STAR MF v1.0
2018 International Energy Conservation Code
2015 International Energy Conservation Code

Rating Completed by:

Energy Rater: Matt Jansing
RESNET ID: 8966139

Rating Company: Deeper Green Consulting
101 W. Main Street
9704714298

Rating Provider: Deeper Green Consulting
101 W. Main Street
9704714298

Matt Jansing, Certified Energy Rater
Date: 11/24/21 at 12:04 AM

ekotrope

Ekotrope RATER - Version:4.0.0.2781
The Energy Rating Disclosure for this home is available from the Approved Rating Provider.
This report does not constitute any warranty or guarantee.

Building Specification Summary

DEEPERGREEN CONSULTING

Property
Frisco, CO 80443

CDOT 2 Bed (L1)
ZERH Design

Organization
Deeper Green Consulting
Matt Jansing
502-338-0532

Builder

Inspection Status
Results are projected

Building Information

Conditioned Area [ft²]	966.80
Conditioned Volume [ft³]	9,738.80
Thermal Boundary Area [ft²]	3,224.60
Number Of Bedrooms	2
Housing Type	Apartment, end unit

Rating

HERS Index	41
HERS Index w/o PV	41

Building Shell

Ceiling w/ Attic	None
Vaulted Ceiling	None
Above Grade Walls	R5 Rockwool + R23 Blow 16oc; U-0.041
Found. Walls	None
Framed Floors	None
Slabs	R10 edge, R10 under; R-10
Windows (largest)	U-Value: 0.26, SHGC: 0.27
Window / Wall Ratio	0.13
Infiltration	3 ACH50
Duct Lkg to Outside	Untested Forced Air
Total Duct Leakage	36 CFM @ 25Pa (Rough-In, with Air Handler)

Mechanical Systems

Heating	Air Source Heat Pump • Electric • 3.3 COP
Cooling	Air Source Heat Pump • Electric • 11 EER
Water Heating	Residential Water Heater • Electric • 3.42 UEF
Programmable Thermostat	Yes
Ventilation System	35 CFM • 8 Watts

Lights and Appliances

Percent Interior LED	100%	Clothes Dryer Fuel	Electric
Percent Exterior LED	100%	Clothes Dryer CEF	3.9
Refrigerator (kWh/yr)	700.0	Clothes Washer LER (kWh/yr)	151.0
Dishwasher Efficiency	270 kWh	Clothes Washer Capacity	3.3
Ceiling Fan (CFM/Watt)	63.0	Range/Oven Fuel	Electric

Ekotrope RATER - Version 4.0.0.2781
All results are based on data entered by Ekotrope users. Ekotrope disclaims all liability for the information shown on this report.

Building Summary

DEEPERGREEN CONSULTING

Property
Frisco, CO 80443

CDOT 2 Bed (L1)
ZERH Design

Organization
Deeper Green Consulting
Matt Jansing
502-338-0532

Builder

Inspection Status
Results are projected

General Building Information

Number Of Bedrooms	2
Number Of Floors	1
Conditioned Floor Area [sq. ft.]	966.8
Has Electric Vehicle Ready Space	Yes
Unconditioned, attached garage?	No
Conditioned Volume [cu. ft.]	9,738.8
Total Units in Building	3
Residence Type	Apartment, end unit
Floor Number	1
Model	
Community	
RESNET/IECC 2006 Climate Zone	7B

Foundation Wall

None Present

Foundation Wall Library List

None Present

Slab

Name	Library Type	Perimeter	Floor Grade	Carpet R	Exposed Masonry Area	Surface Area	Location	Enclosing
Slab	R10 edge, R10 under	128.2	On Grade	0.68	0	966.8 ft²	Exposed Exterior	Conditioned Space

Slab Library List

Name	Wall Construction Type	Slab Completely Insulated?	Undersiab Insulation Width [ft]	Perimeter Insulation Depth [ft]	Perimeter Insulation R Value	Thermal Break	Effective R-value
R10 edge, R10 under	Wood Frame / Other	Yes	20	4	10	No	10.00

Framed Floor

None Present

Building Summary

DEEPERGREEN CONSULTING

Property
Frisco, CO 80443

CDOT 2 Bed (L1)
ZERH Design

Organization
Deeper Green Consulting
Matt Jansing
502-338-0532

Builder

Inspection Status
Results are projected

Framed Floor Library List

None Present

Rim Joist

Name	Library Type	Surface Area	Location
Rim Joist	R29 (includes exterior insulation if applicable)	137.5 ft²	Exposed Exterior

Rim Joist Library List

Name	Effective Insulation R-value
R29 (includes exterior insulation if applicable)	29.00

Wall

Name	Library Type	Surface Color	Surface Area	Location
Exterior Walls	R5 Rockwool + R23 Blow 16oc	Medium	1,153.5 ft²	Exposed Exterior

Wall Library List

Name	Effective R-value
R5 Rockwool + R23 Blow 16oc	24.585

Glazing

Name	Library Type	Wall Assignment	Foundation Wall Assignment	Is Operable	Overhang Depth	Overhang Ft To Top	Overhang Ft To Bottom	Orientation	Surface Area
2.5x4	.26 U / .27 SHGC	Exterior Walls		Yes	0	0	0	North	10.0 ft²
2.5x4	.26 U / .27 SHGC	Exterior Walls		Yes	0	0	0	West	10.0 ft²
3x2	.26 U / .27 SHGC	Exterior Walls		Yes	0	0	0	North	6.0 ft²
3x7door	.26 U / .27 SHGC	Exterior Walls		Yes	6	5	12	East	21.0 ft²

Building Summary

DEEPERGREEN CONSULTING

Property
Frisco, CO 80443

CDOT 2 Bed (L1)
ZERH Design

Organization
Deeper Green Consulting
Matt Jansing
502-338-0532

Builder

Inspection Status
Results are projected

Name	Library Type	Wall Assignment	Foundation Wall Assignment	Is Operable	Overhang Depth	Overhang Ft To Top	Overhang Ft To Bottom	Orientation	Surface Area
6x5	.26 U / .27 SHGC	Exterior Walls		Yes	6	2	7	East	30.0 ft²
6x5	.26 U / .27 SHGC	Exterior Walls		Yes	0	0	0	West	30.0 ft²
6x7door	.26 U / .27 SHGC	Exterior Walls		Yes	6	4	11	East	42.0 ft²

Glazing Library List

Name	Shgc	U-factor
.26 U / .27 SHGC	0.27	0.260

Skylight

None Present

Skylight Library List

None Present

Opaque Door

Name	Library Type	Wall Assignment	Foundation Wall Assignment	Emittance	Solar Absorptance	Surface Color	Surface Area	Location
Opaque Door	Fiberglass R-5	Exterior Walls		0.9	0.75	Medium	21.0 ft²	Exposed Exterior

Opaque Door Library List

Name	Effective R-value
Fiberglass R-5	5.00

Building Summary

DEEPERGREEN CONSULTING

Property
Frisco, CO 80443

CDOT 2 Bed (L1)
ZERH Design

Organization
Deeper Green Consulting
Matt Jansing
502-338-0532

Builder

Inspection Status
Results are projected

Roof Insulation

Name	Library Type	Attic Exterior Area [ft²]	Clay or Concrete Roof Tiles	Surface Color	Surface Area	Location
Ceiling (adiabatic)	R11 MF Adiabatic	966.8	No	Medium	966.8 ft²	Conditioned Space (Adiabatic)

Roof Insulation Library List

Name	Has Radiant Barrier	Effective R-value
R11 MF Adiabatic	No	11.645

Whole House Infiltration

Infiltration	Measurement Type	Shelter Class
3 ACH at 50 Pa	Blower-door tested	4

Mechanical Ventilation

Ventilation Type	Ventilation Rate [ft³ / Minute]	Operational hours per day	Fan Watts	Runs once every three hours	Energy Recovery Percent	Model Number	Manufacturer
Exhaust Only	35 CFM	24	8 Watts	No	0		

Lighting

% Interior Fluorescent Lighting	% Interior LED Lighting	% Exterior Fluorescent Lighting	% Exterior LED Lighting	% Garage Fluorescent Lighting	% Garage LED Lighting
0	100	0	100	0	100

Onsite Generation

None Present

PLOT DATE: 3/28/2022 3:03:09 PM

COPYRIGHT©

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

0 1" THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

ENERGY RATING SPECIFICATION - L1

AG041

Building Summary

Property
Frisco, CO 80443

CDOT 2 Bed (L1)
ZERH Design

Organization
Deeper Green Consulting
Matt Jansing
502-338-0532

Builder

Inspection Status
Results are projected

DEEPERGREEN CONSULTING

Onsite Generation Library List

None Present

Solar Generation

None Present

Dehumidifier

None Present

Dehumidifier Library List

None Present

Conditioning Equipment

Name	Library Type	Serial Number	Heating Percent Load	Cooling Percent Load	Hot Water Percent Load	Location
Heating Equipment	VTAC		100%	100%	0%	Conditioned Space
Water Heater	50 gal Hybrid Heat Pump		0%	0%	100%	Conditioned Space

Equipment Type: 50 gal Hybrid Heat Pump

Equipment Type	Residential Water Heater
Fuel Type	Electric
Distribution Type	Hydronic Delivery (Radiant)
Hot Water Efficiency	3.42 UEF
Tank Capacity (gal)	50

Building Summary

Property
Frisco, CO 80443

CDOT 2 Bed (L1)
ZERH Design

Organization
Deeper Green Consulting
Matt Jansing
502-338-0532

Builder

Inspection Status
Results are projected

DEEPERGREEN CONSULTING

Equipment Type: VTAC

Equipment Type	Air Source Heat Pump
Fuel Type	Electric
Distribution Type	Forced Air
Motor Type	ECM (Variable Speed)
Heating Efficiency	3.3 COP
Heating Capacity [kBtu/h]	20.5
Backup Fuel Type	Electric
Switchover Temperature [°F]	0
Backup Heating Efficiency	1 Adjusted Efficiency
Use default Supplemental Heat	No
Supplemental Heat [kW]	5
Cooling Efficiency	11 EER
Cooling Capacity [kBtu/h]	27.6

Distribution System

Distribution Type	Forced Air
Heating Equipment	Heating Equipment
Cooling Equipment	Heating Equipment
Sq. Feet Served	966.8
# Return Grilles	1
Supply Duct R Value	0
Return Duct R Value	0
Supply Duct Area [ft²]	261.036
Return Duct Area [ft²]	48.34
Leakage to Outdoors	Untested Forced Air
Estimated LtO	0.00 CFM25
Total Leakage	36 CFM25
Total Leakage Duct Test Conditions	Rough-In, with Air Handler
Use Default Flow Rate	Yes
Duct 1	
Duct Location	Conditioned Space
Percent Supply Area	100
Percent Return Area	100
Duct 2	
Duct Location	Conditioned Space
Percent Supply Area	0
Percent Return Area	0
Duct 3	
Duct Location	Conditioned Space
Percent Supply Area	0
Percent Return Area	0
Duct 4	
Duct Location	Conditioned Space
Percent Supply Area	0
Percent Return Area	0
Duct 5	
Duct Location	Conditioned Space
Percent Supply Area	0
Percent Return Area	0
Duct 6	
Duct Location	Conditioned Space
Percent Supply Area	0
Percent Return Area	0

Building Summary

Property
Frisco, CO 80443

CDOT 2 Bed (L1)
ZERH Design

Organization
Deeper Green Consulting
Matt Jansing
502-338-0532

Builder

Inspection Status
Results are projected

DEEPERGREEN CONSULTING

Ceiling Fan

Has Ceiling Fan	Yes
Cfm Per Watt	63

Water Distribution

Water Fixture Type	Low-flow
Use Default Hot Water Pipe Length	No
Hot Water Pipe Length [ft]	18
At Least R3 Pipe Insulation?	Yes
Hot Water Recirculation System?	No
Recirculation System Pipe Loop Length [ft]	170
Drain Water Heat Recovery?	No

Clothes Dryer

Cef	3.93
Fuel Type	Electric
Field Utilization	Moisture Sensing
Is Outside Conditioned Space	No
Clothes Dryer Available	Yes
Defaults Type	Custom

Clothes Washer

Label Energy Rating	151 kWh/Year
Annual Gas Cost	$12.00
Electric Rate	$0.11/kWh
Gas Rate	$1.22/Therm
Capacity	3.31
Imef	2.15473684
Defaults Type	High Efficiency
Load Type	Front-load
Loads Per Week	6
Is Outside Conditioned Space	No
Clothes Washer Available	Yes

Dishwasher

Dishwasher Efficiency	270 kWh
Dishwasher Size	Standard
Annual Gas Cost	$33.12
Electric Rate	$0.12/kWh
Gas Rate	$1.09/Therm
Is Outside Conditioned Space	No

Building Summary

Property
Frisco, CO 80443

CDOT 2 Bed (L1)
ZERH Design

Organization
Deeper Green Consulting
Matt Jansing
502-338-0532

Builder

Inspection Status
Results are projected

DEEPERGREEN CONSULTING

Appliances and Controls

Programmable thermostat?	Yes
Range/Oven Fuel	Electric
Convection Oven?	No
Induction Range?	No
Range/Oven Outside Conditioned Space?	No
Refrigerator Consumption	700 kWh/Year
Refrigerator Outside Conditioned Space?	No

Notes

11/11/21 MW
-Changed wall insulation from R5+R23 to R5+R21
-Under slab from R15 to 17
-Need to add ceiling fan
-Added EV charging
-Rim from R28 to 29
-Check MF Ceiling adiabatic library entry in other files. Does not appear to be accurate. Updated to R11 batt
-Updated VTAC Capacities
-Updated Ventilation fan watt from 15 to 8
-Added Ceiling fans at low speed. Help says medium. Is this a mandatory rated feature? Hurts us in CZ7

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

0" 1" THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

ENERGY RATING SPECIFICATION - L1 (CONTD.)

AG042

PLOT DATE: 3/28/2022 3:03:10 PM

COPYRIGHT©

Home Energy Rating Certificate

Projected Report

Rating Date:
Registry ID:
Ekotrope ID: kvy3zqGL

DEEPERGREEN CONSULTING

HERS® Index Score: 42
Your home's HERS score is a relative performance score. The lower the number, the more energy efficient the home. To learn more, visit www.hersindex.com

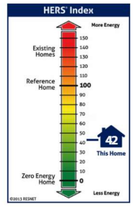
Annual Savings $1,112
*Relative to an average U.S. home

Home:
PO Box 2865
Frisco, CO 80443

Builder:

Your Home's Estimated Energy Use:

	Use [MBtu]	Annual Cost
Heating	7.8	$252
Cooling	0.0	$0
Hot Water	1.3	$42
Lights/Appliances	9.3	$299
Service Charges		$67
Generation (e.g. Solar)	0.0	$0
Total:	**18.4**	**$660**



Home Feature Summary:

Home Type:	Apartment, end unit
Model:	N/A
Community:	N/A
Conditioned Floor Area:	656 ft²
Number of Bedrooms:	1
Primary Heating System:	Air Source Heat Pump • Electric • 3.3 COP
Primary Cooling System:	Air Source Heat Pump • Electric • 11 EER
Primary Water Heating:	Residential Water Heater • Electric • 3.42 UEF
House Tightness:	3 ACH50
Ventilation:	35 CFM • 8 Watts
Duct Leakage to Outside:	Untested Forced Air
Above Grade Walls:	R-28
Ceiling:	Vaulted Roof, R-44
Window Type:	U-Value: 0.26, SHGC: 0.27
Foundation Walls:	N/A

This home meets or exceeds the criteria of the following:

ENERGY STAR MF v1.1
ENERGY STAR MF v1.0
2018 International Energy Conservation Code
2015 International Energy Conservation Code

Rating Completed by:

Energy Rater: Matt Jansing
RESNET ID: 8966139

Rating Company: Deeper Green Consulting
101 W. Main Street
9704714298

Rating Provider: Deeper Green Consulting
101 W. Main Street
9704714298

Matt Jansing, Certified Energy Rater
Date: 11/24/21 at 12:01 AM

ekotrope

Ekotrope RATER - Version:4.0.0.2781
The Energy Rating Disclosure for this home is available from the Approved Rating Provider.
This report does not constitute any warranty or guarantee.

Building Summary

DEEPERGREEN CONSULTING

Property
PO Box 2865
Frisco, CO 80443

CDOT 1 Bed (L3)
ZERH Design - W301

Organization
Deeper Green Consulting
Matt Jansing
502-338-0532

Builder

Inspection Status
Results are projected

General Building Information

Number Of Bedrooms	1
Number Of Floors	1
Conditioned Floor Area [sq. ft.]	655.5
Has Electric Vehicle Ready Space	Yes
Unconditioned, attached garage?	No
Conditioned Volume [cu. ft.]	9,338.6
Total Units in Building	11
Residence Type	Apartment, end unit
Floor Number	3
Model	
Community	
RESNET/IECC 2006 Climate Zone	7B

Foundation Wall

None Present

Foundation Wall Library List

None Present

Slab

None Present

Slab Library List

None Present

Framed Floor

Name	Library Type	Carpet R	Floor Grade	Surface Area	Location
Floor	R19 Fiberglass Batt 16oc	0.68	Above Grade	655.5 ft²	Conditioned Space (Adiabatic)

Building Summary

DEEPERGREEN CONSULTING

Property
PO Box 2865
Frisco, CO 80443

CDOT 1 Bed (L3)
ZERH Design - W301

Organization
Deeper Green Consulting
Matt Jansing
502-338-0532

Builder

Inspection Status
Results are projected

Framed Floor Library List

Name	Effective R-value
R19 Fiberglass Batt 16oc	19.886

Rim Joist

None Present

Rim Joist Library List

None Present

Wall

Name	Library Type	Surface Color	Surface Area	Location
Exterior Walls	R5 Rockwool + R23 Blow 16oc	Medium	751.5 ft²	Exposed Exterior
Gables and truss heels	R5 Rockwool + R24 CC-Foam 16oc	Medium	176.3 ft²	Exposed Exterior
Party Wall	R19 5.5" Batt 16oc	Medium	275.1 ft²	Conditioned Space (Adiabatic)

Wall Library List

Name	Effective R-value
R19 5.5" Batt 16oc	16.921
R5 Rockwool + R23 Blow 16oc	24.585
R5 Rockwool + R24 CC-Foam 16oc	24.974

Glazing

Name	Library Type	Wall Assignment	Foundation Wall Assignment	Is Operable	Overhang Depth	Overhang Ft To Top	Overhang Ft To Bottom	Orientation	Surface Area
3*2	26 U / .27 SHGC	Exterior Walls		Yes	2	1	3	West	6.0 ft²

Building Summary

DEEPERGREEN CONSULTING

Property
PO Box 2865
Frisco, CO 80443

CDOT 1 Bed (L3)
ZERH Design - W301

Organization
Deeper Green Consulting
Matt Jansing
502-338-0532

Builder

Inspection Status
Results are projected

Name	Library Type	Wall Assignment	Foundation Wall Assignment	Is Operable	Overhang Depth	Overhang Ft To Top	Overhang Ft To Bottom	Orientation	Surface Area
3*6	26 U / .27 SHGC	Exterior Walls		Yes	2	2.5	7.5	North	18.0 ft²
6*5	26 U / .27 SHGC	Exterior Walls		Yes	0	0	0	North	30.0 ft²
6*6	26 U / .27 SHGC	Exterior Walls		Yes	2	2	7	North	36.0 ft²

Glazing Library List

Name	Shgc	U-factor
26 U / .27 SHGC	0.27	0.260

Skylight

None Present

Skylight Library List

None Present

Opaque Door

Name	Library Type	Wall Assignment	Foundation Wall Assignment	Emittance	Solar Absorptance	Surface Color	Surface Area	Location
Opaque Door	Fiberglass R-5	Party Wall		0.9	0.75	Medium	21.0 ft²	Exposed Exterior

Opaque Door Library List

Name	Effective R-value
Fiberglass R-5	5.00

Building Specification Summary

DEEPERGREEN CONSULTING

Property
PO Box 2865
Frisco, CO 80443

CDOT 1 Bed (L3)
ZERH Design - W301

Organization
Deeper Green Consulting
Matt Jansing
502-338-0532

Builder

Inspection Status
Results are projected

Building Information

Conditioned Area [ft²]	655.50
Conditioned Volume [ft³]	9,338.60
Thermal Boundary Area [ft²]	2,628.10
Number Of Bedrooms	1
Housing Type	Apartment, end unit

Rating

HERS Index	42
HERS Index w/o PV	42

Building Shell

Ceiling w/ Attic	None
Vaulted Ceiling	R44 6.5"CC-Foam 24oc Trussed sealed attic; U-0.025
Above Grade Walls	R5 Rockwool + R23 Blow 16oc; U-0.041
Found. Walls	None
Framed Floors	None
Slabs	None
Windows (largest)	U-Value: 0.26, SHGC: 0.27
Window / Wall Ratio	0.07
Infiltration	3 ACH50
Duct Lkg to Outside	Untested Forced Air
Total Duct Leakage	26 CFM @ 25Pa (Rough-In, with Air Handler)

Mechanical Systems

Heating	Air Source Heat Pump • Electric • 3.3 COP
Cooling	Air Source Heat Pump • Electric • 11 EER
Water Heating	Residential Water Heater • Electric • 3.42 UEF
Programmable Thermostat	Yes
Ventilation System	35 CFM • 8 Watts

Lights and Appliances

Percent Interior LED	100%	Clothes Dryer Fuel	Electric
Percent Exterior LED	100%	Clothes Dryer CEF	3.9
Refrigerator (kWh/yr)	452.0	Clothes Washer LER (kWh/yr)	123.0
Dishwasher Efficiency	270 kWh	Clothes Washer Capacity	3.0
Ceiling Fan (CFM/Watt)	63.0	Range/Oven Fuel	Electric

Ekotrope RATER - Version 4.0.0.2781
All results are based on data entered by Ekotrope users. Ekotrope disclaims all liability for the information shown on this report.

Building Summary

DEEPERGREEN CONSULTING

Property
PO Box 2865
Frisco, CO 80443

CDOT 1 Bed (L3)
ZERH Design - W301

Organization
Deeper Green Consulting
Matt Jansing
502-338-0532

Builder

Inspection Status
Results are projected

Roof Insulation

Name	Library Type	Attic Exterior Area [ft²]	Clay or Concrete Roof Tiles	Surface Color	Surface Area	Location
Vaults	R44 6.5"CC-Foam 24oc Trussed sealed attic	769.7	No	Medium	769.7 ft²	Vaulted Roof

Roof Insulation Library List

Name	Has Radiant Barrier	Effective R-value
R44 6.5"CC-Foam 24oc Trussed sealed attic	No	39.289

Whole House Infiltration

Infiltration	Measurement Type	Shelter Class
3 ACH at 50 Pa	Blower-door tested	4

Mechanical Ventilation

Ventilation Type	Ventilation Rate [ft³ / Minute]	Operational hours per day	Fan Watts	Runs once every three hours	Energy Recovery Percent	Model Number	Manufacturer
Exhaust Only	35 CFM	24	8 Watts	No	0		

Lighting

% Interior Fluorescent Lighting	% Interior LED Lighting	% Exterior Fluorescent Lighting	% Exterior LED Lighting	% Garage Fluorescent Lighting	% Garage LED Lighting
0	100	0	100	0	100

Onsite Generation

None Present

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

0" 1" THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

ENERGY RATING SPECIFICATION - L3

AG043

PLOT DATE: 3/28/2022 3:03:12 PM

COPYRIGHT©

Building Summary

Property
PO Box 2865
Frisco, CO 80443

CDOT 1 Bed (L3)
ZERH Design - W301

Organization
Deeper Green Consulting
Matt Jansing
502-338-0532

Builder

Inspection Status
Results are projected

DEEPERGREEN CONSULTING

Onsite Generation Library List

None Present

Solar Generation

None Present

Dehumidifier

None Present

Dehumidifier Library List

None Present

Conditioning Equipment

Name	Library Type	Serial Number	Heating Percent Load	Cooling Percent Load	Hot Water Percent Load	Location
Heating Equipment	VTAC		100%	100%	0%	Conditioned Space
Water Heater	50 gal Hybrid Heat Pump		0%	0%	100%	Conditioned Space

Equipment Type: 50 gal Hybrid Heat Pump

Equipment Type	Residential Water Heater
Fuel Type	Electric
Distribution Type	Hydronic Delivery (Radiant)
Hot Water Efficiency	3.42 UEF
Tank Capacity (gal.)	50

Building Summary

Property
PO Box 2865
Frisco, CO 80443

CDOT 1 Bed (L3)
ZERH Design - W301

Organization
Deeper Green Consulting
Matt Jansing
502-338-0532

Builder

Inspection Status
Results are projected

DEEPERGREEN CONSULTING

Equipment Type: VTAC

Equipment Type	Air Source Heat Pump
Fuel Type	Electric
Distribution Type	Forced Air
Motor Type	ECM (Variable Speed)
Heating Efficiency	3.3 COP
Heating Capacity [kBtu/h]	20.5
Backup Fuel Type	Electric
Switchover Temperature [°F]	0
Backup Heating Efficiency	1 Adjusted Efficiency
Use default Supplemental Heat	No
Supplemental Heat [kW]	5
Cooling Efficiency	11 EER
Cooling Capacity [kBtu/h]	27.6

Distribution System

Distribution Type	Forced Air
Heating Equipment	Heating Equipment
Cooling Equipment	Heating Equipment
Sq. Feet Served	655.5
# Return Grilles	1
Supply Duct R Value	0
Return Duct R Value	0
Supply Duct Area [ft²]	176.985
Return Duct Area [ft²]	32.775
Leakage to Outdoors	Untested Forced Air
Estimated LtO	0.00 CFM25
Total Leakage	26 CFM25
Total Leakage Duct Test Conditions	Rough-In, with Air Handler
Use Default Flow Rate	Yes
Duct 1	
Duct Location	Conditioned Space
Percent Supply Area	100
Percent Return Area	100
Duct 2	
Duct Location	Conditioned Space
Percent Supply Area	0
Percent Return Area	0
Duct 3	
Duct Location	Conditioned Space
Percent Supply Area	0
Percent Return Area	0
Duct 4	
Duct Location	Conditioned Space
Percent Supply Area	0
Percent Return Area	0
Duct 5	
Duct Location	Conditioned Space
Percent Supply Area	0
Percent Return Area	0
Duct 6	
Duct Location	Conditioned Space
Percent Supply Area	0
Percent Return Area	0

Building Summary

Property
PO Box 2865
Frisco, CO 80443

CDOT 1 Bed (L3)
ZERH Design - W301

Organization
Deeper Green Consulting
Matt Jansing
502-338-0532

Builder

Inspection Status
Results are projected

DEEPERGREEN CONSULTING

Ceiling Fan

Has Ceiling Fan	Yes
Cfm Per Watt	63

Water Distribution

Water Fixture Type	Low-flow
Use Default Hot Water Pipe Length	No
Hot Water Pipe Length [ft]	18
At Least R3 Pipe Insulation?	Yes
Hot Water Recirculation System?	No
Recirculation System Pipe Loop Length [ft]	170
Drain Water Heat Recovery?	No

Clothes Dryer

Cef	3.93
Fuel Type	Electric
Field Utilization	Moisture Sensing
Is Outside Conditioned Space	No
Clothes Dryer Available	Yes
Defaults Type	Custom

Clothes Washer

Label Energy Rating	123 kWh/Year
Annual Gas Cost	$27.00
Electric Rate	$0.12/kWh
Gas Rate	$1.09/Therm
Capacity	3
Imef	3.2
Defaults Type	Custom
Load Type	Front-load
Loads Per Week	6
Is Outside Conditioned Space	No
Clothes Washer Available	Yes

Dishwasher

Dishwasher Efficiency	270 kWh
Dishwasher Size	Standard
Annual Gas Cost	$33.12
Electric Rate	$0.12/kWh
Gas Rate	$1.09/Therm
Is Outside Conditioned Space	No

Building Summary

Property
PO Box 2865
Frisco, CO 80443

CDOT 1 Bed (L3)
ZERH Design - W301

Organization
Deeper Green Consulting
Matt Jansing
502-338-0532

Builder

Inspection Status
Results are projected

DEEPERGREEN CONSULTING

Appliances and Controls

Programmable thermostat?	Yes
Range/Oven Fuel	Electric
Convection Oven?	Yes
Induction Range?	No
Range/Oven Outside Conditioned Space?	No
Refrigerator Consumption	452 kWh/Year
Refrigerator Outside Conditioned Space?	No

Notes

11-17-21 MW Notes
New sketch for this unit, assuming it's the worst case with North facing windows
W/D Amana ES certified
Whirlpool Fridge ES
Ventilation provided through VTAC

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

0" 1" THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

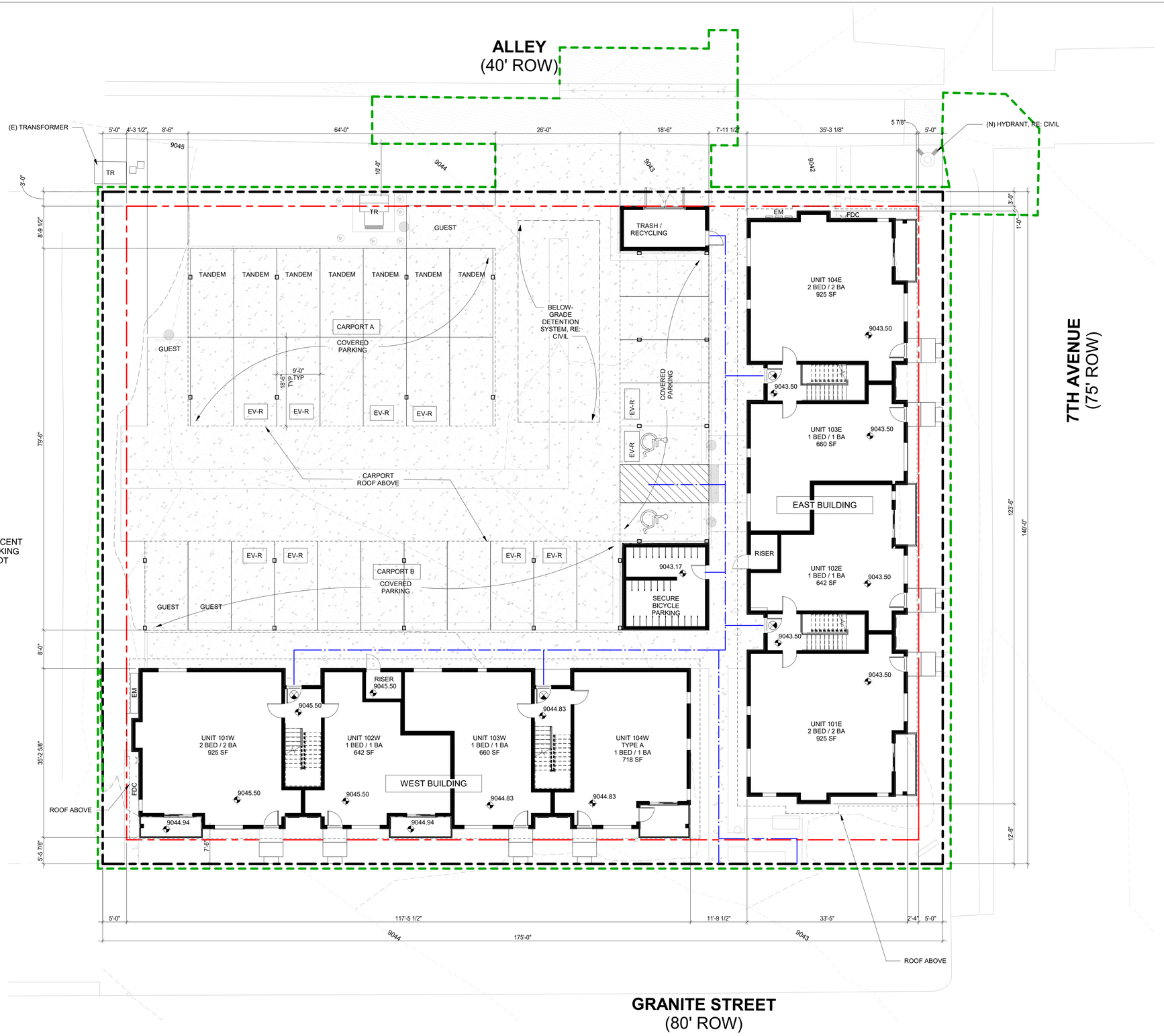
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

ENERGY RATING SPECIFICATION - L3 (CONTD.)

AG044

PLOT DATE: 3/28/2022 3:03:13 PM

COPYRIGHT©



GRANITE STREET
(80' ROW)

1 SITE PLAN
1" = 10'-0"

SITE PLAN SYMBOLS LEGEND

	EXIT
	ACCESSIBLE PARKING STALL
	EXTENTS OF WORK
	ACCESSIBLE PATH OF TRAVEL
	PROPERTY LINE
	SETBACK LINE
TR	TRANSFORMER
EM	ELECTRICAL METER LOCATION
EV-R	EV "READY" PARKING SPACE
FDC	FIRE DEPARTMENT CONNECTION

PROJECT SUMMARY

PROJECT SCOPE:

NEW 100% AFFORDABLE FOR RENT WORKFORCE HOUSING PROJECT CONSISTING OF TWO BUILDINGS AND COVERED SURFACE PARKING. EACH BUILDING CONSISTS OF (11) FOR-RENT RESIDENTIAL UNITS AND IS THREE-STORIES TALL. MOST OF THE (33) PROVIDED ON-SITE PARKING SPACES WILL BE COVERED BY OPEN CARPORTS.

LOT SIZE: 24,500 SF (0.56 AC)
ZONE: CENTRAL CORE (CC)

SETBACKS
- FRONT (GRANITE STREET): 5'
- SIDE (7TH AVENUE): 5'
- SIDE (INTERIOR LOT LINE): 5'
- REAR (ALLEY): 3'

LOT COVERAGE (SF)

WEST BUILDING:	3,889 SF
EAST BUILDING:	4,071 SF
BIKE PARKING:	342 SF
PRIVATE SIDEWALKS:	1,907 SF
PAVED PARKING:	9,530 SF
TOTAL:	19,739 SF

SNOW STORAGE

UNCOVERED PARKING AREA:	4,088 SF
REQ'D SNOW STORAGE AREA:	1,168 SF
PROVIDED SNOW STORAGE AREA:	1,171 SF

UNIT SUMMARY (BEDROOMS)

STUDIO UNITS:	5	(5)
1-BEDROOM UNITS:	11	(11)
2-BEDROOM UNITS:	6	(12)
TOTAL	22	(28)

PARKING SUMMARY
REQUIRED (1 PER BEDROOM)

STUDIO UNITS:	5
1-BEDROOM UNITS:	11
2-BEDROOM UNITS:	12
GUEST	4 (1 PER 5 UNITS)
TOTAL	32

PROVIDED

TANDEM:	7
REGULAR:	24
ACCESSIBLE:	2
TOTAL:	33

EV READY REQUIRED = 2, PROVIDED = 10*
EV CAPABLE SPACES REQUIRED = 7, PROVIDED = 0
*ONE OF THE SPACES MUST BE AN ACCESSIBLE PARKING SPACE

BICYCLE PARKING

REQUIRED	28
PROVIDED	28

GRAPHIC SCALE
0 10 20 30 40

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

ARCHITECTURAL SITE PLAN

AG101

PLOT DATE: 3/28/2022 3:03:14 PM

COPYRIGHT©

CODE SITE PLAN SYMBOLS LEGEND

- EXIT
- ACCESSIBLE PARKING STALL
- FDC — FIRE DEPARTMENT CONNECTION
- FIRE PARTITION - 30MIN
- EXTERIOR WALL - 1 HR
- FIRE BARRIER - 1 HR
- (R-2) OCCUPANCY
- (U) OCCUPANCY
- INCIDNTAL OCCUPANCY

1 CODE SITE PLAN
1" = 10'-0"

GRAPHIC SCALE
0 10 20 30 40

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

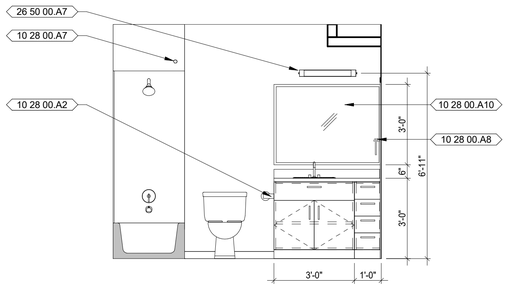
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

CODE SITE PLAN

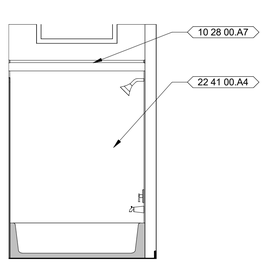
AG102

COPYRIGHT©

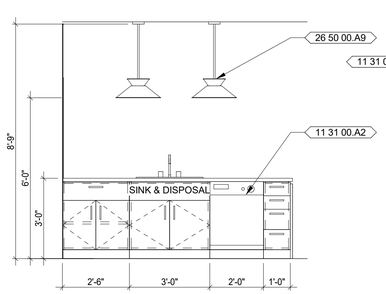
PLOT DATE: 3/28/2022 3:03:19 PM



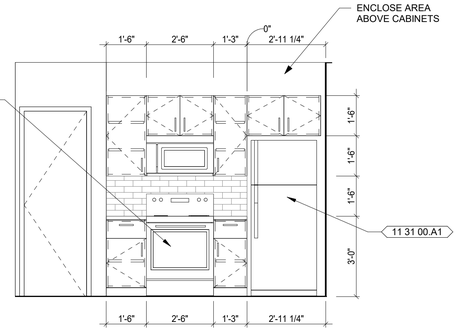
3/ UNIT S.1 - BATHROOM ELEVATION
3/8" = 1'-0"



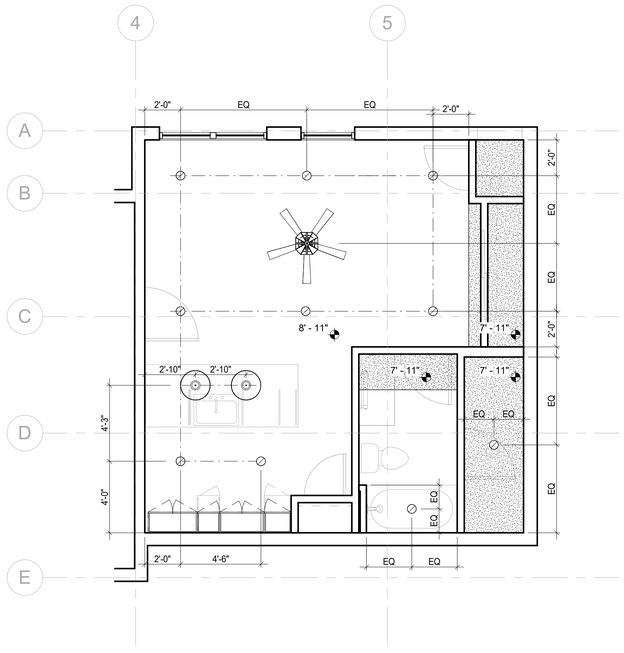
7/ BATHROOM ELEVATION
3/8" = 1'-0"



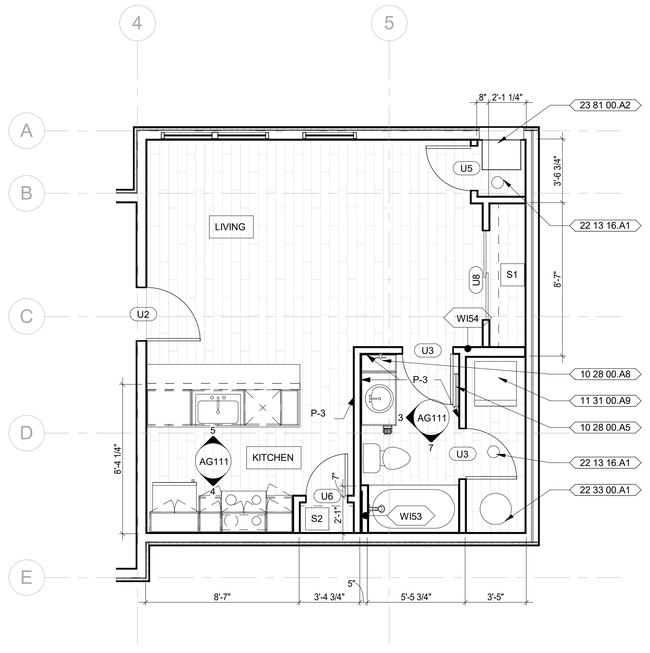
5/ KITCHEN ELEVATION
3/8" = 1'-0"



4/ KITCHEN ELEVATION
3/8" = 1'-0"



2/ REFLECTED CEILING PLAN
1/4" = 1'-0"



1/ FLOOR PLAN
1/4" = 1'-0"

UNIT PLAN NOTES

1. SEE SHEET AG603, FOR GENERAL INTERIOR FINISH NOTES ABBREVIATION KEY AND COMPLETE PRODUCT SPECIFICATION INFORMATION
2. LEVEL 3 KNOCK-DOWN TEXTURE ON ALL WALLS
3. ALL CEILINGS TO BE PAINTED (P-5) UNO
4. ALL UNIT INTERIOR WALLS TO BE PAINTED (P-1) UNO
5. ALL UNIT TRIM, BASE AND DOORS, TO BE PAINTED (P-4) UNO
6. ALL FLOORING TO BE (LVP-1) UNO, IN THE DIRECTION SHOWN IN UNIT PLANS
7. ALL BEDROOM FLOORING TO BE (CPT-1) UNO
8. ALL UNIT WALL BASE TO BE 4" MDF W/EASED EDGE
9. ALL KITCHEN BACKSPLASHES TO BE (T-1) UNO
10. ALL UNIT COUNTERTOPS TO BE (CTP-1) UNO
11. ALL UNIT CABINETS TO BE (CAB-1) UNO
12. ALL UNIT CABINET HARDWARE TO BE (HWD-1) UNO
13. ALL INTERIOR DIMENSIONS ARE TO FACE OF STUD UNLESS NOTED OTHERWISE; FOF - FACE OF FINISH; CL - CENTERLINE
14. WHERE DOORS IN WOOD STUD/GYPSUM BOARD PARTITIONS ARE NOT SPECIFICALLY LOCATED ON THE PLAN WITH DIMENSION STRINGS, PROVIDE A MINIMUM HINGE SIDE JAMB DIMENSION OF 4" FROM DOOR OPENING TO PERPENDICULAR WALLS. WHERE DOORS APPEAR TO BE CENTERED WITHIN HALLWAYS LOCATE THE DOORS IN THE CENTER OF THE HALLWAY.
15. WHERE TWO DIFFERING PARTITION TYPES ABUT IN A LINE AND ALONG A CONTINUOUS LENGTH OF PARTITIONS, THE CONTINUOUS FINISHED SURFACES OF THESE PARTITIONS SHALL ALIGN UNLESS NOTED OTHERWISE.
16. IF FRAMING NEW NON-RATED PARTITIONS TO THE BOTTOM OF THE STRUCTURAL CEILING, AND THOSE PARTITIONS INTERSECT MECHANICAL EQUIPMENT, THEN FRAME AROUND THE MECHANICAL EQUIPMENT ALLOWING CLEARANCES FOR MAINTENANCE. DO NOT FRME TIGHT AGAINST ANY EQUIPMENT THAT MAY CAUSE VIBRATIONS IN THE PARTITION ASSEMBLY. PROVIDE 1/2" CLEARANCE FROM ALL DUCTWORK. NOTIFY ARCHITECT IF A RATED PARTITION INTERSECTS MECHANICAL EQUIPMENT.
17. THERE SHALL BE NO EXPOSED PIPE, DUCTS, ETC. ALL SUCH LINES SHALL BE CONCEALED OR FURRED, UNLESS NOTED AS EXPOSED CONSTRUCTION .
18. ALL INTERIOR PARTITIONS ARE TYPE WI52 UNLESS NOTED OTHERWISE. SEE SHEET AG001 FOR PARTITION TYPES AND WIDTHS. PARTITION TYPES THAT CONTINUE AROUND CORNERS UNLESS INDICATED OTHERWISE.
19. PROVIDE SLIP JOINT CONNECTIONS AT THE TOPS OF ALL PARTITIONS WHICH INTERSECT THE STRUCTURE ABOVE; PROVIDE FIRE SAFING AT ALL SLIP JOINT CONNECTIONS IN FIRE-RATED PARTITIONS. SEE PARTITION TYPES FOR TYPICAL SLIP-JOINT CONNECTION DESIGN. IF AMOUNT OF DEFLECTION TO BE ACCOMODATED IS NOT INDICATED ON STRUCTURAL DRAWINGS, OBTAIN CLARIFICATION FROM ARCHITECT PRIOR TO PROCEEDING.
20. WHERE MECHANICAL WORK PENETRATES ANY COMPONENT OF THE FIRE-RATED ASSEMBLY, PROVIDE THE APPROPRIATE FIRE AND/OR SMOKE DAMPERS.
21. ALL WALLS ARE EITHER PARALLEL OR PERPENDICULAR UNLESS OTHERWISE NOTED. ALL ANGLED WALLS ARE MULTIPLES OF 45 DEGREES UNLESS NOTED OTHERWISE.
22. ALL OUTLETS SHOWN BACK-TO-BACK SHALL BE OFFSET A MINIMUM OF 6". A STUD SHALL SEPERATE OUTLETS IN ACOUSTIC PARTITIONS PROVIDE CEMENTITOUS BACKER UNITS AROUND ALL TILED SHOWER ENCLOSURES AND TUBS. PROVIDE WATER RESISTIVE GYPSUM BOARD AT TOILET ROOM WALLS. MAINTAIN REQUIRED FIRE RATING AT ALL PARTITIONS.

PLAN & RCP SYMBOLS

1i	DOOR TAG
1t	WINDOW TAG
ROOM NAME 101	ROOM TAG
WE606.1	WALL TAG RE:ASSEMBLIES
	PENDANT LIGHT
	RECESSED CAN DOWNLIGHT
	CEILING FAN
	DROPPED CEILING
	REMOVABLE CABINET
	REINFORCEMENT FOR FUTURE GRAB BARS

KEYNOTES

KEY VALUE	KEYNOTE TEXT
10 28 00.A2	TOILET TISSUE DISPENSER
10 28 00.A5	TOWEL BAR
10 28 00.A7	SHOWER CURTAIN ROD
10 28 00.A8	TOWEL RING
10 28 00.A10	FRAMELESS MIRROR W/ BEVELED EDGES
11 31 00.A1	ENERGY STAR, ADA COMPLIANT REFRIGERTOR - RF-1
11 31 00.A2	ENERGY STAR DISHWASHER - DW-1
11 31 00.A6	ELECTRIC RANGE AND OVEN WITH MICROWAVE ABOVE - ER-1
11 31 00.A9	ENERGY STAR STACKABLE WASHER/DRYER, WD-1
22 13 16.A1	FLOOR DRAIN RE: PLUMBING
22 33 00.A1	ELECTRIC WATER HEATER, RE: PLUMBING
22 41 00.A4	FIBERGLASS TUB SURROUND, REINFORCED FOR FUTURE INSTALLATION OF GRAB BARS
23 81 00.A2	VTAC UNIT, RE: MECH
26 50 00.A7	VANITY SCONCE LIGHT; RE: ELECTRICAL
26 50 00.A9	DECORATIVE PENDANT LIGHT, RE: ELECTRICAL

SHELVING LEGEND

S1	12" DEEP MDF SHELF AND HANGING ROD
S2	(5) 16" DEEP MDF FIXED SHELVES WITH LEDGER, SPACED 12" O.C.

* ACCESSIBLE UNIT TO INCLUDE ADJUSTABLE MDF SHELVES, INSTEAD OF FIXED

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

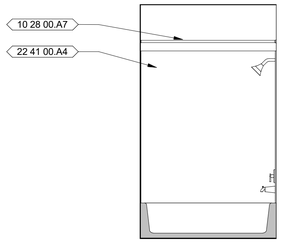
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

UNIT S.1 - FLOOR PLAN, RCP, & ELEV.

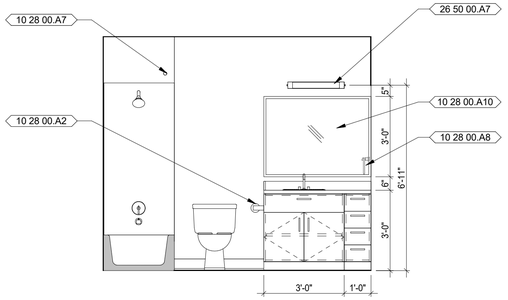
AG111

PLOT DATE: 3/25/2022 2:47:39 PM

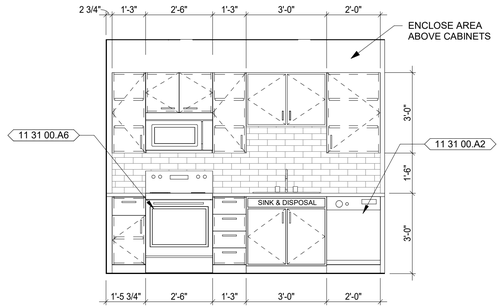
COPYRIGHT©



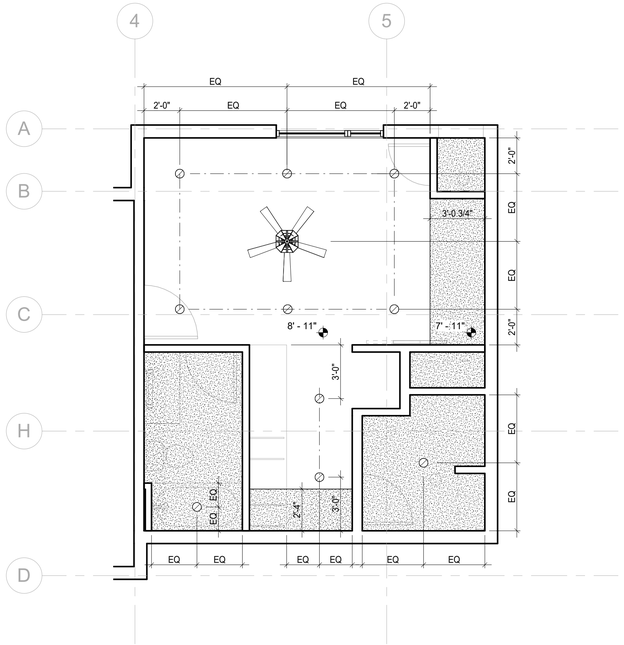
7/ BATHROOM ELEVATION
3/8" = 1'-0"



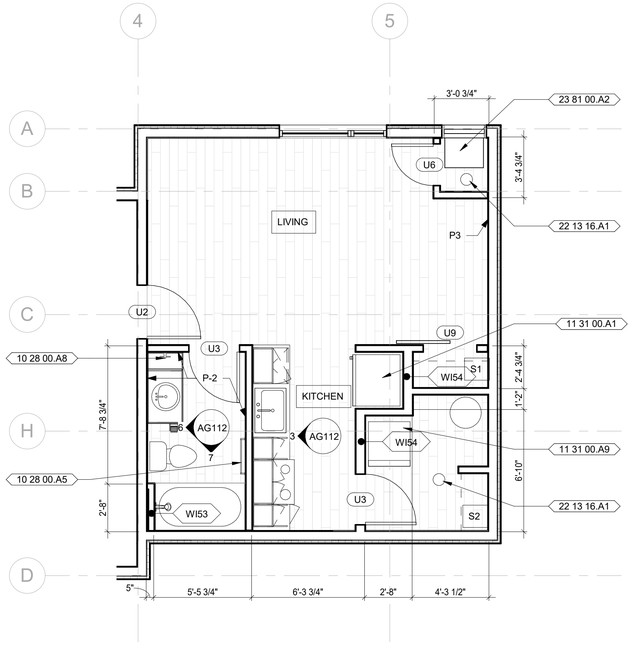
6/ BATHROOM ELEVATION
3/8" = 1'-0"



3/ KITCHEN ELEVATION
3/8" = 1'-0"



2/ RCP
1/4" = 1'-0"



1/ FLOOR PLAN
1/4" = 1'-0"

UNIT PLAN NOTES

1. SEE SHEET AG603, FOR GENERAL INTERIOR FINISH NOTES ABBREVIATION KEY AND COMPLETE PRODUCT SPECIFICATION INFORMATION
2. LEVEL 3 KNOCK-DOWN TEXTURE ON ALL WALLS
3. ALL CEILINGS TO BE PAINTED (P-5) UNO
4. ALL UNIT INTERIOR WALLS TO BE PAINTED (P-1) UNO
5. ALL UNIT TRIM, BASE AND DOORS, TO BE PAINTED (P-4) UNO
6. ALL FLOORING TO BE (LVP-1) UNO, IN THE DIRECTION SHOWN IN UNIT PLANS
7. ALL BEDROOM FLOORING TO BE (CPT-1) UNO
8. ALL UNIT WALL BASE TO BE 4" MDF W/EASED EDGE
9. ALL KITCHEN BACKSPLASHES TO BE (T-1) UNO
10. ALL UNIT COUNTERTOPS TO BE (CTP-1) UNO
11. ALL UNIT CABINETS TO BE (CAB-1) UNO
12. ALL UNIT CABINET HARDWARE TO BE (HWD-1) UNO
13. ALL INTERIOR DIMENSIONS ARE TO FACE OF STUD UNLESS NOTED OTHERWISE; FOF - FACE OF FINISH; CL - CENTERLINE
14. WHERE DOORS IN WOOD STUD/GYPSUM BOARD PARTITIONS ARE NOT SPECIFICALLY LOCATED ON THE PLAN WITH DIMENSION STRINGS, PROVIDE A MINIMUM HINGE SIDE JAMB DIMENSION OF 4" FROM DOOR OPENING TO PERPENDICULAR WALLS. WHERE DOORS APPEAR TO BE CENTERED WITHIN HALLWAYS LOCATE THE DOORS IN THE CENTER OF THE HALLWAY.
15. WHERE TWO DIFFERING PARTITION TYPES ABUT IN A LINE AND ALONG A CONTINUOUS LENGTH OF PARTITIONS, THE CONTINUOUS FINISHED SURFACES OF THESE PARTITIONS SHALL ALIGN UNLESS NOTED OTHERWISE.
16. IF FRAMING NEW NON-RATED PARTITIONS TO THE BOTTOM OF THE STRUCTURAL CEILING, AND THOSE PARTITIONS INTERSECT MECHANICAL EQUIPMENT, THEN FRAME AROUND THE MECHANICAL EQUIPMENT ALLOWING CLEARANCES FOR MAINTENANCE. DO NOT FRME TIGHT AGAINST ANY EQUIPMENT THAT MAY CAUSE VIBRATIONS IN THE PARTITION ASSEMBLY. PROVIDE 1/2" CLEARANCE FROM ALL DUCTWORK. NOTIFY ARCHITECT IF A RATED PARTITION INTERSECTS MECHANICAL EQUIPMENT.
17. THERE SHALL BE NO EXPOSED PIPE, DUCTS, ETC. ALL SUCH LINES SHALL BE CONCEALED OR FURRED, UNLESS NOTED AS EXPOSED CONSTRUCTION .
18. ALL INTERIOR PARTITIONS ARE TYPE W/52 UNLESS NOTED OTHERWISE. SEE SHEET AG001 FOR PARTITION TYPES AND WIDTHS. PARTITION TYPES THAT CONTINUE AROUND CORNERS UNLESS INDICATED OTHERWISE.
19. PROVIDE SLIP JOINT CONNECTIONS AT THE TOPS OF ALL PARTITIONS WHICH INTERSECT THE STRUCTURE ABOVE; PROVIDE FIRE SAFING AT ALL SLIP JOINT CONNECTIONS IN FIRE-RATED PARTITIONS. SEE PARTITION TYPES FOR TYPICAL SLIP-JOINT CONNECTION DESIGN. IF AMOUNT OF DEFLECTION TO BE ACCOMODATED IS NOT INDICATED ON STRUCTURAL DRAWINGS, OBTAIN CLARIFICATION FROM ARCHITECT PRIOR TO PROCEEDING.
20. WHERE MECHANICAL WORK PENETRATES ANY COMPONENT OF THE FIRE-RATED ASSEMBLY, PROVIDE THE APPROPRIATE FIRE AND/OR SMOKE DAMPERS.
21. ALL WALLS ARE EITHER PARALLEL OR PERPENDICULAR UNLESS OTHERWISE NOTED. ALL ANGLED WALLS ARE MULTIPLES OF 45 DEGREES UNLESS NOTED OTHERWISE.
22. ALL OUTLETS SHOWN BACK-TO-BACK SHALL BE OFFSET A MINIMUM OF 6". A STUD SHALL SEPERATE OUTLETS IN ACOUSTIC PARTITIONS PROVIDE CEMENTITOUS BACKER UNITS AROUND ALL TILED SHOWER ENCLOSURES AND TUBS. PROVIDE WATER RESISTIVE GYPSUM BOARD AT TOILET ROOM WALLS. MAINTAIN REQUIRED FIRE RATING AT ALL PARTITIONS.

PLAN & RCP SYMBOLS

1i	DOOR TAG
1t	WINDOW TAG
ROOM NAME 101	ROOM TAG
WE606.1	WALL TAG RE:ASSEMBLIES
	PENDANT LIGHT
	RECESSED CAN DOWNLIGHT
	CEILING FAN
	DROPPED CEILING
	REMOVABLE CABINET

KEYNOTES

KEY VALUE	KEYNOTE TEXT
10 28 00.A2	TOILET TISSUE DISPENSER
10 28 00.A5	TOWEL BAR
10 28 00.A7	SHOWER CURTAIN ROD
10 28 00.A8	TOWEL RING
10 28 00.A10	FRAMELESS MIRROR W/ BEVELED EDGES
11 31 00.A1	ENERGY STAR, ADA COMPLIANT REFRIGERTOR - RF-1
11 31 00.A2	ENERGY STAR DISHWASHER - DW-1
11 31 00.A6	ELECTRIC RANGE AND OVEN WITH MICROWAVE ABOVE - ER-1
11 31 00.A9	ENERGY STAR STACKABLE WASHER/DRYER, WD-1
22 13 16.A1	FLOOR DRAIN RE: PLUMBING
22 41 00.A4	FIBERGLASS TUB SURROUND, REINFORCED FOR FUTURE INSTALLATION OF GRAB BARS
23 81 00.A2	VTAC UNIT, RE: MECH
26 50 00.A7	VANITY SCONCE LIGHT; RE: ELECTRICAL

SHELVING LEGEND

S1	12" DEEP MDF SHELF AND HANGING ROD
S2	(5) 16" DEEP MDF FIXED SHELVES WITH LEDGER, SPACED 12" O.C.

* ACCESSIBLE UNIT TO INCLUDE ADJUSTABLE MDF SHELVES, INSTEAD OF FIXED

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

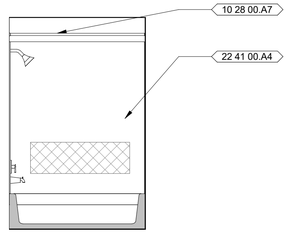
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

UNIT S.2 - FLOOR PLAN, RCP, & ELEV.

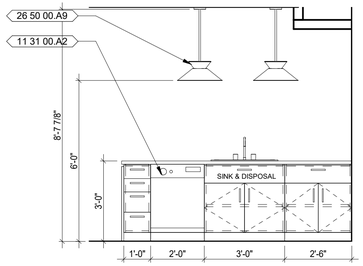
AG112

PLOT DATE: 3/25/2022 2:40:41 PM

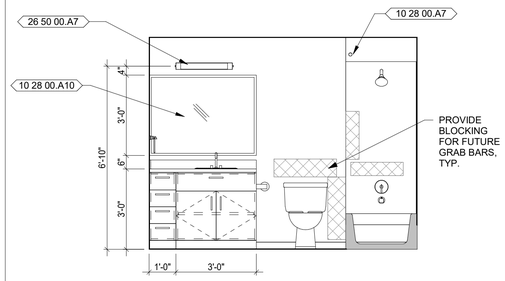
COPYRIGHT©



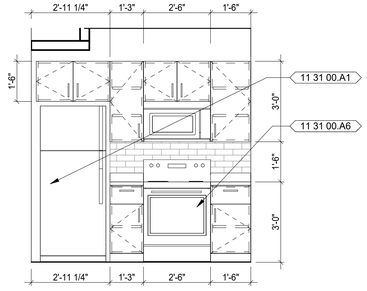
7 BATHROOM ELEVATION
3/8" = 1'-0"



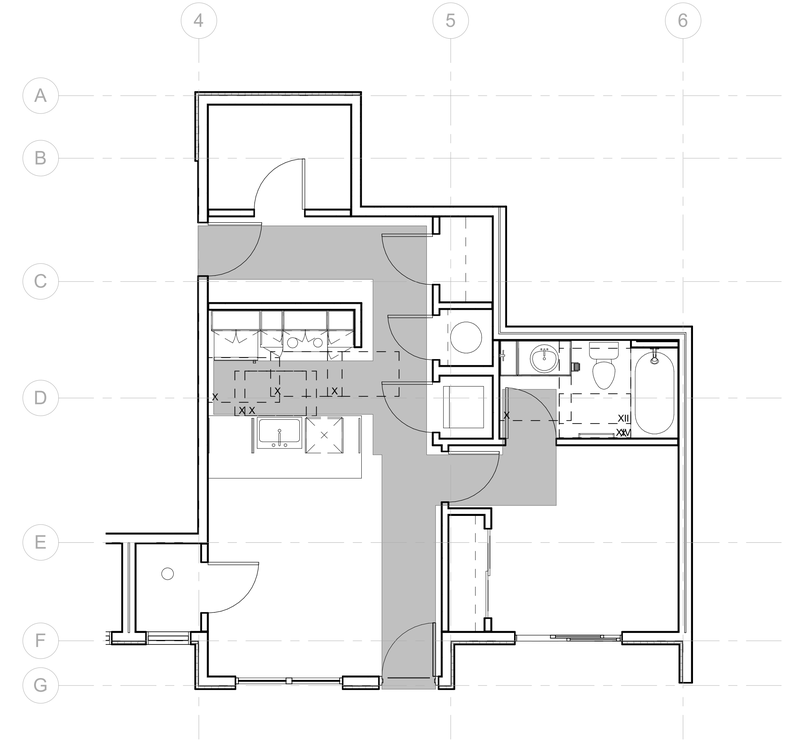
5 KITCHEN ELEVATION
3/8" = 1'-0"



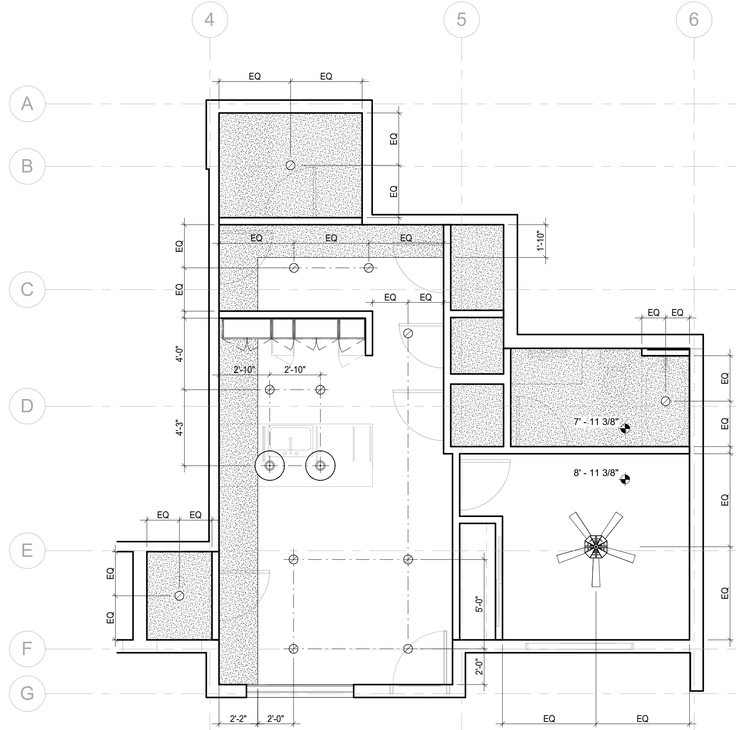
6 BATHROOM ELEVATION
3/8" = 1'-0"



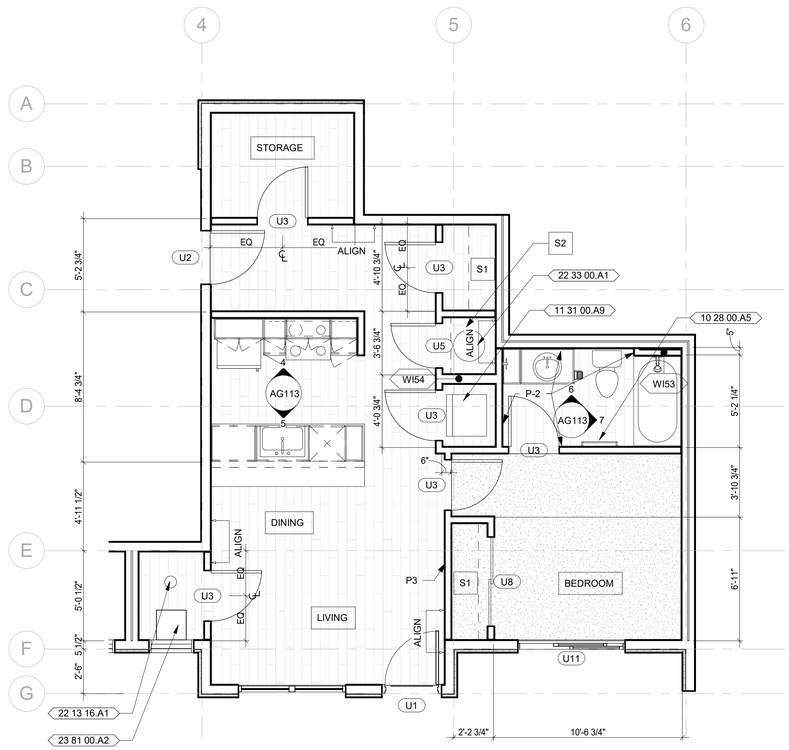
4 KITCHEN ELEVATION
3/8" = 1'-0"



2 ACCESSIBILITY PLAN (ANSI TYPE "B" ACCESSIBLE)
1/4" = 1'-0"



3 RCP
1/4" = 1'-0"



1 FLOOR PLAN
1/4" = 1'-0"

UNIT PLAN NOTES

1. SEE SHEET AG603, FOR GENERAL INTERIOR FINISH NOTES ABBREVIATION KEY AND COMPLETE PRODUCT SPECIFICATION INFORMATION
2. LEVEL 3 KNOCK-DOWN TEXTURE ON ALL WALLS
3. ALL CEILINGS TO BE PAINTED (P-5) UNO
4. ALL UNIT INTERIOR WALLS TO BE PAINTED (P-1) UNO
5. ALL UNIT TRIM, BASE AND DOORS, TO BE PAINTED (P-4) UNO
6. ALL FLOORING TO BE (LVP-1) UNO, IN THE DIRECTION SHOWN IN UNIT PLANS
7. ALL BEDROOM FLOORING TO BE (CPT-1) UNO
8. ALL UNIT WALL BASE TO BE 4" MDF W/EASED EDGE
9. ALL KITCHEN BACKSPLASHES TO BE (T-1) UNO
10. ALL UNIT COUNTERTOPS TO BE (CTP-1) UNO
11. ALL UNIT CABINETS TO BE (CAB-1) UNO
12. ALL UNIT CABINET HARDWARE TO BE (HWD-1) UNO
13. ALL INTERIOR DIMENSIONS ARE TO FACE OF STUD UNLESS NOTED OTHERWISE; FOF - FACE OF FINISH; CL - CENTERLINE
14. WHERE DOORS IN WOOD STUD/GYPSUM BOARD PARTITIONS ARE NOT SPECIFICALLY LOCATED ON THE PLAN WITH DIMENSION STRINGS, PROVIDE A MINIMUM HINGE SIDE JAMB DIMENSION OF 4" FROM DOOR OPENING TO PERPENDICULAR WALLS. WHERE DOORS APPEAR TO BE CENTERED WITHIN HALLWAYS LOCATE THE DOORS IN THE CENTER OF THE HALLWAY.
15. WHERE TWO DIFFERING PARTITION TYPES ABUT IN A LINE AND ALONG A CONTINUOUS LENGTH OF PARTITIONS, THE CONTINUOUS FINISHED SURFACES OF THESE PARTITIONS SHALL ALIGN UNLESS NOTED OTHERWISE.
16. IF FRAMING NEW NON-RATED PARTITIONS TO THE BOTTOM OF THE STRUCTURAL CEILING, AND THOSE PARTITIONS INTERSECT MECHANICAL EQUIPMENT, THEN FRAME AROUND THE MECHANICAL EQUIPMENT ALLOWING CLEARANCES FOR MAINTENANCE. DO NOT FRME TIGHT AGAINST ANY EQUIPMENT THAT MAY CAUSE VIBRATIONS IN THE PARTITION ASSEMBLY. PROVIDE 1/2" CLEARANCE FROM ALL DUCTWORK. NOTIFY ARCHITECT IF A RATED PARTITION INTERSECTS MECHANICAL EQUIPMENT.
17. THERE SHALL BE NO EXPOSED PIPE, DUCTS, ETC. ALL SUCH LINES SHALL BE CONCEALED OR FURRED, UNLESS NOTED AS EXPOSED CONSTRUCTION
18. ALL INTERIOR PARTITIONS ARE TYPE WI52 UNLESS NOTED OTHERWISE. SEE SHEET AG001 FOR PARTITION TYPES AND WIDTHS. PARTITION TYPES THAT CONTINUE AROUND CORNERS UNLESS INDICATED OTHERWISE.
19. PROVIDE SLIP JOINT CONNECTIONS AT THE TOPS OF ALL PARTITIONS WHICH INTERSECT THE STRUCTURE ABOVE; PROVIDE FIRE SAFING AT ALL SLIP JOINT CONNECTIONS IN FIRE-RATED PARTITIONS. SEE PARTITION TYPES FOR TYPICAL SLIP-JOINT CONNECTION DESIGN. IF AMOUNT OF DEFLECTION TO BE ACCOMODATED IS NOT INDICATED ON STRUCTURAL DRAWINGS, OBTAIN CLARIFICATION FROM ARCHITECT PRIOR TO PROCEEDING.
20. WHERE MECHANICAL WORK PENETRATES ANY COMPONENT OF THE FIRE-RATED ASSEMBLY, PROVIDE THE APPROPRIATE FIRE AND/OR SMOKE DAMPERS.
21. ALL WALLS ARE EITHER PARALLEL OR PERPENDICULAR UNLESS OTHERWISE NOTED. ALL ANGLED WALLS ARE MULTIPLES OF 45 DEGREES UNLESS NOTED OTHERWISE.
22. ALL OUTLETS SHOWN BACK-TO-BACK SHALL BE OFFSET A MINIMUM OF 6". A STUD SHALL SEPERATE OUTLETS IN ACOUSTIC PARTITIONS PROVIDE CEMENTITOUS BACKER UNITS AROUND ALL TILED SHOWER ENCLOSURES AND TUBS. PROVIDE WATER RESISTIVE GYPSUM BOARD AT TOILET ROOM WALLS. MAINTAIN REQUIRED FIRE RATING AT ALL PARTITIONS.

PLAN & RCP SYMBOLS

- 1i — DOOR TAG
- 1t — WINDOW TAG
- ROOM NAME / 101 — ROOM TAG
- WE606.1 — WALL TAG RE:ASSEMBLIES
- PENDANT LIGHT
- RECESSED CAN DOWNLIGHT
- CEILING FAN
- DROPPED CEILING
- REMOVABLE CABINET
- REINFORCEMENT FOR FUTURE GRAB BARS

KEYNOTES

KEY VALUE	KEYNOTE TEXT
10 28 00.A5	TOWEL BAR
10 28 00.A7	SHOWER CURTAIN ROD
10 28 00.A10	FRAMELESS MIRROR W/ BEVELED EDGES
11 31 00.A1	ENERGY STAR, ADA COMPLIANT REFRIGERTOR - RF-1
11 31 00.A2	ENERGY STAR DISHWASHER - DW-1
11 31 00.A6	ELECTRIC RANGE AND OVEN WITH MICROWAVE ABOVE - ER-1
11 31 00.A9	ENERGY STAR STACKABLE WASHER/DRYER, WD-1
22 13 16.A1	FLOOR DRAIN RE: PLUMBING
22 33 00.A1	ELECTRIC WATER HEATER, RE: PLUMBING
22 41 00.A4	FIBERGLASS TUB SURROUND, REINFORCED FOR FUTURE INSTALLATION OF GRAB BARS
23 81 00.A2	VTAC UNIT, RE: MECH
26 50 00.A7	VANITY SCONCE LIGHT; RE: ELECTRICAL
26 50 00.A9	DECORATIVE PENDANT LIGHT, RE: ELECTRICAL

SHELVING LEGEND

S1	12" DEEP MDF SHELF AND HANGING ROD
S2	(5) 16" DEEP MDF FIXED SHELVES WITH LEDGER, SPACED 12" O.C.

* ACCESSIBLE UNIT TO INCLUDE ADJUSTABLE MDF SHELVES, INSTEAD OF FIXED

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

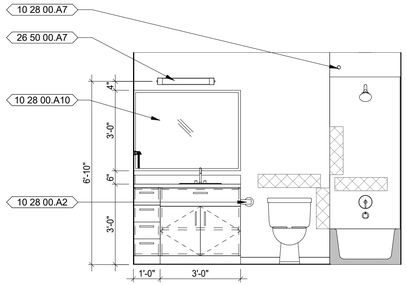
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

UNIT 1.1 - FLOOR PLAN, RCP, & ELEVATIONS

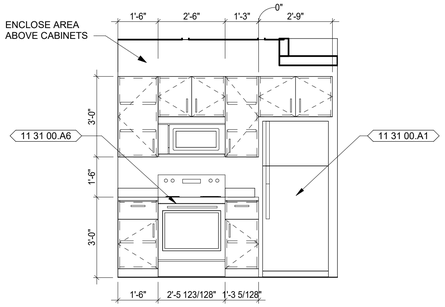
AG113

PLOT DATE: 3/25/2022 2:49:50 PM

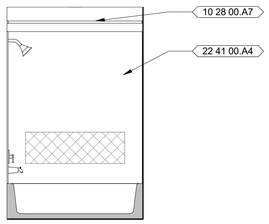
COPYRIGHT©



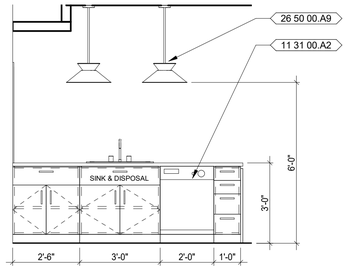
6 BATHROOM ELEVATION
3/8" = 1'-0"



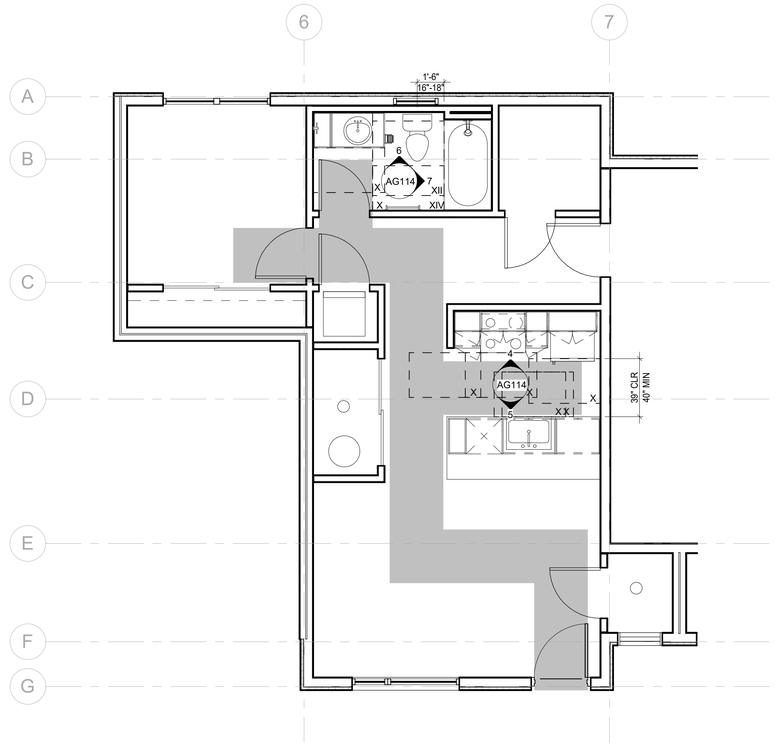
4 KITCHEN ELEVATION
3/8" = 1'-0"



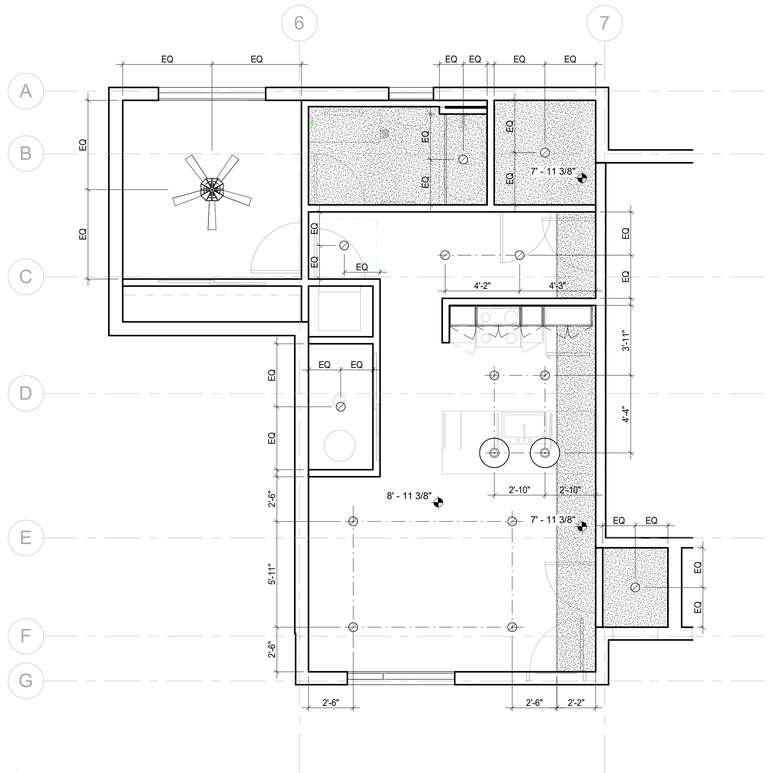
7 BATHROOM ELEVATION
3/8" = 1'-0"



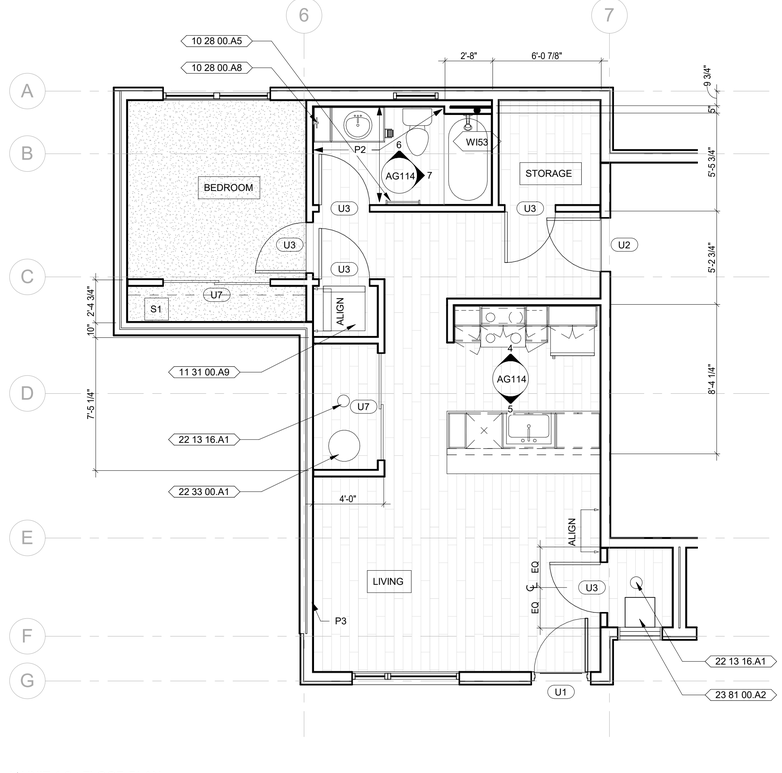
5 KITCHEN ELEVATION
3/8" = 1'-0"



2 UNIT 1.2 - ACCESSIBILITY PLAN (ANSI TYPE "B" ACCESSIBLE)
1/4" = 1'-0"



3 UNIT 1.2 - RCP
1/4" = 1'-0"



1 UNIT 1.2 - FLOOR PLAN
1/4" = 1'-0"

UNIT PLAN NOTES

1. SEE SHEET AG603, FOR GENERAL INTERIOR FINISH NOTES ABBREVIATION KEY AND COMPLETE PRODUCT SPECIFICATION INFORMATION
2. LEVEL 3 KNOCK-DOWN TEXTURE ON ALL WALLS
3. ALL CEILINGS TO BE PAINTED (P-5) UNO
4. ALL UNIT INTERIOR WALLS TO BE PAINTED (P-1) UNO
5. ALL UNIT TRIM, BASE AND DOORS, TO BE PAINTED (P-4) UNO
6. ALL FLOORING TO BE (LVP-1) UNO, IN THE DIRECTION SHOWN IN UNIT PLANS
7. ALL BEDROOM FLOORING TO BE (CPT-1) UNO
8. ALL UNIT WALL BASE TO BE 4" MDF W/EASED EDGE
9. ALL KITCHEN BACKSPLASHES TO BE (T-1) UNO
10. ALL UNIT COUNTERTOPS TO BE (CTP-1) UNO
11. ALL UNIT CABINETS TO BE (CAB-1) UNO
12. ALL UNIT CABINET HARDWARE TO BE (HWD-1) UNO
13. ALL INTERIOR DIMENSIONS ARE TO FACE OF STUD UNLESS NOTED OTHERWISE: FOF - FACE OF FINISH; CL - CENTERLINE
14. WHERE DOORS IN WOOD STUD/GYPSUM BOARD PARTITIONS ARE NOT SPECIFICALLY LOCATED ON THE PLAN WITH DIMENSION STRINGS, PROVIDE A MINIMUM HINGE SIDE JAMB DIMENSION OF 4" FROM DOOR OPENING TO PERPENDICULAR WALLS. WHERE DOORS APPEAR TO BE CENTERED WITHIN HALLWAYS LOCATE THE DOORS IN THE CENTER OF THE HALLWAY.
15. WHERE TWO DIFFERING PARTITION TYPES ABUT IN A LINE AND ALONG A CONTINUOUS LENGTH OF PARTITIONS, THE CONTINUOUS FINISHED SURFACES OF THESE PARTITIONS SHALL ALIGN UNLESS NOTED OTHERWISE.
16. IF FRAMING NEW NON-RATED PARTITIONS TO THE BOTTOM OF THE STRUCTURAL CEILING, AND THOSE PARTITIONS INTERSECT MECHANICAL EQUIPMENT, THEN FRAME AROUND THE MECHANICAL EQUIPMENT ALLOWING CLEARANCES FOR MAINTENANCE. DO NOT FRME TIGHT AGAINST ANY EQUIPMENT THAT MAY CAUSE VIBRATIONS IN THE PARTITION ASSEMBLY. PROVIDE 1/2" CLEARANCE FROM ALL DUCTWORK. NOTIFY ARCHITECT IF A RATED PARTITION INTERSECTS MECHANICAL EQUIPMENT.
17. THERE SHALL BE NO EXPOSED PIPE, DUCTS, ETC. ALL SUCH LINES SHALL BE CONCEALED OR FURRED, UNLESS NOTED AS EXPOSED CONSTRUCTION .
18. ALL INTERIOR PARTITIONS ARE TYPE W152 UNLESS NOTED OTHERWISE. SEE SHEET AG001 FOR PARTITION TYPES AND WIDTHS. PARTITION TYPES THAT CONTINUE AROUND CORNERS UNLESS INDICATED OTHERWISE.
19. PROVIDE SLIP JOINT CONNECTIONS AT THE TOPS OF ALL PARTITIONS WHICH INTERSECT THE STRUCTURE ABOVE; PROVIDE FIRE SAFING AT ALL SLIP JOINT CONNECTIONS IN FIRE-RATED PARTITIONS. SEE PARTITION TYPES FOR TYPICAL SLIP-JOINT CONNECTION DESIGN. IF AMOUNT OF DEFLECTION TO BE ACCOMODATED IS NOT INDICATED ON STRUCTURAL DRAWINGS, OBTAIN CLARIFICATION FROM ARCHITECT PRIOR TO PROCEEDING.
20. WHERE MECHANICAL WORK PENETRATES ANY COMPONENT OF THE FIRE-RATED ASSEMBLY, PROVIDE THE APPROPRIATE FIRE AND/OR SMOKE DAMPERS.
21. ALL WALLS ARE EITHER PARALLEL OR PERPENDICULAR UNLESS OTHERWISE NOTED. ALL ANGLED WALLS ARE MULTIPLES OF 45 DEGREES UNLESS NOTED OTHERWISE.
22. ALL OUTLETS SHOWN BACK-TO-BACK SHALL BE OFFSET A MINIMUM OF 6". A STUD SHALL SEPERATE OUTLETS IN ACOUSTIC PARTITIONS PROVIDE CEMENTITOUS BACKER UNITS AROUND ALL TILED SHOWER ENCLOSURES AND TUBS. PROVIDE WATER RESISTIVE GYPSUM BOARD AT TOILET ROOM WALLS. MAINTAIN REQUIRED FIRE RATING AT ALL PARTITIONS.

PLAN & RCP SYMBOLS

- 1i — DOOR TAG
- 1t — WINDOW TAG
- ROOM NAME 101 — ROOM TAG
- WE606.1 — WALL TAG RE:ASSEMBLIES
- PENDANT LIGHT
- RECESSED CAN DOWNLIGHT
- CEILING FAN
- DROPPED CEILING
- REMOVABLE CABINET
- REINFORCEMENT FOR FUTURE GRAB BARS

KEYNOTES

KEY VALUE	KEYNOTE TEXT
10 28 00.A2	TOILET TISSUE DISPENSER
10 28 00.A5	TOWEL BAR
10 28 00.A7	SHOWER CURTAIN ROD
10 28 00.A8	TOWEL RING
10 28 00.A10	FRAMELESS MIRROR W/ BEVELED EDGES
11 31 00.A1	ENERGY STAR, ADA COMPLIANT REFRIGERTOR - RF-1
11 31 00.A2	ENERGY STAR DISHWASHER - DW-1
11 31 00.A6	ELECTRIC RANGE AND OVEN WITH MICROWAVE ABOVE - ER-1
11 31 00.A9	ENERGY STAR STACKABLE WASHER/DRYER, WD-1
22 13 16.A1	FLOOR DRAIN RE: PLUMBING
22 33 00.A1	ELECTRIC WATER HEATER, RE: PLUMBING
22 41 00.A4	FIBERGLASS TUB SURROUND, REINFORCED FOR FUTURE INSTALLATION OF GRAB BARS
23 81 00.A2	VTAC UNIT, RE: MECH
26 50 00.A7	VANITY SCONCE LIGHT; RE: ELECTRICAL
26 50 00.A9	DECORATIVE PENDANT LIGHT, RE: ELECTRICAL

SHELVING LEGEND

- S1 — 12" DEEP MDF SHELF AND HANGING ROD
- S2 — (5) 16" DEEP MDF FIXED SHELVES WITH LEDGER, SPACED 12" O.C.

* ACCESSIBLE UNIT TO INCLUDE ADJUSTABLE MDF SHELVES, INSTEAD OF FIXED

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

GRANITE STREET WORFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

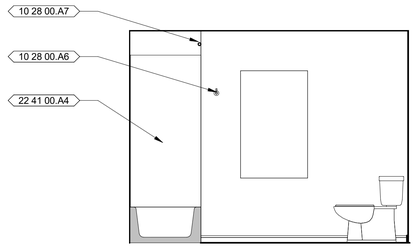
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

UNIT 1.2 - FLOOR PLAN, RCP, & ELEVATIONS

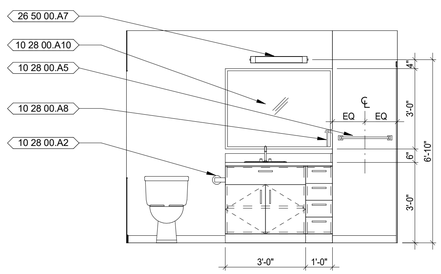
AG114

PLOT DATE: 3/25/2022 2:06:24 PM

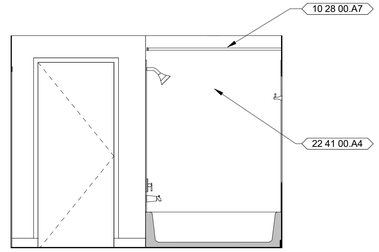
COPYRIGHT©



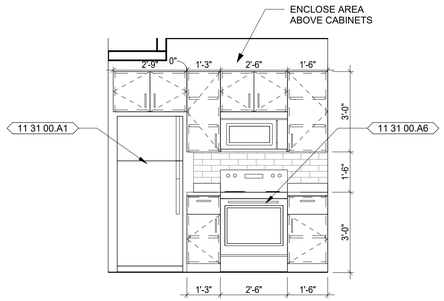
7 BATHROOM ELEVATION
3/8" = 1'-0"



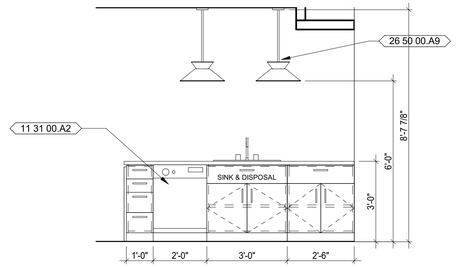
6 UNIT 1.3 - BATHROOM ELEVATION
3/8" = 1'-0"



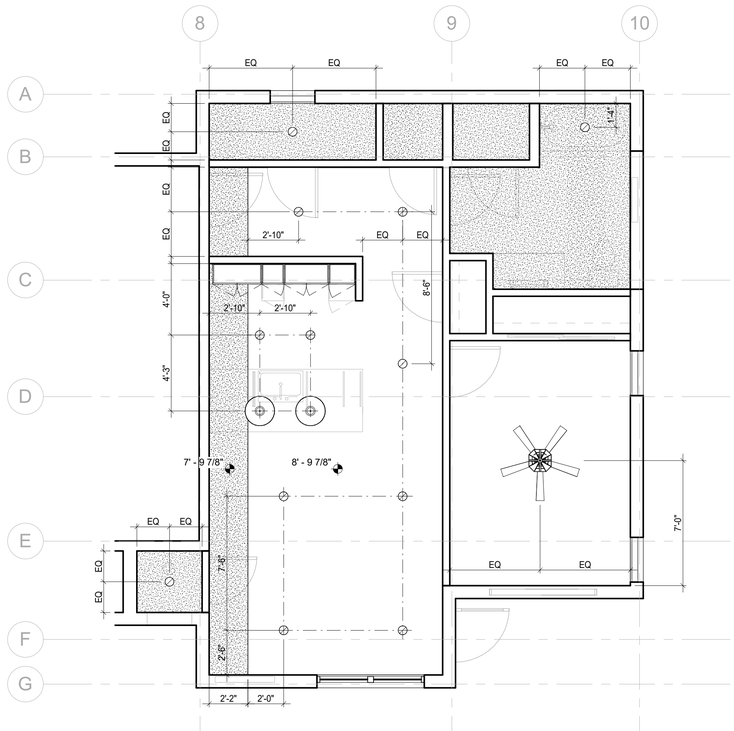
5 BATHROOM ELEVATION
3/8" = 1'-0"



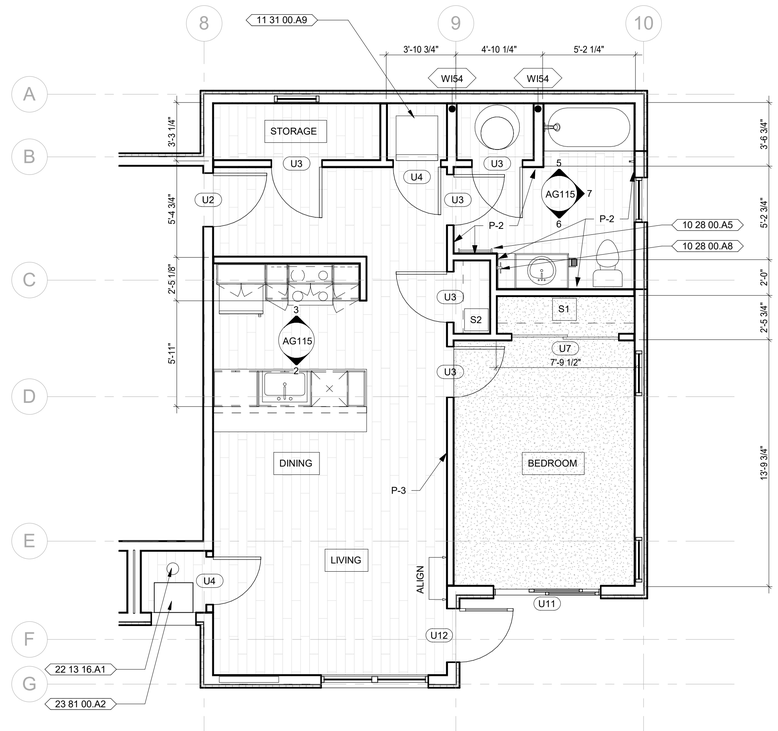
3 KITCHEN ELEVATION
3/8" = 1'-0"



2 KITCHEN ELEVATION
3/8" = 1'-0"



4 RCP
1/4" = 1'-0"



1 FLOOR PLAN
1/4" = 1'-0"

UNIT PLAN NOTES

1. SEE SHEET AG603, FOR GENERAL INTERIOR FINISH NOTES ABBREVIATION KEY AND COMPLETE PRODUCT SPECIFICATION INFORMATION
2. LEVEL 3 KNOCK-DOWN TEXTURE ON ALL WALLS
3. ALL CEILINGS TO BE PAINTED (P-5) UNO
4. ALL UNIT INTERIOR WALLS TO BE PAINTED (P-1) UNO
5. ALL UNIT TRIM, BASE AND DOORS, TO BE PAINTED (P-4) UNO
6. ALL FLOORING TO BE (LVP-1) UNO, IN THE DIRECTION SHOWN IN UNIT PLANS
7. ALL BEDROOM FLOORING TO BE (CPT-1) UNO
8. ALL UNIT WALL BASE TO BE 4" MDF W/EASED EDGE
9. ALL KITCHEN BACKSPLASHES TO BE (T-1) UNO
10. ALL UNIT COUNTERTOPS TO BE (CTP-1) UNO
11. ALL UNIT CABINETS TO BE (CAB-1) UNO
12. ALL UNIT CABINET HARDWARE TO BE (HWD-1) UNO
13. ALL INTERIOR DIMENSIONS ARE TO FACE OF STUD UNLESS NOTED OTHERWISE; FOF - FACE OF FINISH; CL - CENTERLINE
14. WHERE DOORS IN WOOD STUD/GYPSUM BOARD PARTITIONS ARE NOT SPECIFICALLY LOCATED ON THE PLAN WITH DIMENSION STRINGS, PROVIDE A MINIMUM HINGE SIDE JAMB DIMENSION OF 4" FROM DOOR OPENING TO PERPENDICULAR WALLS. WHERE DOORS APPEAR TO BE CENTERED WITHIN HALLWAYS LOCATE THE DOORS IN THE CENTER OF THE HALLWAY.
15. WHERE TWO DIFFERING PARTITION TYPES ABUT IN A LINE AND ALONG A CONTINUOUS LENGTH OF PARTITIONS, THE CONTINUOUS FINISHED SURFACES OF THESE PARTITIONS SHALL ALIGN UNLESS NOTED OTHERWISE.
16. IF FRAMING NEW NON-RATED PARTITIONS TO THE BOTTOM OF THE STRUCTURAL CEILING, AND THOSE PARTITIONS INTERSECT MECHANICAL EQUIPMENT, THEN FRAME AROUND THE MECHANICAL EQUIPMENT ALLOWING CLEARANCES FOR MAINTENANCE. DO NOT FRME TIGHT AGAINST ANY EQUIPMENT THAT MAY CAUSE VIBRATIONS IN THE PARTITION ASSEMBLY. PROVIDE 1/2" CLEARANCE FROM ALL DUCTWORK. NOTIFY ARCHITECT IF A RATED PARTITION INTERSECTS MECHANICAL EQUIPMENT.
17. THERE SHALL BE NO EXPOSED PIPE, DUCTS, ETC. ALL SUCH LINES SHALL BE CONCEALED OR FURRED, UNLESS NOTED AS EXPOSED CONSTRUCTION .
18. ALL INTERIOR PARTITIONS ARE TYPE W/62 UNLESS NOTED OTHERWISE. SEE SHEET AG001 FOR PARTITION TYPES AND WIDTHS. PARTITION TYPES THAT CONTINUE AROUND CORNERS UNLESS INDICATED OTHERWISE.
19. PROVIDE SLIP JOINT CONNECTIONS AT THE TOPS OF ALL PARTITIONS WHICH INTERSECT THE STRUCTURE ABOVE; PROVIDE FIRE SAFING AT ALL SLIP JOINT CONNECTIONS IN FIRE-RATED PARTITIONS. SEE PARTITION TYPES FOR TYPICAL SLIP-JOINT CONNECTION DESIGN. IF AMOUNT OF DEFLECTION TO BE ACCOMODATED IS NOT INDICATED ON STRUCTURAL DRAWINGS, OBTAIN CLARIFICATION FROM ARCHITECT PRIOR TO PROCEEDING.
20. WHERE MECHANICAL WORK PENETRATES ANY COMPONENT OF THE FIRE-RATED ASSEMBLY, PROVIDE THE APPROPRIATE FIRE AND/OR SMOKE DAMPERS.
21. ALL WALLS ARE EITHER PARALLEL OR PERPENDICULAR UNLESS OTHERWISE NOTED. ALL ANGLED WALLS ARE MULTIPLES OF 45 DEGREES UNLESS NOTED OTHERWISE.
22. ALL OUTLETS SHOWN BACK-TO-BACK SHALL BE OFFSET A MINIMUM OF 6". A STUD SHALL SEPERATE OUTLETS IN ACOUSTIC PARTITIONS PROVIDE CEMENTITOUS BACKER UNITS AROUND ALL TILED SHOWER ENCLOSURES AND TUBS. PROVIDE WATER RESISTIVE GYPSUM BOARD AT TOILET ROOM WALLS. MAINTAIN REQUIRED FIRE RATING AT ALL PARTITIONS.

PLAN & RCP SYMBOLS

- 1i — DOOR TAG
- 1t — WINDOW TAG
- ROOM NAME 101 — ROOM TAG
- WE606.1 — WALL TAG RE:ASSEMBLIES
- PENDANT LIGHT
- RECESSED CAN DOWNLIGHT
- CEILING FAN
- DROPPED CEILING
- REMOVABLE CABINET

KEYNOTES

KEY VALUE	KEYNOTE TEXT
10 28 00.A2	TOILET TISSUE DISPENSER
10 28 00.A5	TOWEL BAR
10 28 00.A6	ROBE HOOK
10 28 00.A7	SHOWER CURTAIN ROD
10 28 00.A8	TOWEL RING
10 28 00.A10	FRAMELESS MIRROR W/ BEVELED EDGES
11 31 00.A1	ENERGY STAR, ADA COMPLIANT REFRIGERTOR - RF-1
11 31 00.A2	ENERGY STAR DISHWASHER - DW-1
11 31 00.A6	ELECTRIC RANGE AND OVEN WITH MICROWAVE ABOVE - ER-1
11 31 00.A9	ENERGY STAR STACKABLE WASHER/DRYER, WD-1
22 13 16.A1	FLOOR DRAIN RE: PLUMBING
22 41 00.A4	FIBERGLASS TUB SURROUND, REINFORCED FOR FUTURE INSTALLATION OF GRAB BARS
23 81 00.A2	VTAC UNIT, RE: MECH
26 50 00.A7	VANITY SCONCE LIGHT; RE: ELECTRICAL
26 50 00.A9	DECORATIVE PENDANT LIGHT, RE: ELECTRICAL

SHELVING LEGEND

S1	12" DEEP MDF SHELF AND HANGING ROD
S2	(5) 16" DEEP MDF FIXED SHELVES WITH LEDGER, SPACED 12" O.C.

* ACCESSIBLE UNIT TO INCLUDE ADJUSTABLE MDF SHELVES, INSTEAD OF FIXED

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

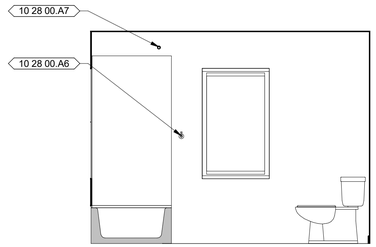
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

UNIT 1.3 - FLOOR PLAN, RCP, & ELEVATIONS

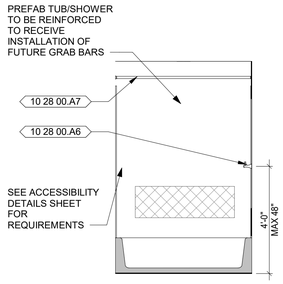
AG115

PLOT DATE: 3/25/2022 2:15:21 PM

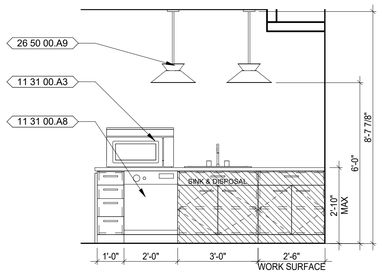
COPYRIGHT©



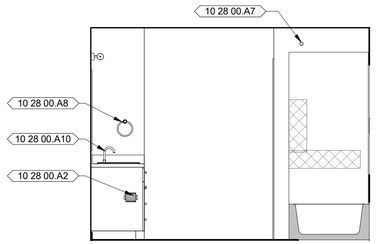
9/ BATHROOM ELEVATION
3/8" = 1'-0"



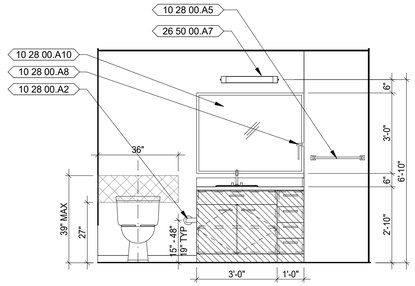
7/ BATHROOM ELEVATION
3/8" = 1'-0"



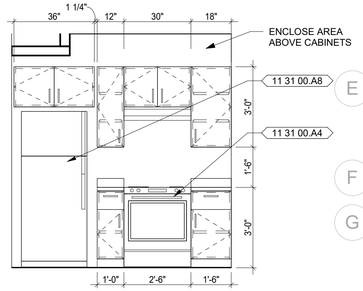
5/ KITCHEN ELEVATION
3/8" = 1'-0"



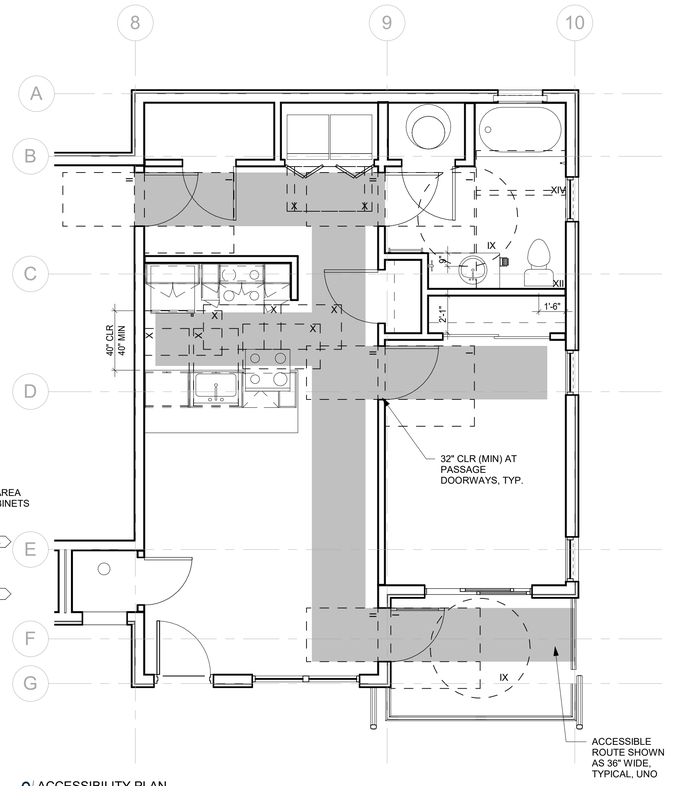
8/ BATHROOM ELEVATION
3/8" = 1'-0"



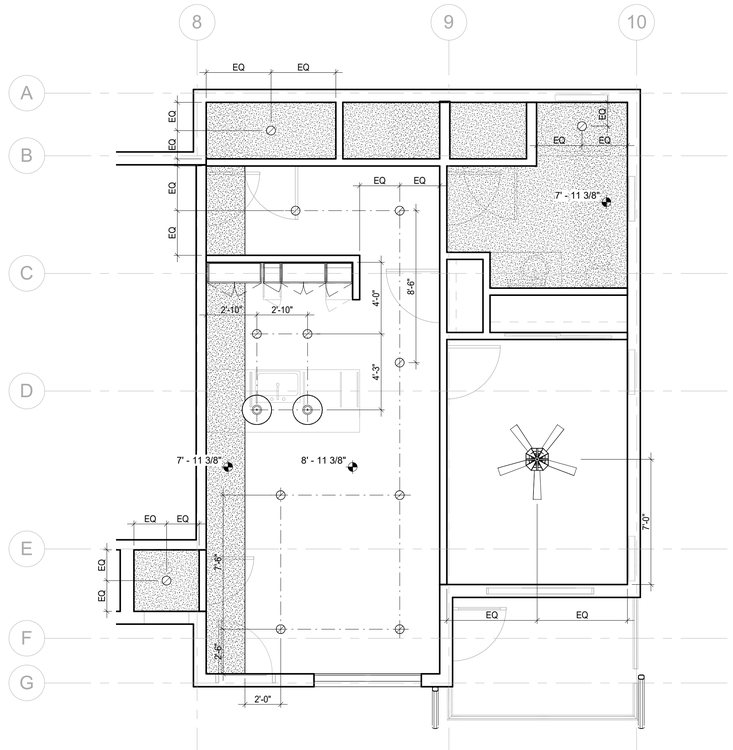
6/ BATHROOM ELEVATION
3/8" = 1'-0"



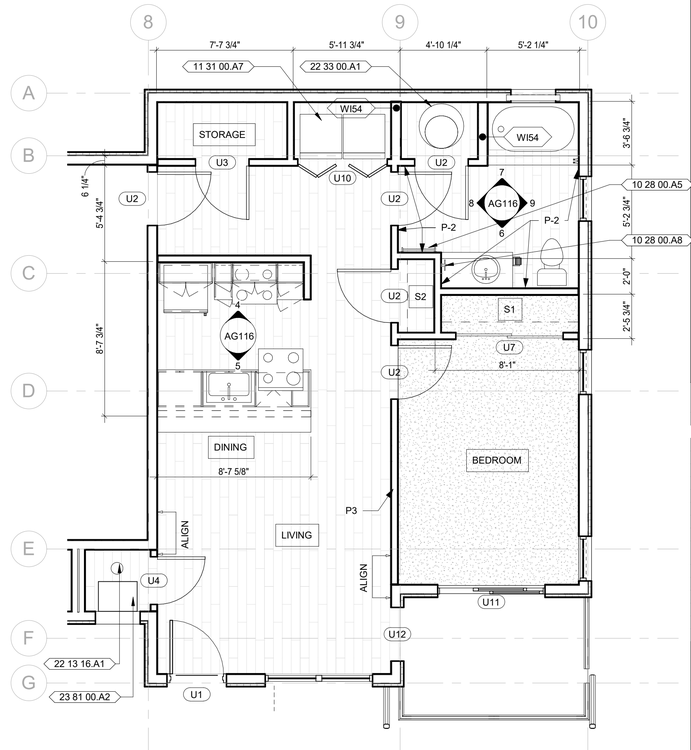
4/ KITCHEN ELEVATION
3/8" = 1'-0"



2/ ACCESSIBILITY PLAN
1/4" = 1'-0"



3/ RCP
1/4" = 1'-0"



1/ FLOOR PLAN
1/4" = 1'-0"

UNIT PLAN NOTES

1. SEE SHEET AG603, FOR GENERAL INTERIOR FINISH NOTES ABBREVIATION KEY AND COMPLETE PRODUCT SPECIFICATION INFORMATION
2. LEVEL 3 KNOCK-DOWN TEXTURE ON ALL WALLS
3. ALL CEILINGS TO BE PAINTED (P-5) UNO
4. ALL UNIT INTERIOR WALLS TO BE PAINTED (P-1) UNO
5. ALL UNIT TRIM, BASE AND DOORS, TO BE PAINTED (P-4) UNO
6. ALL FLOORING TO BE (LVP-1) UNO, IN THE DIRECTION SHOWN IN UNIT PLANS
7. ALL BEDROOM FLOORING TO BE (CPT-1) UNO
8. ALL UNIT WALL BASE TO BE 4" MDF W/EASED EDGE
9. ALL KITCHEN BACKSPLASHES TO BE (T-1) UNO
10. ALL UNIT COUNTERTOPS TO BE (CTP-1) UNO
11. ALL UNIT CABINETS TO BE (CAB-1) UNO
12. ALL UNIT CABINET HARDWARE TO BE (HWD-1) UNO
13. ALL INTERIOR DIMENSIONS ARE TO FACE OF STUD UNLESS NOTED OTHERWISE; FOF - FACE OF FINISH; CL - CENTERLINE
14. WHERE DOORS IN WOOD STUD/GYPSUM BOARD PARTITIONS ARE NOT SPECIFICALLY LOCATED ON THE PLAN WITH DIMENSION STRINGS, PROVIDE A MINIMUM HINGE SIDE JAMB DIMENSION OF 4" FROM DOOR OPENING TO PERPENDICULAR WALLS. WHERE DOORS APPEAR TO BE CENTERED WITHIN HALLWAYS LOCATE THE DOORS IN THE CENTER OF THE HALLWAY.
15. WHERE TWO DIFFERING PARTITION TYPES ABUT IN A LINE AND ALONG A CONTINUOUS LENGTH OF PARTITIONS, THE CONTINUOUS FINISHED SURFACES OF THESE PARTITIONS SHALL ALIGN UNLESS NOTED OTHERWISE.
16. IF FRAMING NEW NON-RATED PARTITIONS TO THE BOTTOM OF THE STRUCTURAL CEILING, AND THOSE PARTITIONS INTERSECT MECHANICAL EQUIPMENT, THEN FRAME AROUND THE MECHANICAL EQUIPMENT ALLOWING CLEARANCES FOR MAINTENANCE. DO NOT FRME TIGHT AGAINST ANY EQUIPMENT THAT MAY CAUSE VIBRATIONS IN THE PARTITION ASSEMBLY. PROVIDE 1/2" CLEARANCE FROM ALL DUCTWORK. NOTIFY ARCHITECT IF A RATED PARTITION INTERSECTS MECHANICAL EQUIPMENT.
17. THERE SHALL BE NO EXPOSED PIPE, DUCTS, ETC. ALL SUCH LINES SHALL BE CONCEALED OR FURRED, UNLESS NOTED AS EXPOSED CONSTRUCTION .
18. ALL INTERIOR PARTITIONS ARE TYPE WI52 UNLESS NOTED OTHERWISE. SEE SHEET AG001 FOR PARTITION TYPES AND WIDTHS. PARTITION TYPES THAT CONTINUE AROUND CORNERS UNLESS INDICATED OTHERWISE.
19. PROVIDE SLIP JOINT CONNECTIONS AT THE TOPS OF ALL PARTITIONS WHICH INTERSECT THE STRUCTURE ABOVE; PROVIDE FIRE SAFING AT ALL SLIP JOINT CONNECTIONS IN FIRE-RATED PARTITIONS. SEE PARTITION TYPES FOR TYPICAL SLIP-JOINT CONNECTION DESIGN. IF AMOUNT OF DEFLECTION TO BE ACCOMODATED IS NOT INDICATED ON STRUCTURAL DRAWINGS, OBTAIN CLARIFICATION FROM ARCHITECT PRIOR TO PROCEEDING.
20. WHERE MECHANICAL WORK PENETRATES ANY COMPONENT OF THE FIRE-RATED ASSEMBLY, PROVIDE THE APPROPRIATE FIRE AND/OR SMOKE DAMPERS.
21. ALL WALLS ARE EITHER PARALLEL OR PERPENDICULAR UNLESS OTHERWISE NOTED. ALL ANGLED WALLS ARE MULTIPLES OF 45 DEGREES UNLESS NOTED OTHERWISE.
22. ALL OUTLETS SHOWN BACK-TO-BACK SHALL BE OFFSET A MINIMUM OF 6". A STUD SHALL SEPERATE OUTLETS IN ACOUSTIC PARTITIONS PROVIDE CEMENTITOUS BACKER UNITS AROUND ALL TILED SHOWER ENCLOSURES AND TUBS. PROVIDE WATER RESISTIVE GYPSUM BOARD AT TOILET ROOM WALLS. MAINTAIN REQUIRED FIRE RATING AT ALL PARTITIONS.

PLAN & RCP SYMBOLS

- 1i — DOOR TAG
- 1t — WINDOW TAG
- ROOM NAME 101 — ROOM TAG
- WE606.1 — WALL TAG RE:ASSEMBLIES
- PENDANT LIGHT
- RECESSED CAN DOWNLIGHT
- CEILING FAN
- DROPPED CEILING
- REMOVABLE CABINET
- REINFORCEMENT FOR FUTURE GRAB BARS

KEYNOTES

KEY VALUE	KEYNOTE TEXT
10 28 00.A2	TOILET TISSUE DISPENSER
10 28 00.A5	TOWEL BAR
10 28 00.A6	ROBE HOOK
10 28 00.A7	SHOWER CURTAIN ROD
10 28 00.A8	TOWEL RING
10 28 00.A10	FRAMELESS MIRROR W/ BEVELED EDGES
11 31 00.A3	ADA COMPLIANT MICROWAVE - MW-1
11 31 00.A4	ADA COMPLIANT ELECTRIC RANGE - ER-1
11 31 00.A7	SIDE-BY-SIDE, ADA COMPLIANT, ENERGY STAR WASHER AND DRYER, WD-2
11 31 00.A8	ADA COMPLIANT, ENERGY STAR DISHWASHER - DW-1
22 13 16.A1	FLOOR DRAIN RE: PLUMBING
22 33 00.A1	ELECTRIC WATER HEATER, RE: PLUMBING
23 81 00.A2	VTAC UNIT, RE: MECH
26 50 00.A7	VANITY SCONCE LIGHT; RE: ELECTRICAL
26 50 00.A9	DECORATIVE PENDANT LIGHT, RE: ELECTRICAL

SHELVING LEGEND

S1	12" DEEP MDF SHELF AND HANGING ROD
S2	(5) 16" DEEP MDF FIXED SHELVES WITH LEDGER, SPACED 12" O.C.

* ACCESSIBLE UNIT TO INCLUDE ADJUSTABLE MDF SHELVES, INSTEAD OF FIXED

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

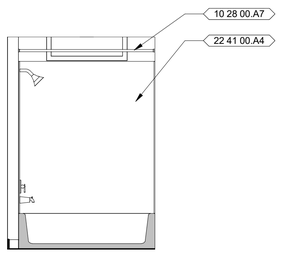
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

UNIT 1.3A - FLOOR PLAN, RCP, & ELEVATIONS

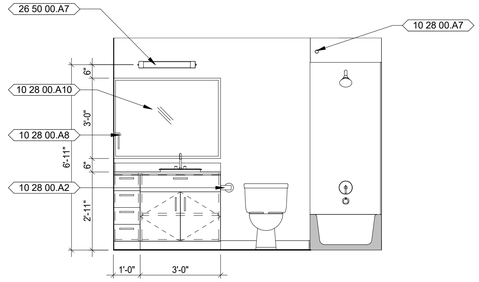
AG116

PLOT DATE: 3/25/2022 2:22:29 PM

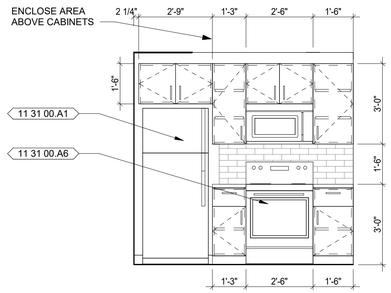
COPYRIGHT©



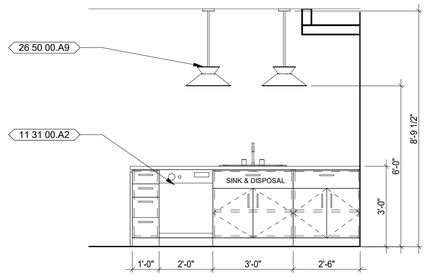
5 BATHROOM ELEVATION
3/8" = 1'-0"



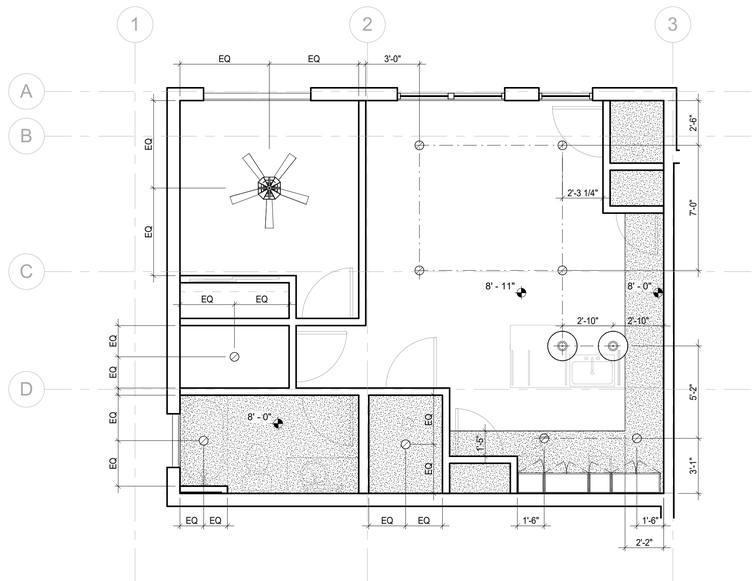
3 BATHROOM ELEVATION
3/8" = 1'-0"



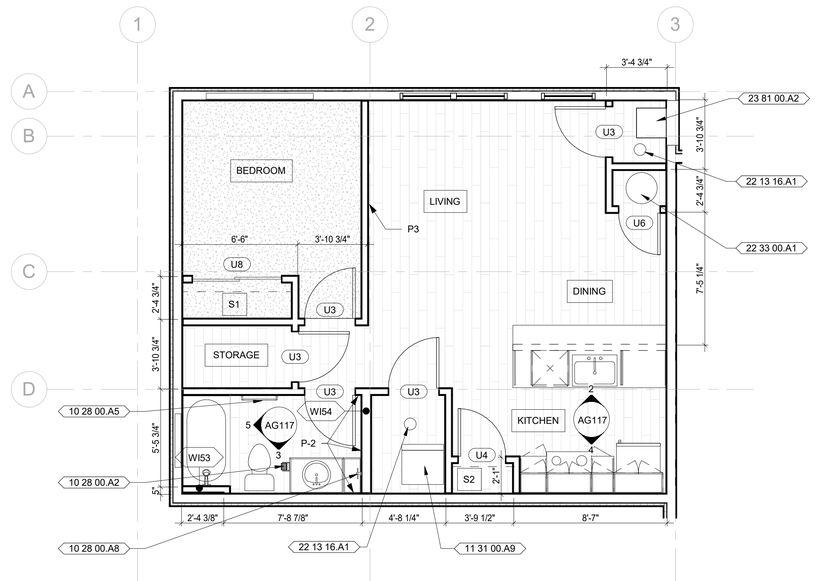
4 KITCHEN ELEVATION
3/8" = 1'-0"



2 KITCHEN ELEVATION
3/8" = 1'-0"



6 UNIT 1.4 - RCP
1/4" = 1'-0"



1 UNIT 1.4 - FLOOR PLAN
1/4" = 1'-0"

UNIT PLAN NOTES

1. SEE SHEET AG603, FOR GENERAL INTERIOR FINISH NOTES ABBREVIATION KEY AND COMPLETE PRODUCT SPECIFICATION INFORMATION
2. LEVEL 3 KNOCK-DOWN TEXTURE ON ALL WALLS
3. ALL CEILINGS TO BE PAINTED (P-5) UNO
4. ALL UNIT INTERIOR WALLS TO BE PAINTED (P-1) UNO
5. ALL UNIT TRIM, BASE AND DOORS, TO BE PAINTED (P-4) UNO
6. ALL FLOORING TO BE (LVP-1) UNO, IN THE DIRECTION SHOWN IN UNIT PLANS
7. ALL BEDROOM FLOORING TO BE (CPT-1) UNO
8. ALL UNIT WALL BASE TO BE 4" MDF W/EASED EDGE
9. ALL KITCHEN BACKSPLASHES TO BE (T-1) UNO
10. ALL UNIT COUNTERTOPS TO BE (CTP-1) UNO
11. ALL UNIT CABINETS TO BE (CAB-1) UNO
12. ALL UNIT CABINET HARDWARE TO BE (HWD-1) UNO
13. ALL INTERIOR DIMENSIONS ARE TO FACE OF STUD UNLESS NOTED OTHERWISE: FOF - FACE OF FINISH; CL - CENTERLINE
14. WHERE DOORS IN WOOD STUD/GYPSUM BOARD PARTITIONS ARE NOT SPECIFICALLY LOCATED ON THE PLAN WITH DIMENSION STRINGS, PROVIDE A MINIMUM HINGE SIDE JAMB DIMENSION OF 4" FROM DOOR OPENING TO PERPENDICULAR WALLS. WHERE DOORS APPEAR TO BE CENTERED WITHIN HALLWAYS LOCATE THE DOORS IN THE CENTER OF THE HALLWAY.
15. WHERE TWO DIFFERING PARTITION TYPES ABUT IN A LINE AND ALONG A CONTINUOUS LENGTH OF PARTITIONS, THE CONTINUOUS FINISHED SURFACES OF THESE PARTITIONS SHALL ALIGN UNLESS NOTED OTHERWISE.
16. IF FRAMING NEW NON-RATED PARTITIONS TO THE BOTTOM OF THE STRUCTURAL CEILING, AND THOSE PARTITIONS INTERSECT MECHANICAL EQUIPMENT, THEN FRAME AROUND THE MECHANICAL EQUIPMENT ALLOWING CLEARANCES FOR MAINTENANCE. DO NOT FRME TIGHT AGAINST ANY EQUIPMENT THAT MAY CAUSE VIBRATIONS IN THE PARTITION ASSEMBLY. PROVIDE 1/2" CLEARANCE FROM ALL DUCTWORK. NOTIFY ARCHITECT IF A RATED PARTITION INTERSECTS MECHANICAL EQUIPMENT.
17. THERE SHALL BE NO EXPOSED PIPE, DUCTS, ETC. ALL SUCH LINES SHALL BE CONCEALED OR FURRED, UNLESS NOTED AS EXPOSED CONSTRUCTION .
18. ALL INTERIOR PARTITIONS ARE TYPE WI52 UNLESS NOTED OTHERWISE. SEE SHEET AG001 FOR PARTITION TYPES AND WIDTHS. PARTITION TYPES THAT CONTINUE AROUND CORNERS UNLESS INDICATED OTHERWISE.
19. PROVIDE SLIP JOINT CONNECTIONS AT THE TOPS OF ALL PARTITIONS WHICH INTERSECT THE STRUCTURE ABOVE; PROVIDE FIRE SAFING AT ALL SLIP JOINT CONNECTIONS IN FIRE-RATED PARTITIONS. SEE PARTITION TYPES FOR TYPICAL SLIP-JOINT CONNECTION DESIGN. IF AMOUNT OF DEFLECTION TO BE ACCOMODATED IS NOT INDICATED ON STRUCTURAL DRAWINGS, OBTAIN CLARIFICATION FROM ARCHITECT PRIOR TO PROCEEDING.
20. WHERE MECHANICAL WORK PENETRATES ANY COMPONENT OF THE FIRE-RATED ASSEMBLY, PROVIDE THE APPROPRIATE FIRE AND/OR SMOKE DAMPERS.
21. ALL WALLS ARE EITHER PARALLEL OR PERPENDICULAR UNLESS OTHERWISE NOTED. ALL ANGLED WALLS ARE MULTIPLES OF 45 DEGREES UNLESS NOTED OTHERWISE.
22. ALL OUTLETS SHOWN BACK-TO-BACK SHALL BE OFFSET A MINIMUM OF 6". A STUD SHALL SEPERATE OUTLETS IN ACOUSTIC PARTITIONS PROVIDE CEMENTITOUS BACKER UNITS AROUND ALL TILED SHOWER ENCLOSURES AND TUBS. PROVIDE WATER RESISTIVE GYPSUM BOARD AT TOILET ROOM WALLS. MAINTAIN REQUIRED FIRE RATING AT ALL PARTITIONS.

PLAN & RCP SYMBOLS

- 1i — DOOR TAG
- 1t — WINDOW TAG
- ROOM NAME / 101 — ROOM TAG
- WE606.1 — WALL TAG RE:ASSEMBLIES
- PENDANT LIGHT
- RECESSED CAN DOWNLIGHT
- CEILING FAN
- DROPPED CEILING
- REMOVABLE CABINET

KEYNOTES

KEY VALUE	KEYNOTE TEXT
10 28 00.A2	TOILET TISSUE DISPENSER
10 28 00.A5	TOWEL BAR
10 28 00.A7	SHOWER CURTAIN ROD
10 28 00.A8	TOWEL RING
10 28 00.A10	FRAMELESS MIRROR W/ BEVELED EDGES
11 31 00.A1	ENERGY STAR, ADA COMPLIANT REFRIGERTOR - RF-1
11 31 00.A2	ENERGY STAR DISHWASHER - DW-1
11 31 00.A6	ELECTRIC RANGE AND OVEN WITH MICROWAVE ABOVE - ER-1
11 31 00.A9	ENERGY STAR STACKABLE WASHER/DRYER, WD-1
22 13 16.A1	FLOOR DRAIN RE: PLUMBING
22 33 00.A1	ELECTRIC WATER HEATER, RE: PLUMBING
22 41 00.A4	FIBERGLASS TUB SURROUND, REINFORCED FOR FUTURE INSTALLATION OF GRAB BARS
23 81 00.A2	VTAC UNIT, RE: MECH
26 50 00.A7	VANITY SCONCE LIGHT; RE: ELECTRICAL
26 50 00.A9	DECORATIVE PENDANT LIGHT, RE: ELECTRICAL

SHELVING LEGEND

S1	12" DEEP MDF SHELF AND HANGING ROD
S2	(5) 16" DEEP MDF FIXED SHELVES WITH LEDGER, SPACED 12" O.C.

* ACCESSIBLE UNIT TO INCLUDE ADJUSTABLE MDF SHELVES, INSTEAD OF FIXED

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

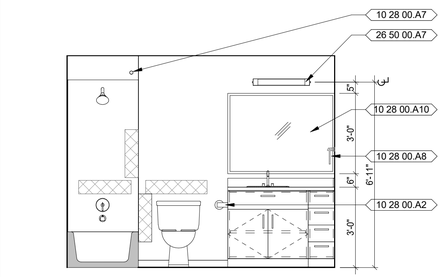
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

UNIT 1.4 - FLOOR PLAN, RCP, & ELEVATIONS

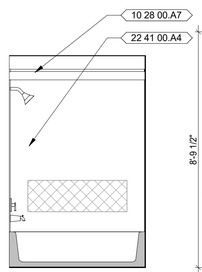
AG117

PLOT DATE: 3/25/2022 2:26:08 PM

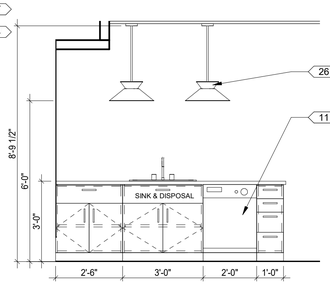
COPYRIGHT©



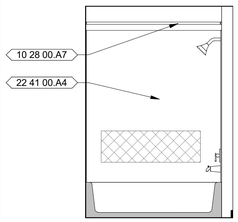
9 BATHROOM ELEVATION
3/8" = 1'-0"

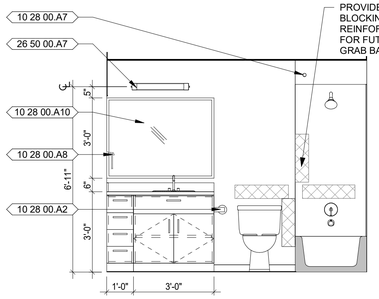


7 BATHROOM ELEVATION
3/8" = 1'-0"



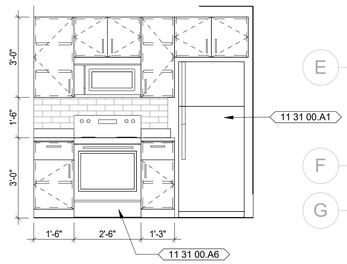
5 KITCHEN ELEVATION
3/8" = 1'-0"



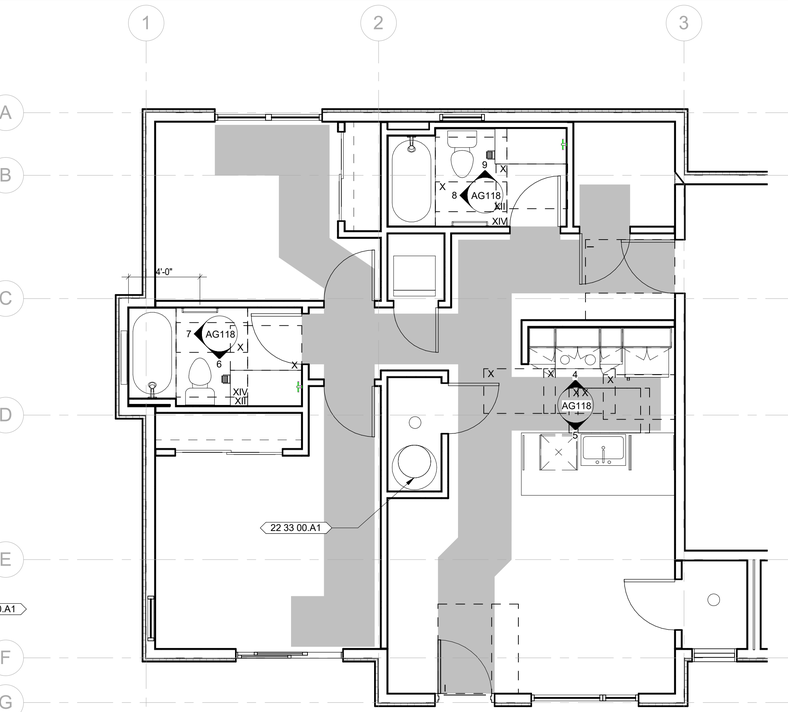


8 BATHROOM ELEVATION
3/8" = 1'-0"

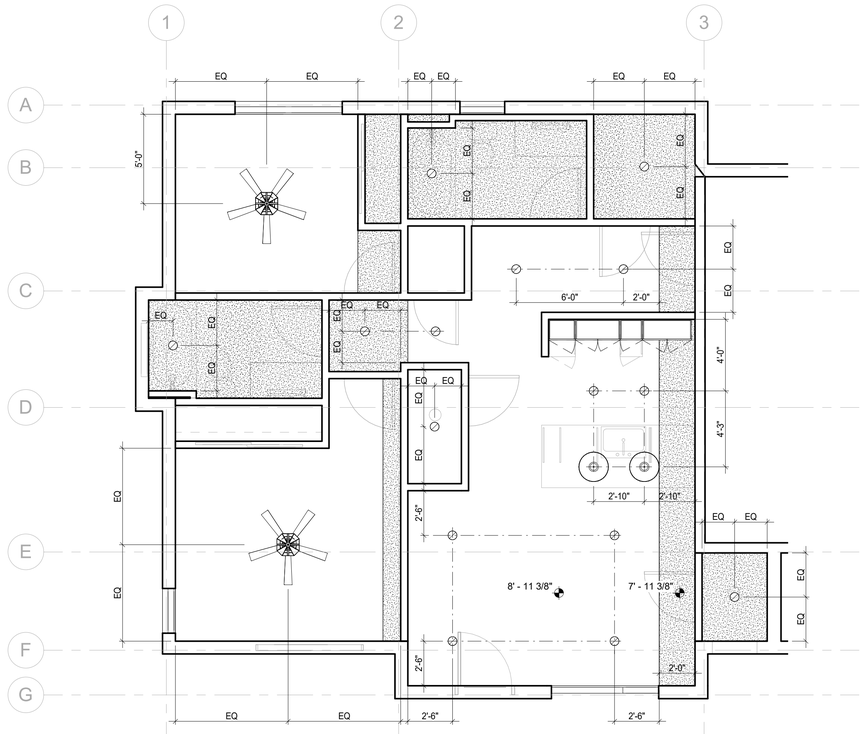
6 BATHROOM ELEVATION
3/8" = 1'-0"



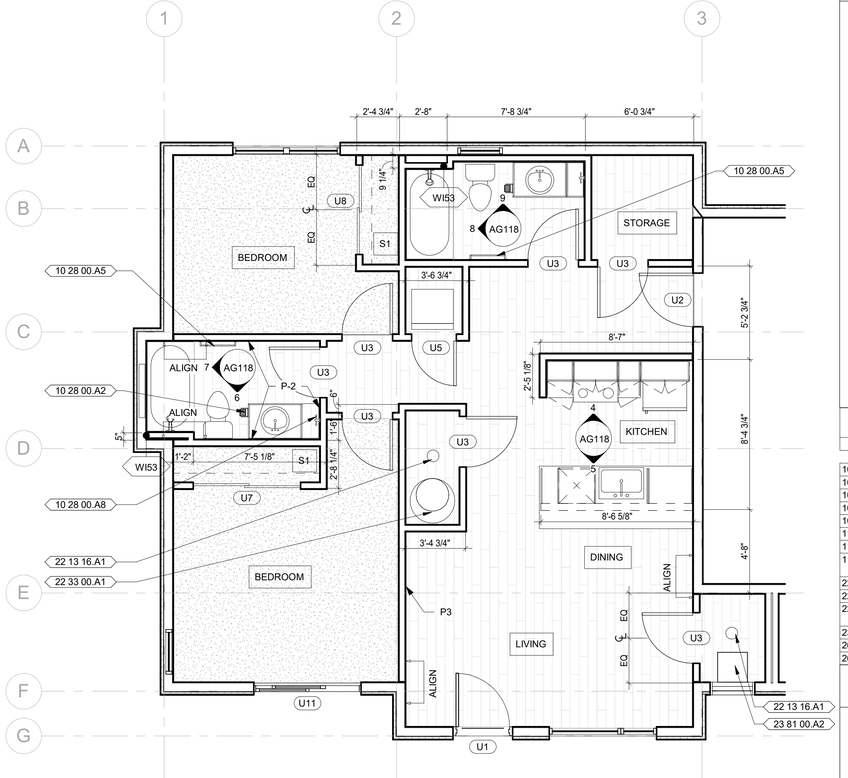
4 KITCHEN ELEVATION
3/8" = 1'-0"



2 UNIT 2.1 - ACCESSIBILITY PLAN
1/4" = 1'-0"



3 UNIT 2.1 - LEVEL RCP
1/4" = 1'-0"



1 UNIT 2.1 - FLOOR PLAN
1/4" = 1'-0"

UNIT PLAN NOTES

1. SEE SHEET AG603, FOR GENERAL INTERIOR FINISH NOTES ABBREVIATION KEY AND COMPLETE PRODUCT SPECIFICATION INFORMATION
2. LEVEL 3 KNOCK-DOWN TEXTURE ON ALL WALLS
3. ALL CEILINGS TO BE PAINTED (P-5) UNO
4. ALL UNIT INTERIOR WALLS TO BE PAINTED (P-1) UNO
5. ALL UNIT TRIM, BASE AND DOORS, TO BE PAINTED (P-4) UNO
6. ALL FLOORING TO BE (LVP-1) UNO, IN THE DIRECTION SHOWN IN UNIT PLANS
7. ALL BEDROOM FLOORING TO BE (CPT-1) UNO
8. ALL UNIT WALL BASE TO BE 4" MDF W/EASED EDGE
9. ALL KITCHEN BACKSPLASHES TO BE (T-1) UNO
10. ALL UNIT COUNTERTOPS TO BE (CTP-1) UNO
11. ALL UNIT CABINETS TO BE (CAB-1) UNO
12. ALL UNIT CABINET HARDWARE TO BE (HWD-1) UNO
13. ALL INTERIOR DIMENSIONS ARE TO FACE OF STUD UNLESS NOTED OTHERWISE; FOF - FACE OF FINISH; CL - CENTERLINE
14. WHERE DOORS IN WOOD STUD/GYPSUM BOARD PARTITIONS ARE NOT SPECIFICALLY LOCATED ON THE PLAN WITH DIMENSION STRINGS, PROVIDE A MINIMUM HINGE SIDE JAMB DIMENSION OF 4" FROM DOOR OPENING TO PERPENDICULAR WALLS. WHERE DOORS APPEAR TO BE CENTERED WITHIN HALLWAYS LOCATE THE DOORS IN THE CENTER OF THE HALLWAY.
15. WHERE TWO DIFFERING PARTITION TYPES ABUT IN A LINE AND ALONG A CONTINUOUS LENGTH OF PARTITIONS, THE CONTINUOUS FINISHED SURFACES OF THESE PARTITIONS SHALL ALIGN UNLESS NOTED OTHERWISE.
16. IF FRAMING NEW NON-RATED PARTITIONS TO THE BOTTOM OF THE STRUCTURAL CEILING, AND THOSE PARTITIONS INTERSECT MECHANICAL EQUIPMENT, THEN FRAME AROUND THE MECHANICAL EQUIPMENT ALLOWING CLEARANCES FOR MAINTENANCE. DO NOT FRME TIGHT AGAINST ANY EQUIPMENT THAT MAY CAUSE VIBRATIONS IN THE PARTITION ASSEMBLY. PROVIDE 1/2" CLEARANCE FROM ALL DUCTWORK. NOTIFY ARCHITECT IF A RATED PARTITION INTERSECTS MECHANICAL EQUIPMENT.
17. THERE SHALL BE NO EXPOSED PIPE, DUCTS, ETC. ALL SUCH LINES SHALL BE CONCEALED OR FURRED, UNLESS NOTED AS EXPOSED CONSTRUCTION .
18. ALL INTERIOR PARTITIONS ARE TYPE WI52 UNLESS NOTED OTHERWISE. SEE SHEET AG001 FOR PARTITION TYPES AND WIDTHS. PARTITION TYPES THAT CONTINUE AROUND CORNERS UNLESS INDICATED OTHERWISE.
19. PROVIDE SLIP JOINT CONNECTIONS AT THE TOPS OF ALL PARTITIONS WHICH INTERSECT THE STRUCTURE ABOVE; PROVIDE FIRE SAFING AT ALL SLIP JOINT CONNECTIONS IN FIRE-RATED PARTITIONS. SEE PARTITION TYPES FOR TYPICAL SLIP-JOINT CONNECTION DESIGN. IF AMOUNT OF DEFLECTION TO BE ACCOMODATED IS NOT INDICATED ON STRUCTURAL DRAWINGS, OBTAIN CLARIFICATION FROM ARCHITECT PRIOR TO PROCEEDING.
20. WHERE MECHANICAL WORK PENETRATES ANY COMPONENT OF THE FIRE-RATED ASSEMBLY, PROVIDE THE APPROPRIATE FIRE AND/OR SMOKE DAMPERS.
21. ALL WALLS ARE EITHER PARALLEL OR PERPENDICULAR UNLESS OTHERWISE NOTED. ALL ANGLED WALLS ARE MULTIPLES OF 45 DEGREES UNLESS NOTED OTHERWISE.
22. ALL OUTLETS SHOWN BACK-TO-BACK SHALL BE OFFSET A MINIMUM OF 6". A STUD SHALL SEPERATE OUTLETS IN ACOUSTIC PARTITIONS PROVIDE CEMENTITOUS BACKER UNITS AROUND ALL TILED SHOWER ENCLOSURES AND TUBS. PROVIDE WATER RESISTIVE GYPSUM BOARD AT TOILET ROOM WALLS. MAINTAIN REQUIRED FIRE RATING AT ALL PARTITIONS.

PLAN & RCP SYMBOLS

1i	DOOR TAG
1t	WINDOW TAG
ROOM NAME 101	ROOM TAG
WE606.1	WALL TAG RE:ASSEMBLIES
	PENDANT LIGHT
	RECESSED CAN DOWNLIGHT
	CEILING FAN
	DROPPED CEILING
	REMOVABLE CABINET
	REINFORCEMENT FOR FUTURE GRAB BARS

KEYNOTES

Key Value	Keynote Text
10 28 00.A2	TOILET TISSUE DISPENSER
10 28 00.A5	TOWEL BAR
10 28 00.A7	SHOWER CURTAIN ROD
10 28 00.A8	TOWEL RING
10 28 00.A10	FRAMELESS MIRROR W/ BEVELED EDGES
11 31 00.A1	ENERGY STAR, ADA COMPLIANT REFRIGERTOR - RF-1
11 31 00.A2	ENERGY STAR DISHWASHER - DW-1
11 31 00.A6	ELECTRIC RANGE AND OVEN WITH MICROWAVE ABOVE - ER-1
22 13 16.A1	FLOOR DRAIN RE: PLUMBING
22 33 00.A1	ELECTRIC WATER HEATER, RE: PLUMBING
22 41 00.A4	FIBERGLASS TUB SURROUND, REINFORCED FOR FUTURE INSTALLATION OF GRAB BARS
23 81 00.A2	VTAC UNIT, RE: MECH
26 50 00.A7	VANITY SCONCE LIGHT; RE: ELECTRICAL
26 50 00.A9	DECORATIVE PENDANT LIGHT, RE: ELECTRICAL

SHELVING LEGEND

S1	12" DEEP MDF SHELF AND HANGING ROD
S2	(5) 16" DEEP MDF FIXED SHELVES WITH LEDGER, SPACED 12" O.C.

* ACCESSIBLE UNIT TO INCLUDE ADJUSTABLE MDF SHELVES, INSTEAD OF FIXED

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

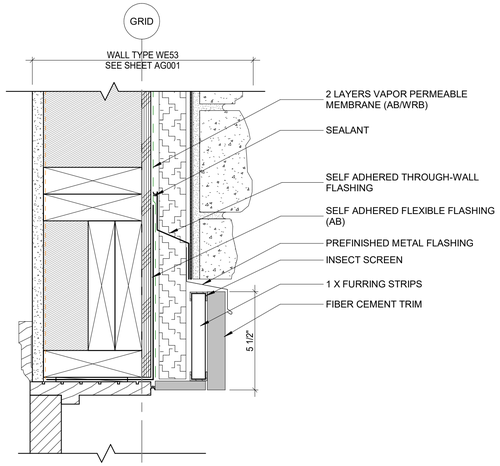
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

UNIT 2.1 - FLOOR PLAN, RCP, & ELEVATIONS

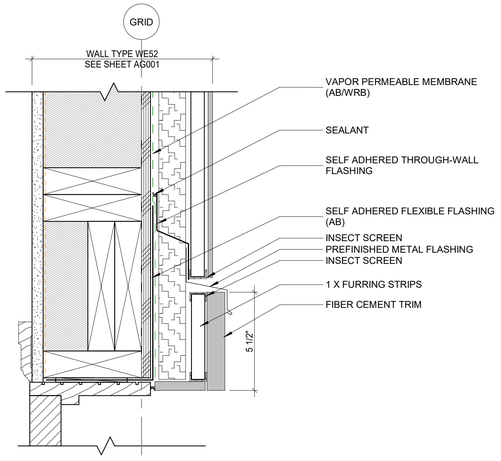
AG118

PLOT DATE: 3/25/2022 2:30:34 PM

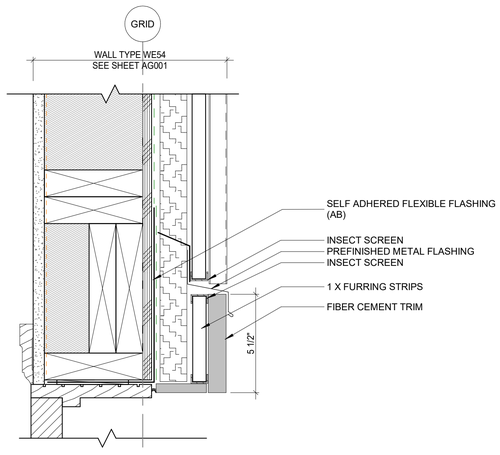
COPYRIGHT©



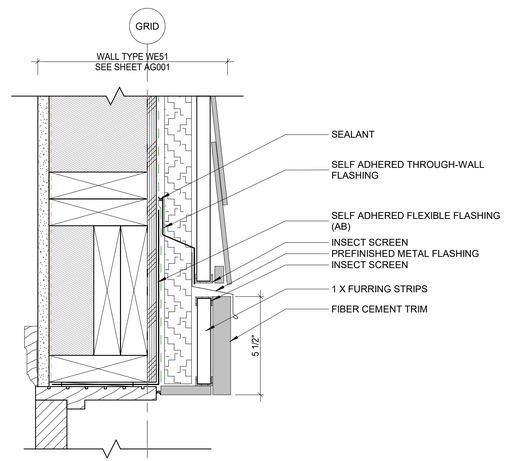
3 DOOR HEAD @ STONE VENEER
3" = 1'-0"



2 DOOR HEAD @ FIBER CEMENT BOARD & BATTEN
3" = 1'-0"



4 DOOR HEAD @ CORRUGATED METAL
3" = 1'-0"



1 DOOR HEAD @ FIBER CEMENT LAP SIDING
3" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

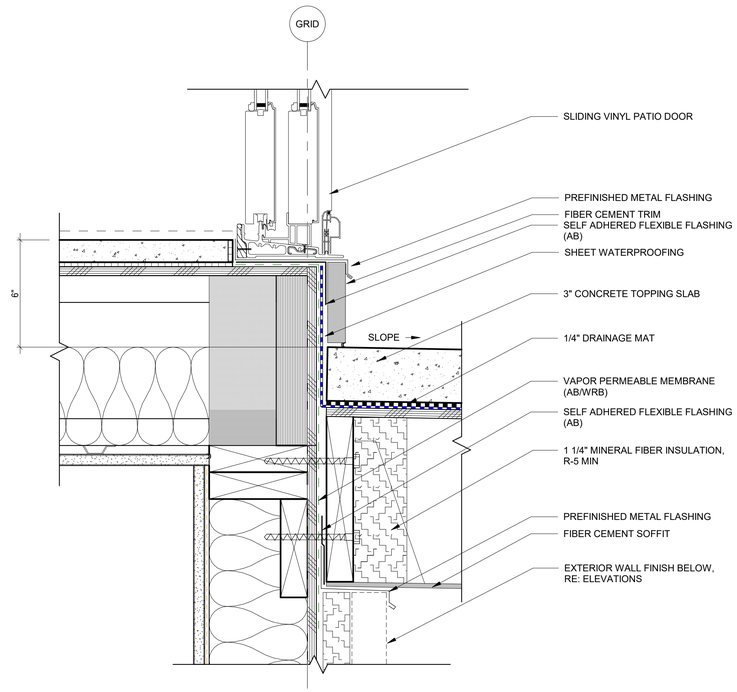
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

DOOR HEAD DETAILS

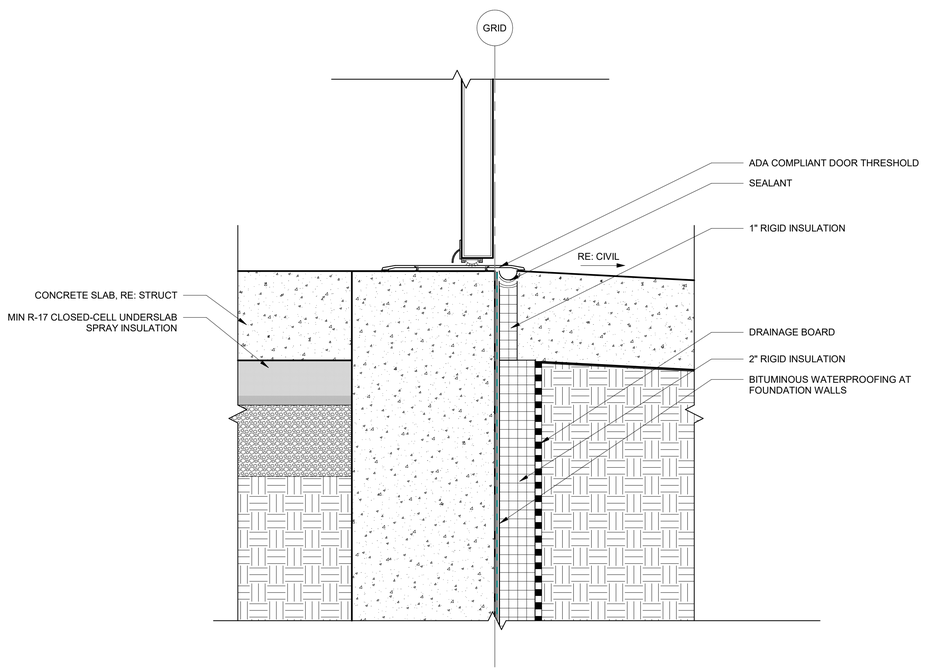
AG501

PLOT DATE: 3/28/2022 3:03:27 PM

COPYRIGHT©



2 DOOR THRESHOLD @ DECK SLIDING BALCONY DOOR
3" = 1'-0"



1 DOOR THRESHOLD @ FRONT ENTRYWAY
3" = 1'-0"

PLOT DATE: 3/28/2022 3:03:27 PM

COPYRIGHT©

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

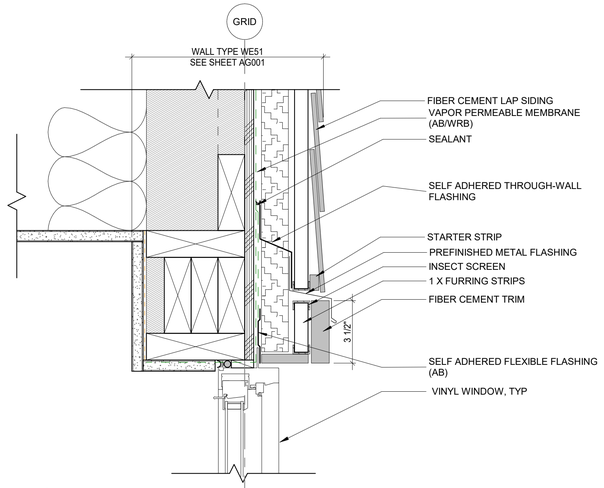
Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

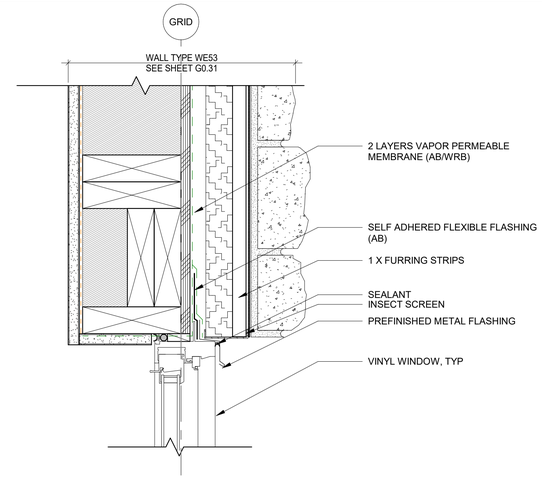
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

DOOR THRESHOLD DETAILS

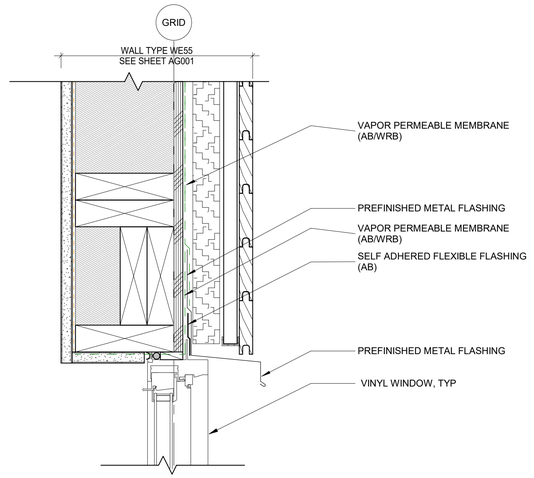
AG502



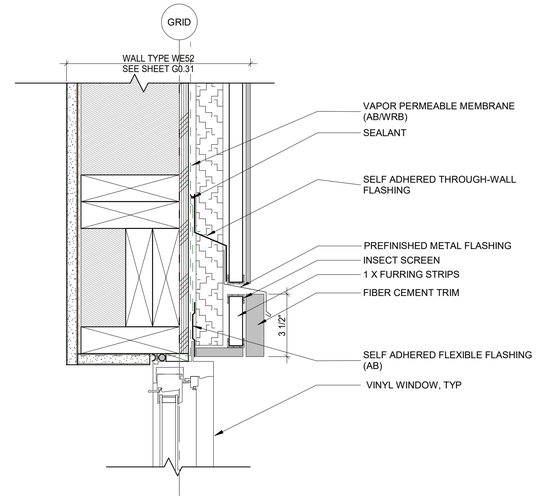
6 WINDOW HEAD @ WINDOW TYPE A4
3" = 1'-0"



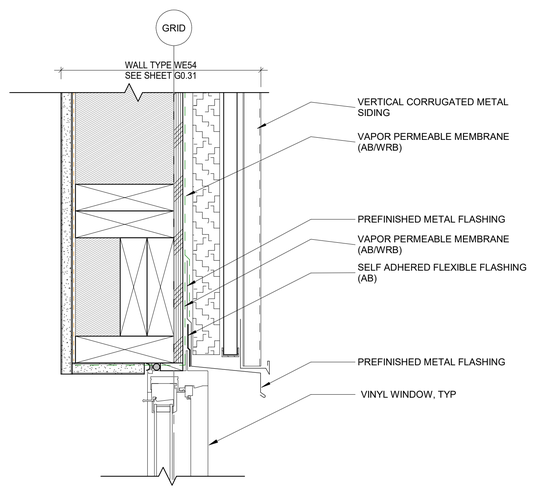
3 WINDOW HEAD @ STONE VENEER
3" = 1'-0"



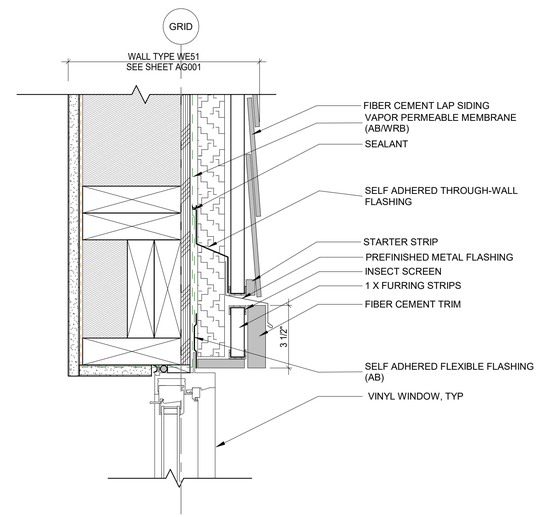
5 WINDOW HEAD @ T&G CEDAR SIDING
3" = 1'-0"



2 WINDOW HEAD @ FIBER CEMENT BOARD & BATTEN
3" = 1'-0"



4 WINDOW HEAD @ CORRUGATED METAL
3" = 1'-0"



1 WINDOW HEAD @ FIBER CEMENT LAP SIDING
3" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

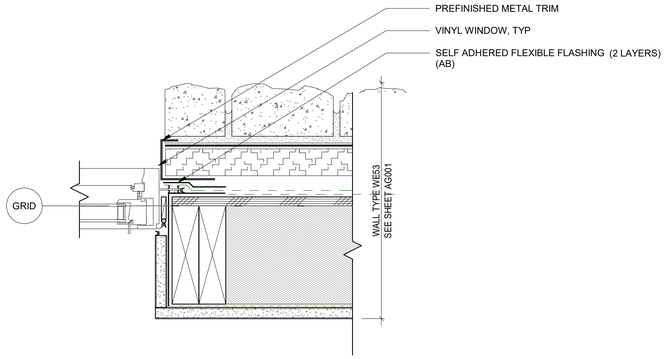
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors exceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

WINDOW HEAD DETAILS

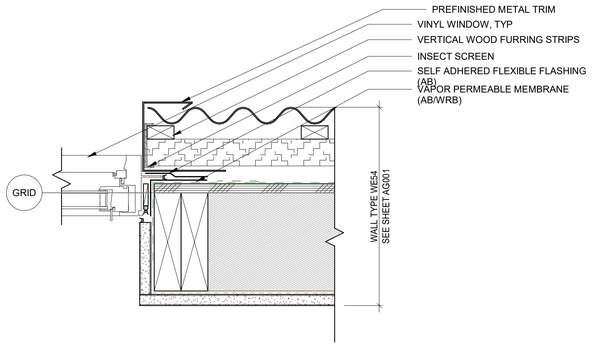
AG503

PLOT DATE: 3/28/2022 3:03:28 PM

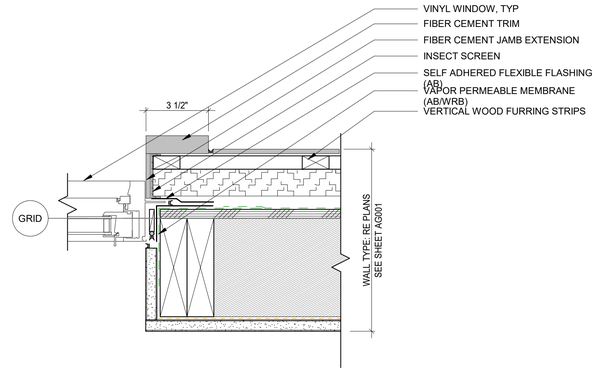
COPYRIGHT©



3 WINDOW JAMB @ STONE VENEER
3" = 1'-0"



4 WINDOW JAMB @ CORRUGATED METAL
3" = 1'-0"



2 WINDOW JAMB @ FIBER CEMENT
3" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

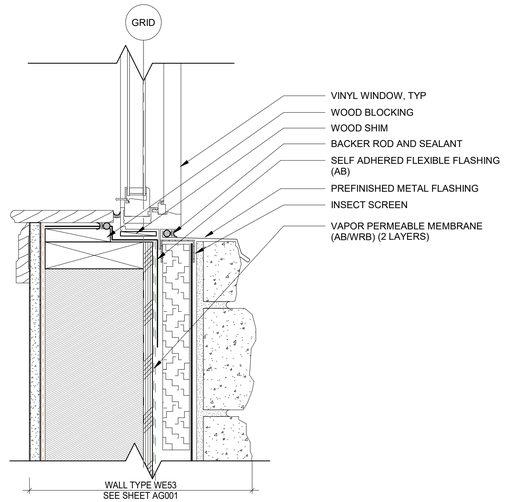
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

WINDOW JAMB DETAILS

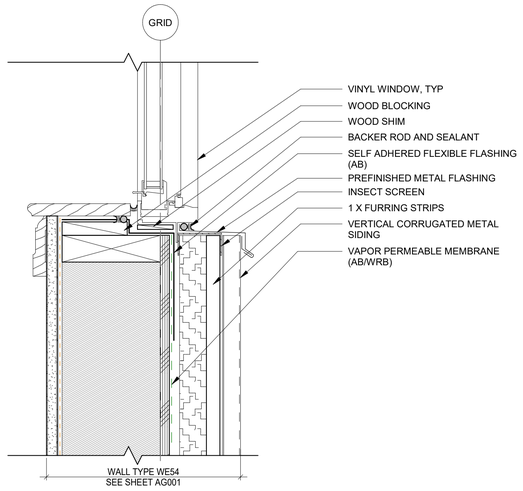
AG504

PLOT DATE: 3/28/2022 3:03:29 PM

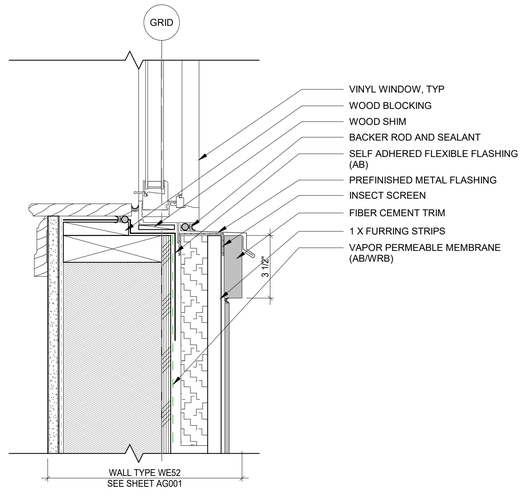
COPYRIGHT©



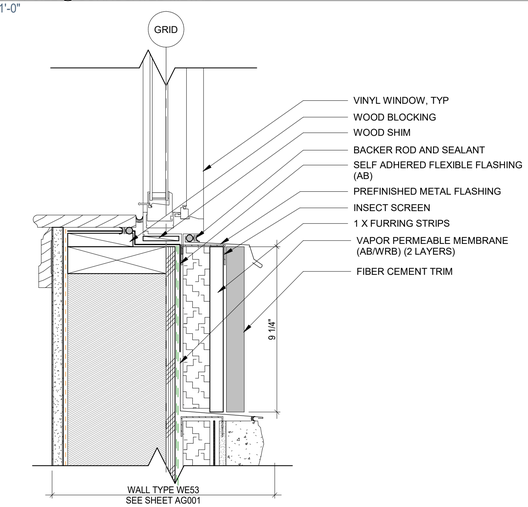
3 WINDOW SILL @ STONE VENEER
3" = 1'-0"



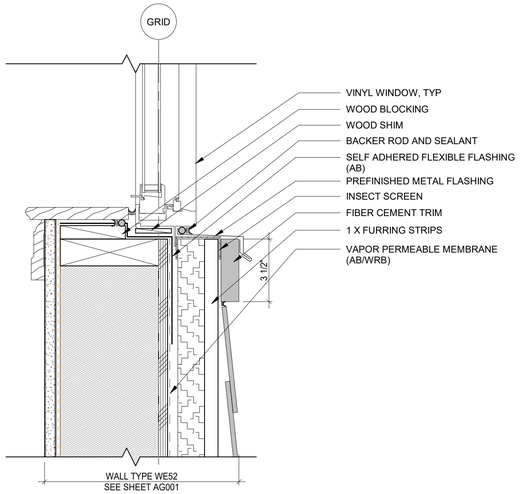
4 WINDOW SILL @ CORRUGATED METAL
3" = 1'-0"



2 WINDOW SILL @ FIBER CEMENT
3" = 1'-0"



6 WINDOW SILL @ STONE VENEER WITH TRIM
3" = 1'-0"



1 WINDOW SILL @ FIBER CEMENT LAP SIDING
3" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

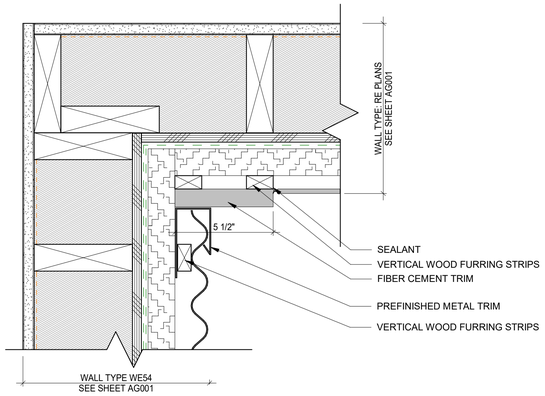
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

WINDOW SILL DETAILS

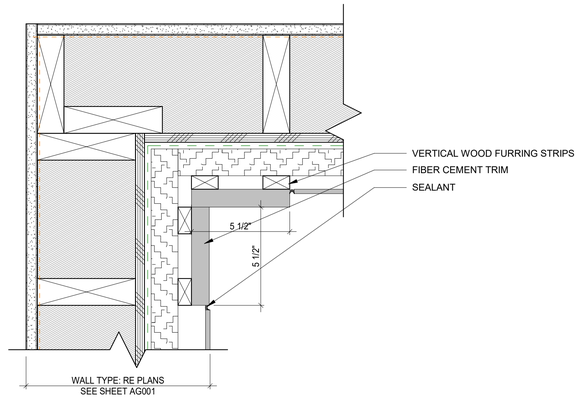
AG505

PLOT DATE: 3/28/2022, 3:03:30 PM

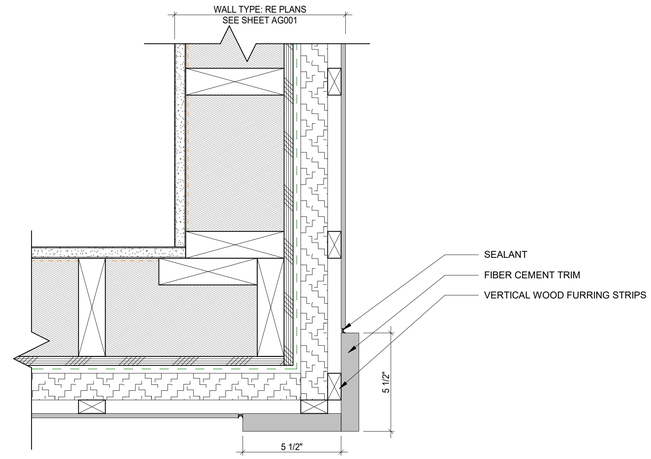
COPYRIGHT©



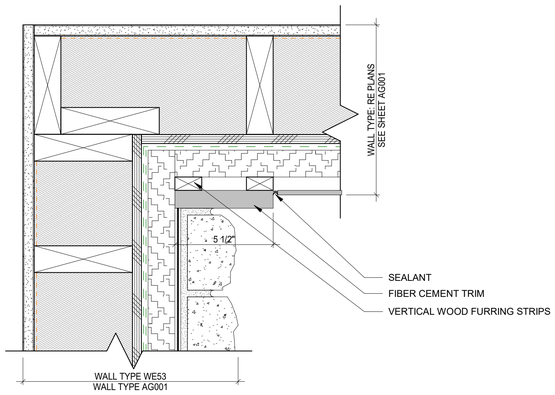
9 INSIDE CORNER @ CORRUGATED METAL & FIBER CEMENT SIDING
3" = 1'-0"



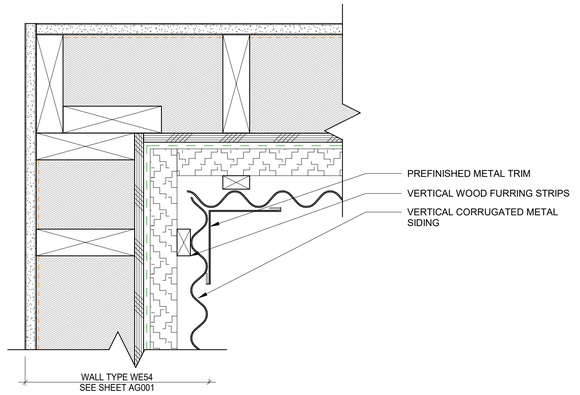
7 INSIDE CORNER @ FIBER CEMENT SIDING
3" = 1'-0"



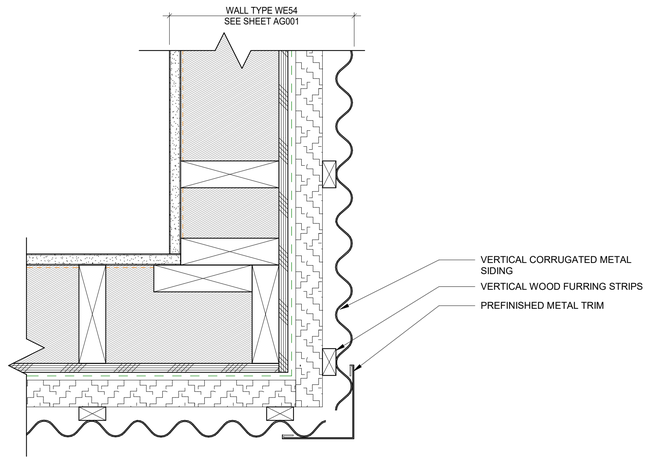
6 OUTSIDE CORNER @ FIBER CEMENT SIDING
3" = 1'-0"



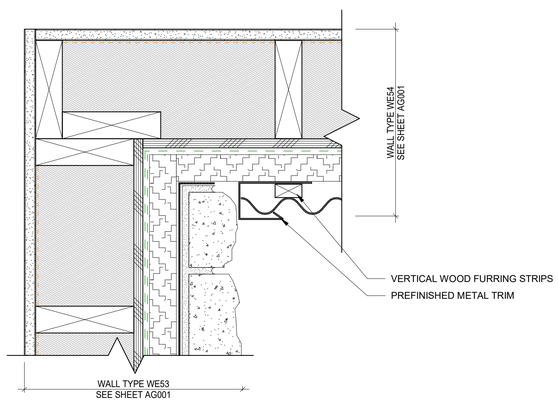
8 INSIDE CORNER @ STONE VENEER & FIBER CEMENT SIDING
3" = 1'-0"



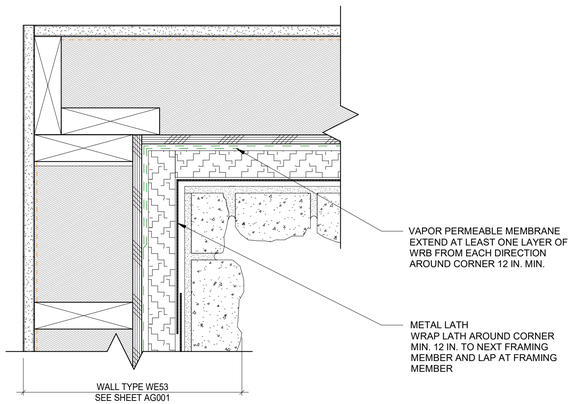
4 INSIDE CORNER @ CORRUGATED METAL
3" = 1'-0"



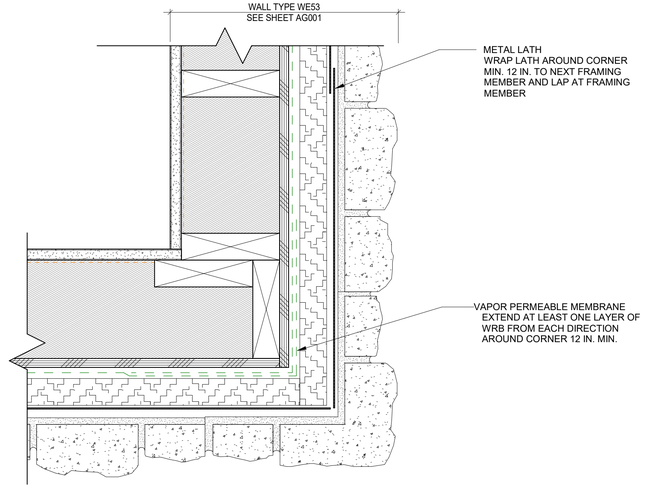
3 OUTSIDE CORNER @ CORRUGATED METAL
3" = 1'-0"



5 INSIDE CORNER @ STONE VENEER & CORRUGATED METAL
3" = 1'-0"



2 INSIDE CORNER @ STONE VENEER
3" = 1'-0"



1 OUTSIDE CORNER @ STONE VENEER
3" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

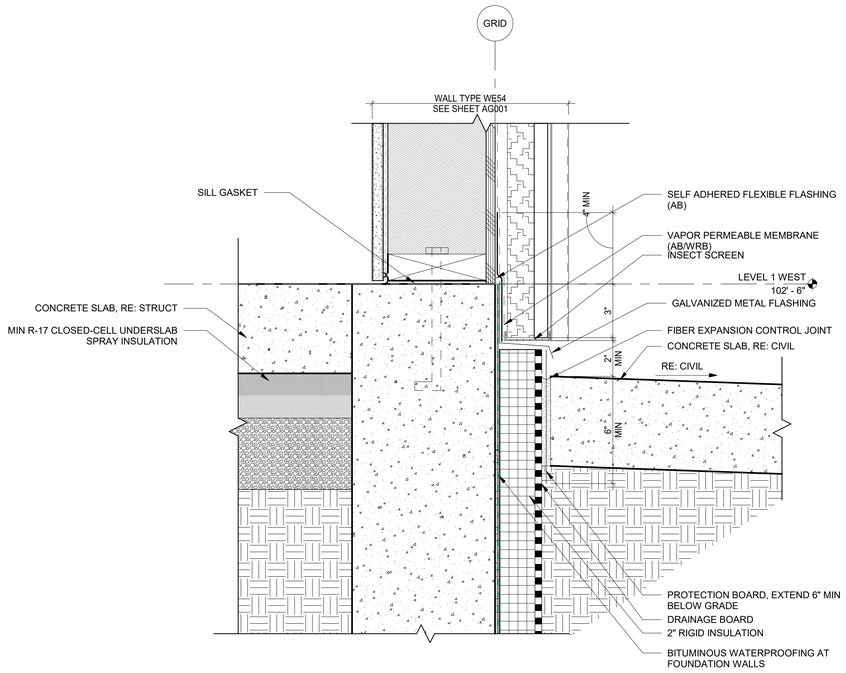
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

PLAN DETAILS

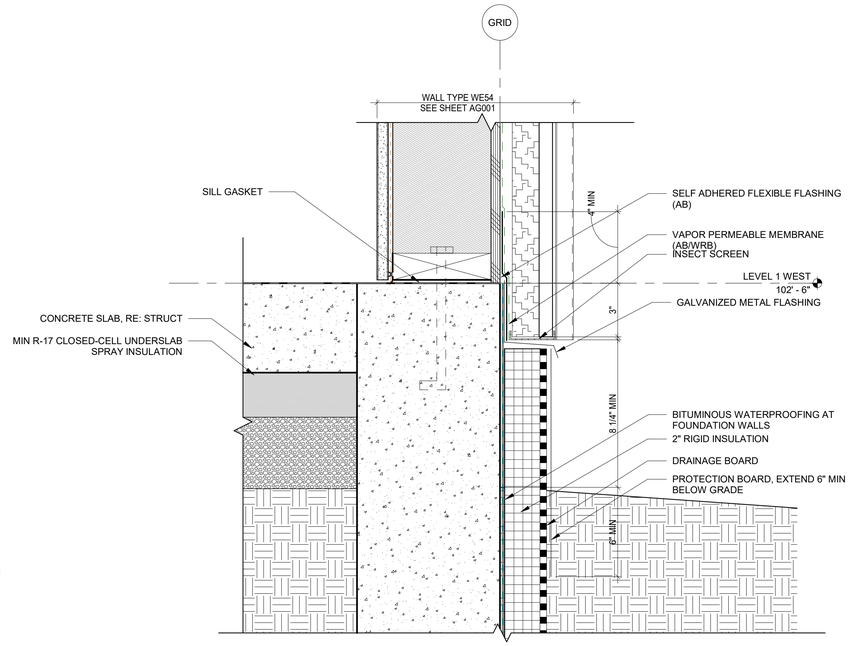
AG511

PLOT DATE: 3/28/2022 3:03:30 PM

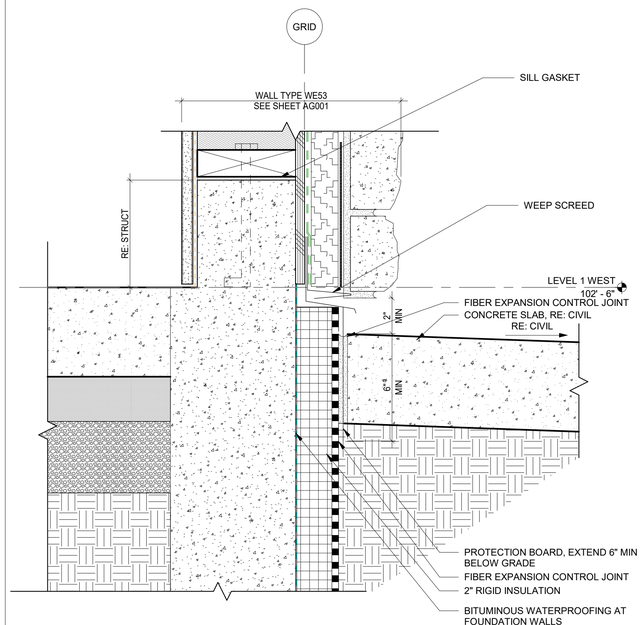
COPYRIGHT©



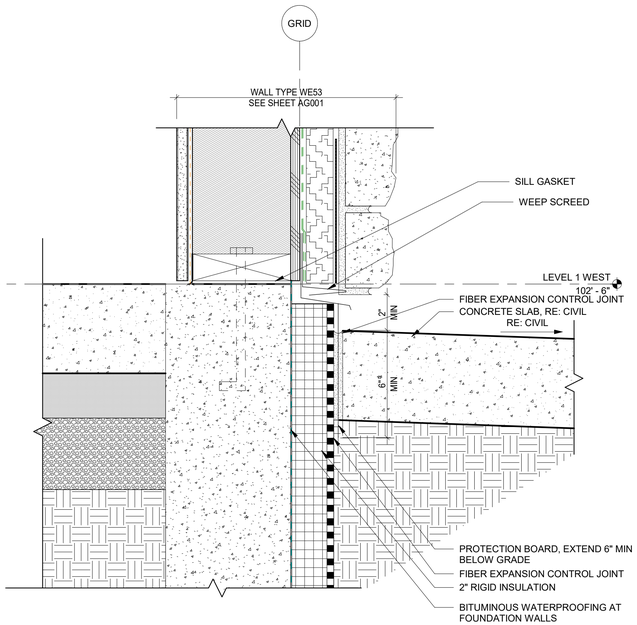
4 FOUNDATION @ CORRUGATED METAL @ PAVEMENT
3" = 1'-0"



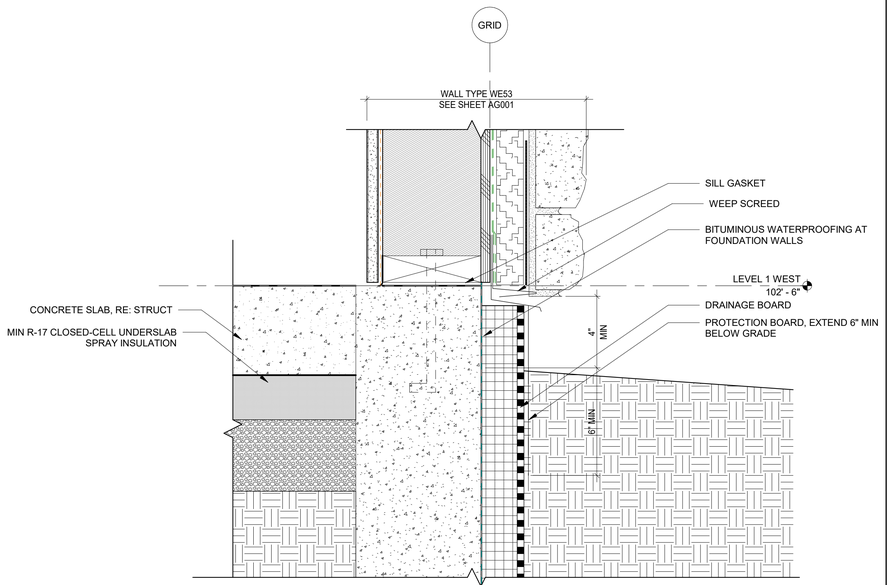
2 FOUNDATION @ CORRUGATED METAL
3" = 1'-0"



5 FOUNDATION @ STONE VENEER W/ STEM WALL
3" = 1'-0"



3 FOUNDATION @ STONE VENEER @ PAVEMENT
3" = 1'-0"



1 FOUNDATION @ STONE VENEER
3" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

0" 1" THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

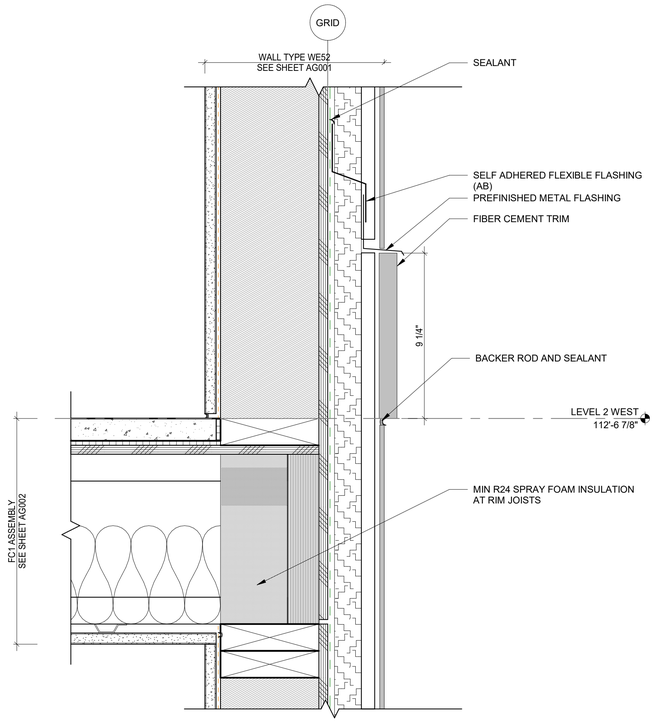
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

SECTION DETAILS @ FOUNDATION

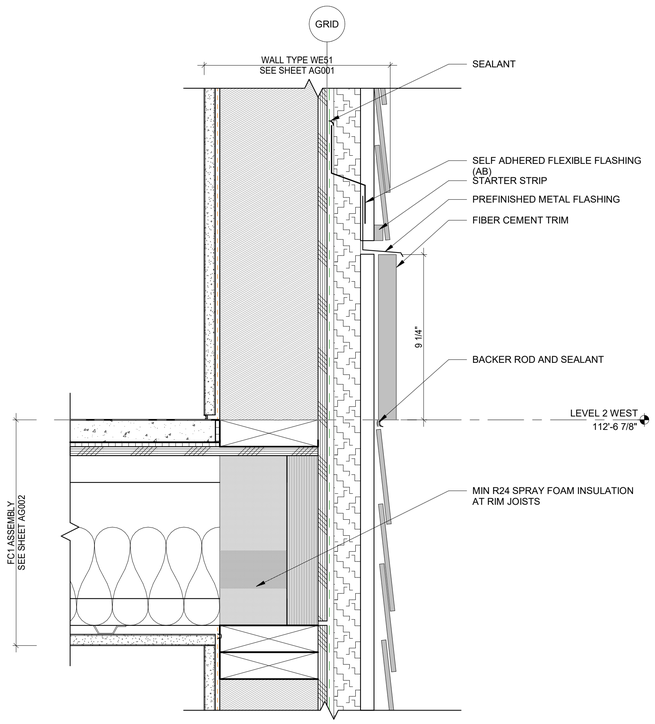
AG521

PLOT DATE: 3/28/2022 3:03:32 PM

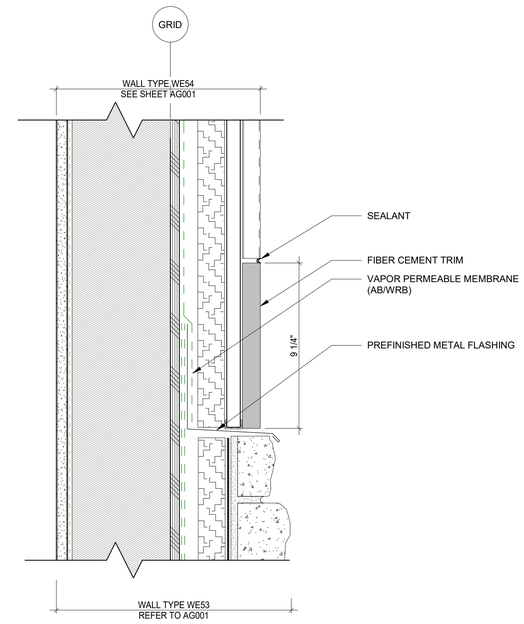
COPYRIGHT©



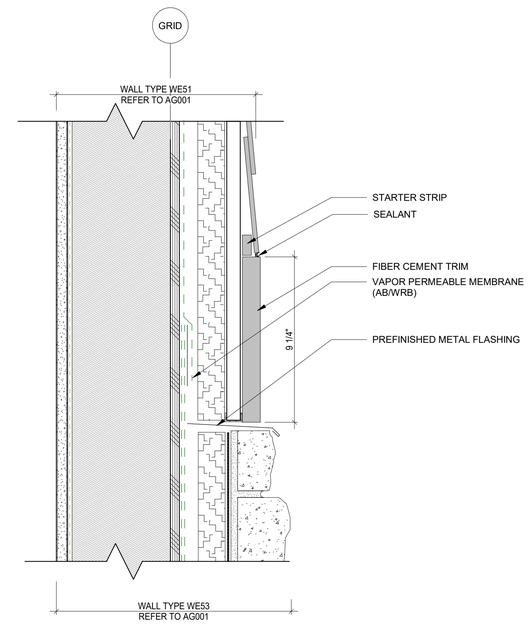
1/ TYPICAL FLOOR @ FIBER CEMENT BOARD & BATTEN
3" = 1'-0"



2/ TYPICAL FLOOR @ FIBER CEMENT LAP SIDING
3" = 1'-0"



3/ HORIZONTAL TRANSITION @ STONE VENEER & CORRUGATED METAL
3" = 1'-0"



4/ HORIZONTAL TRANSITION @ STONE VENEER & LAP SIDING
3" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

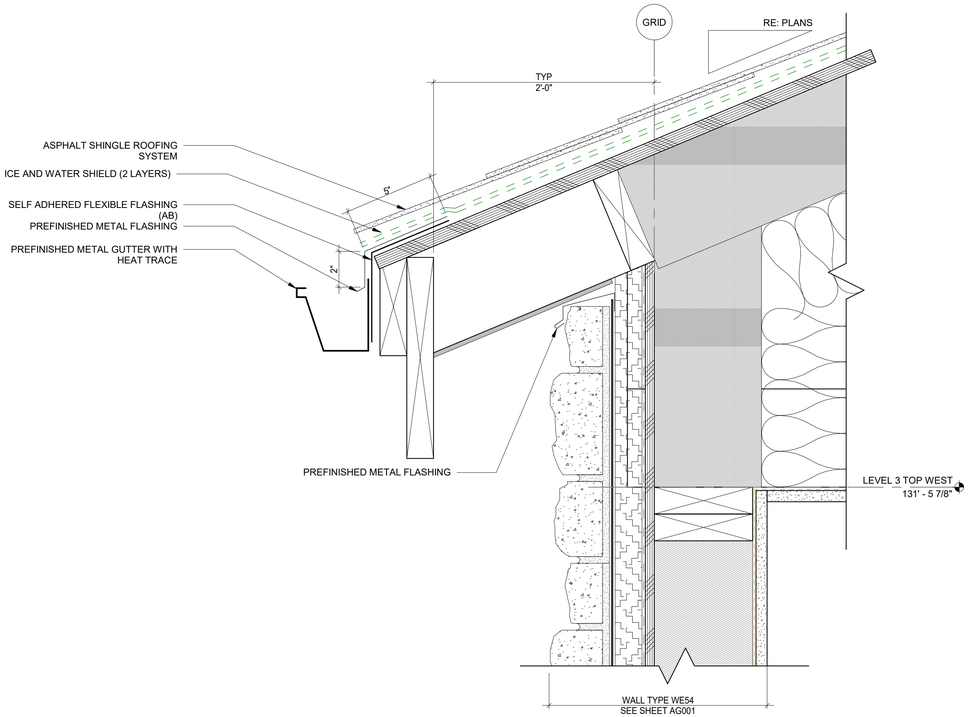
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

SECTION DETAILS

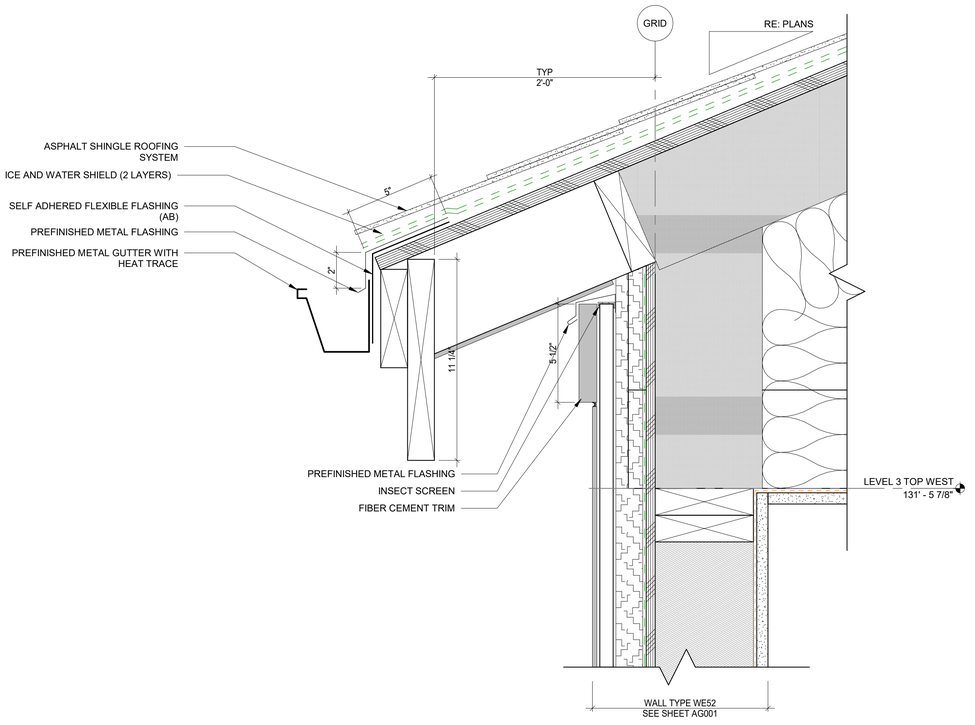
AG522

PLOT DATE: 3/28/2022 3:03:32 PM

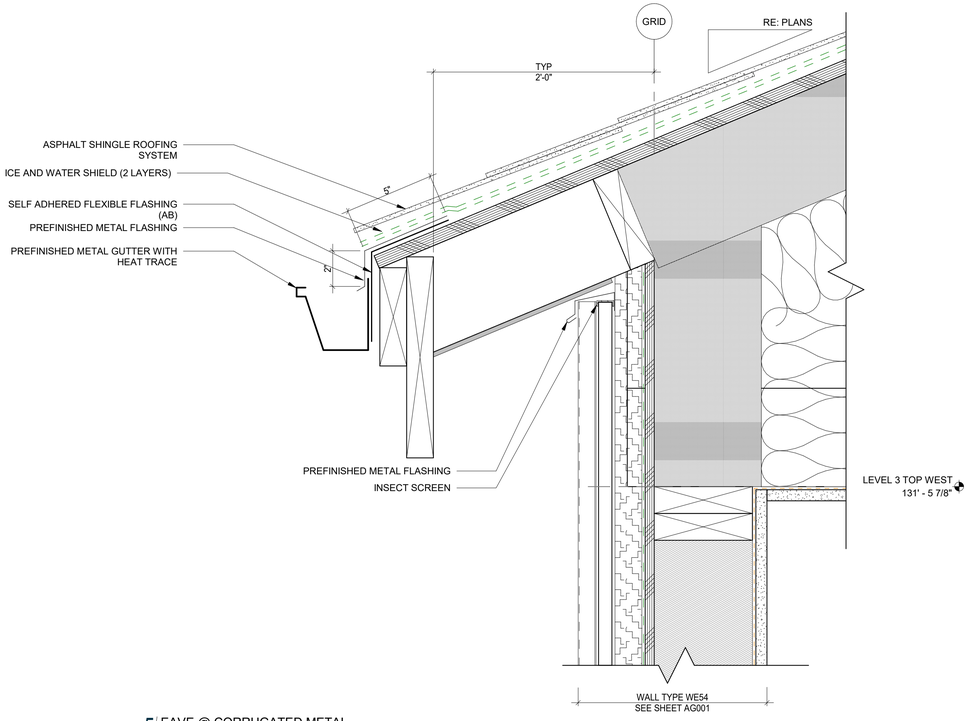
COPYRIGHT©



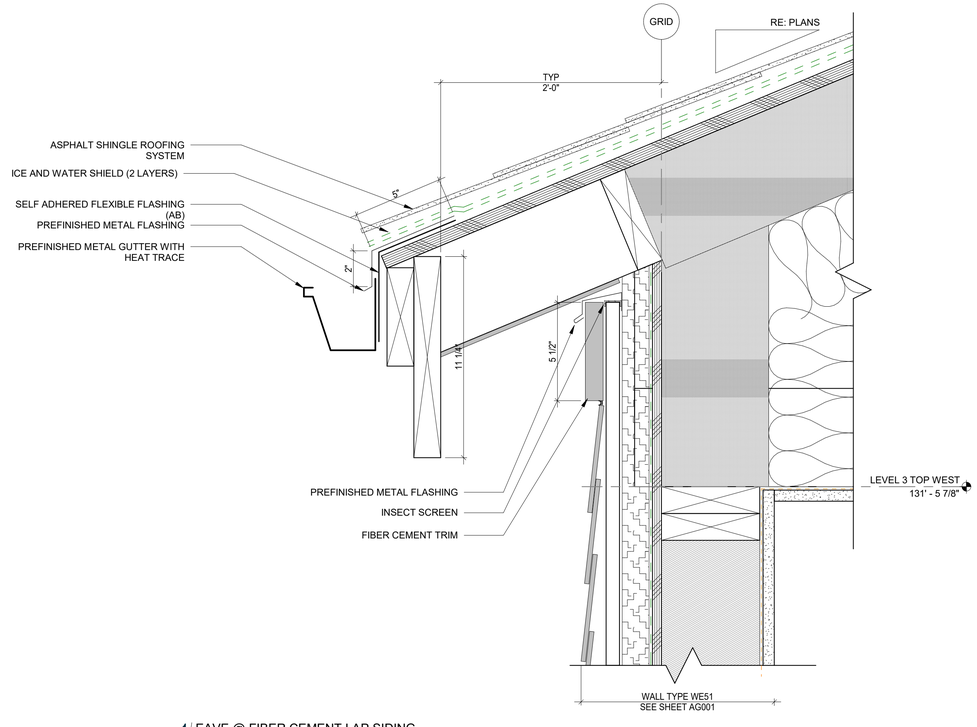
6 EAVE @ STONE VENEER
3" = 1'-0"



4 EAVE @ FIBER CEMENT SIDING
3" = 1'-0"



5 EAVE @ CORRUGATED METAL
3" = 1'-0"



1 EAVE @ FIBER CEMENT LAP SIDING
3" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

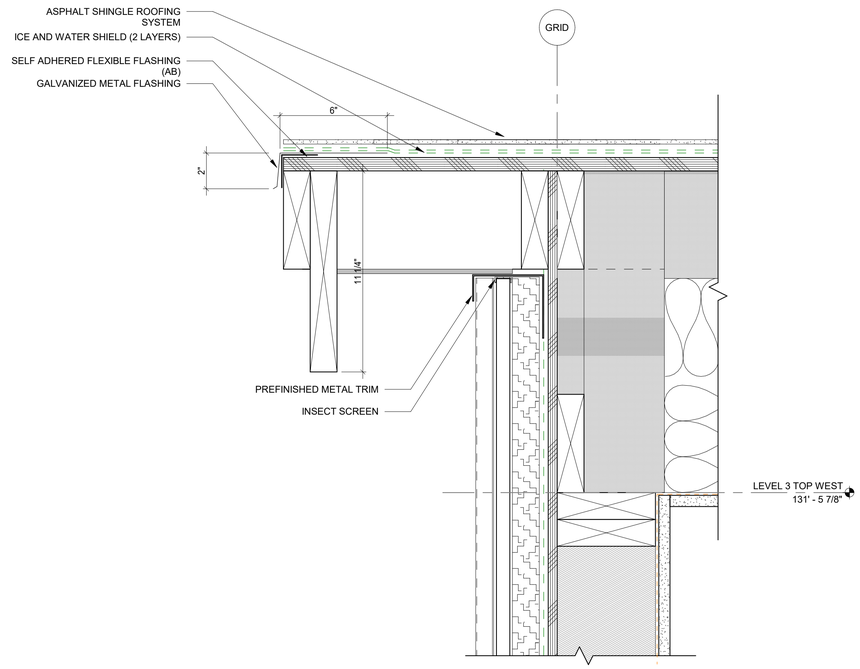
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

ROOF DETAILS @ EAVES

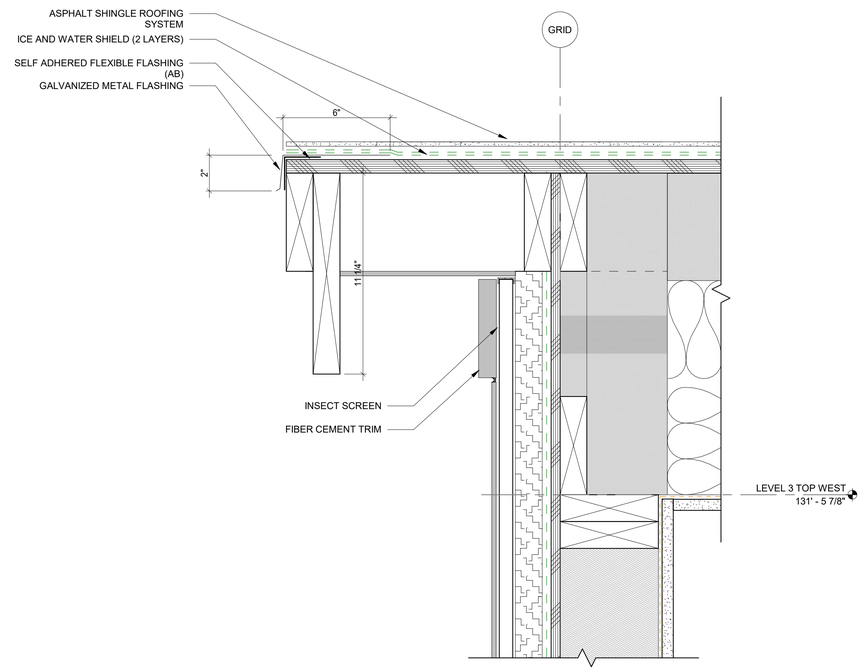
AG531

PLOT DATE: 3/28/2022 3:03:34 PM

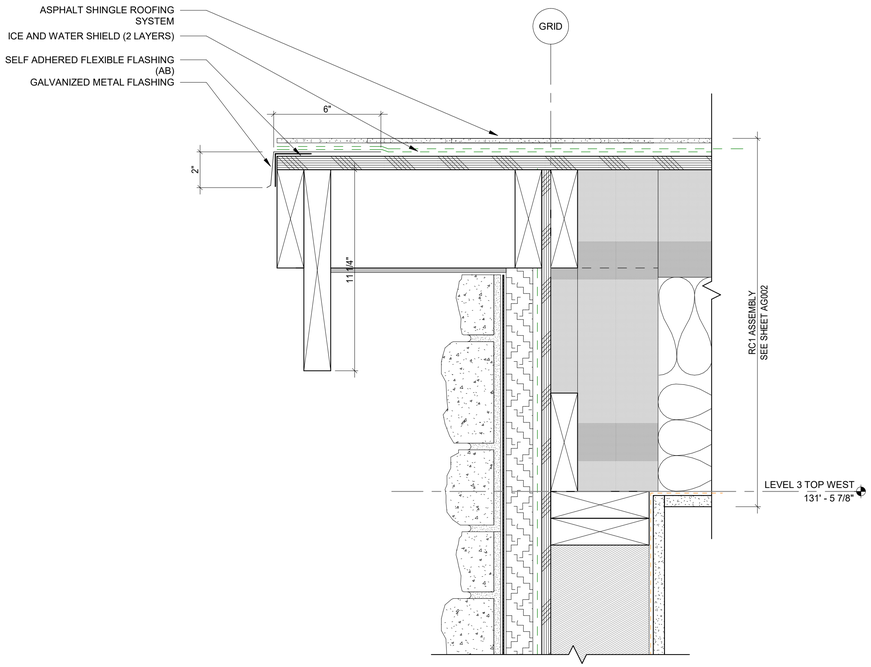
COPYRIGHT©



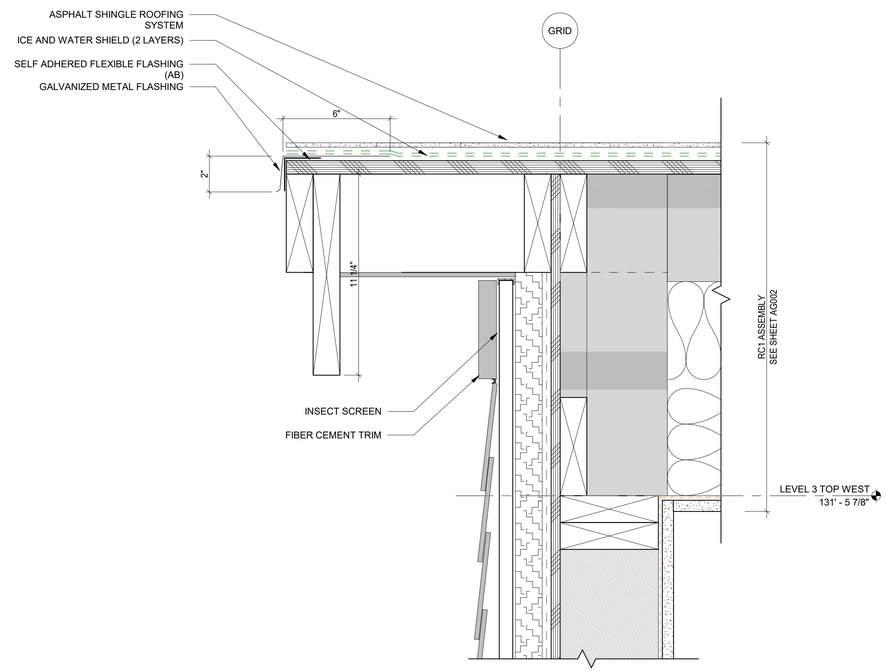
4 RAKE @ CORRUGATED METAL
3" = 1'-0"



2 RAKE @ FIBER CEMENT SIDING
3" = 1'-0"



3 RAKE @ STONE VENEER
3" = 1'-0"



1 RAKE @ FIBER CEMENT LAP SIDING
3" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

0" 1" THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

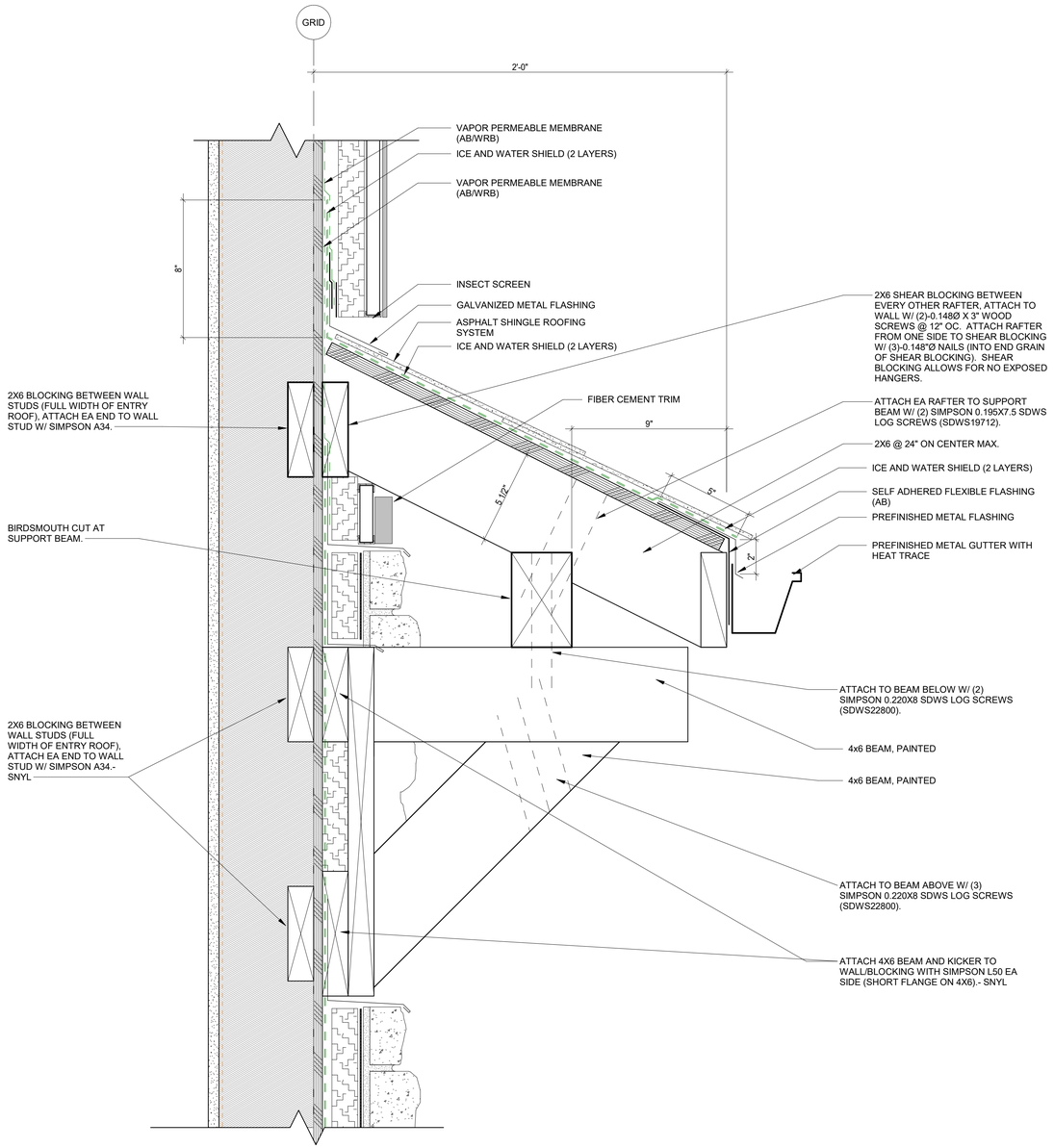
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

ROOF DETAILS @ RAKES

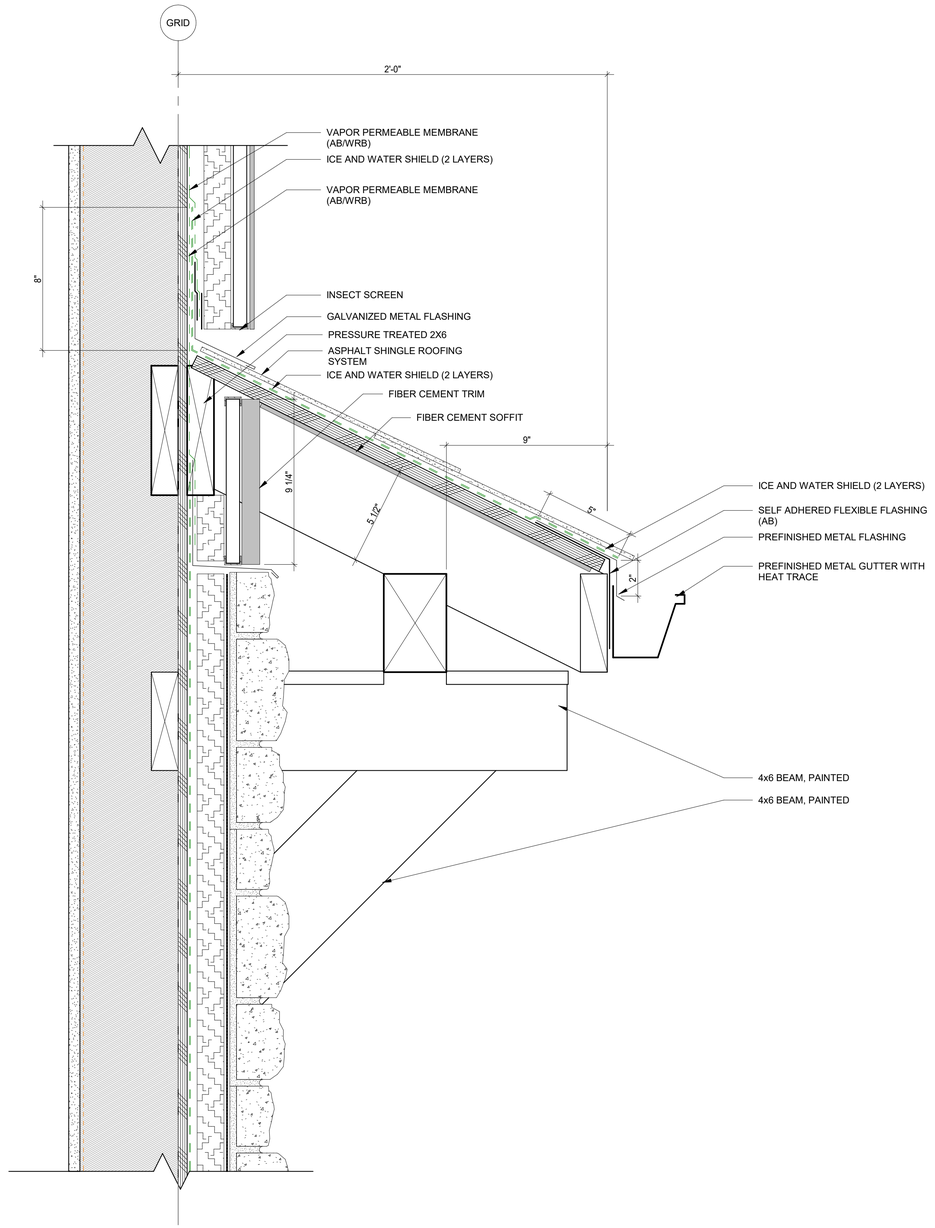
AG532

PLOT DATE: 3/28/2022 3:03:35 PM

COPYRIGHT©



2/ ENTRY ROOF @ STONE VENEER @ SUPPORT
3" = 1'-0"



1/ ENTRY ROOF @ STONE VENEER
3" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

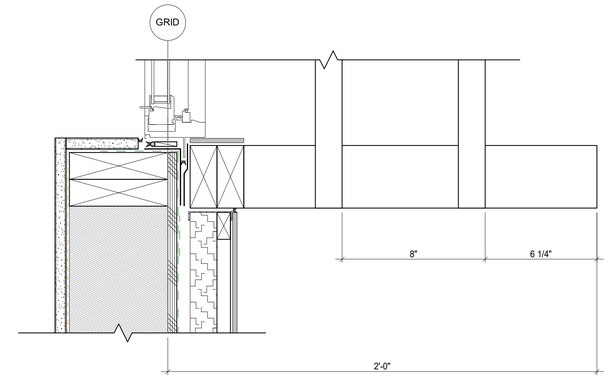
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

ROOF DETAILS

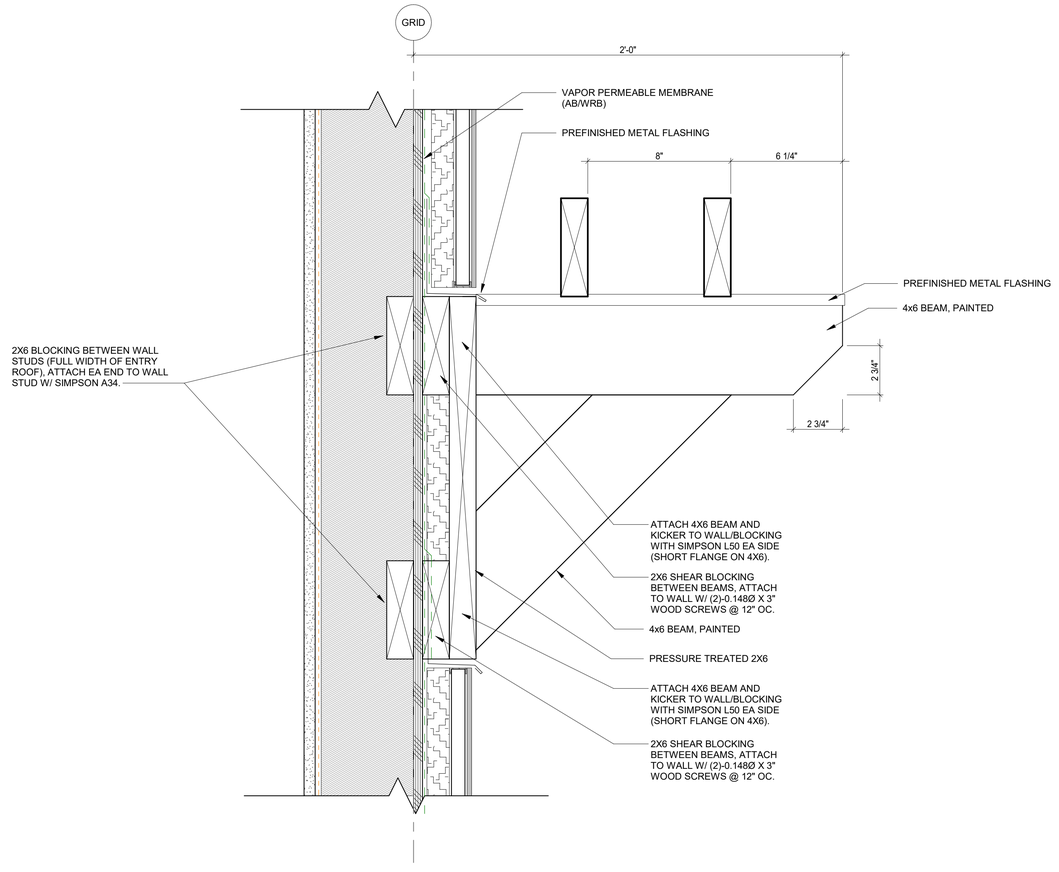
AG533

PLOT DATE: 3/28/2022 3:03:36 PM

COPYRIGHT©



2 SUNSHADE @ SUPPORT - PLAN DETAIL
3" = 1'-0"



1 SUNSHADE @ SUPPORT
3" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

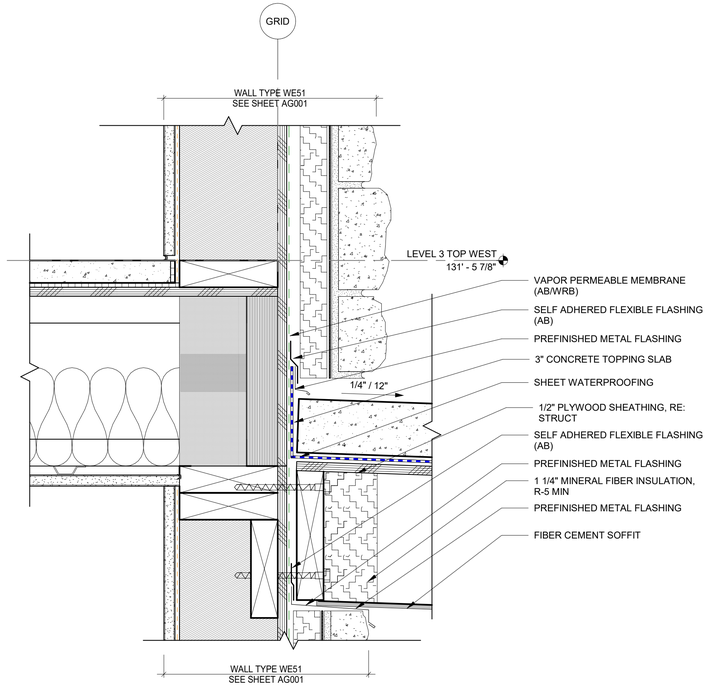
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

ROOF DETAILS

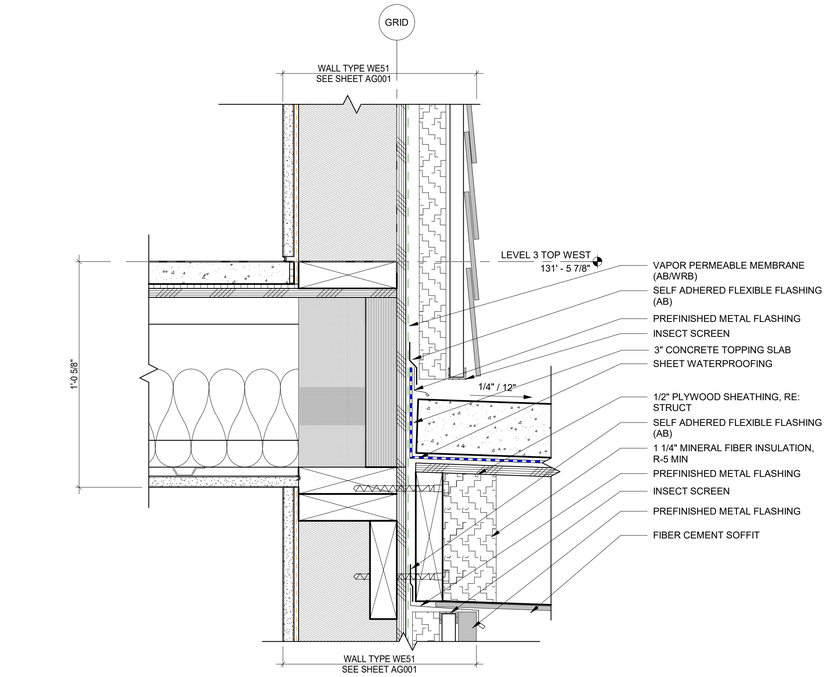
AG534

PLOT DATE: 3/28/2022 3:03:56 PM

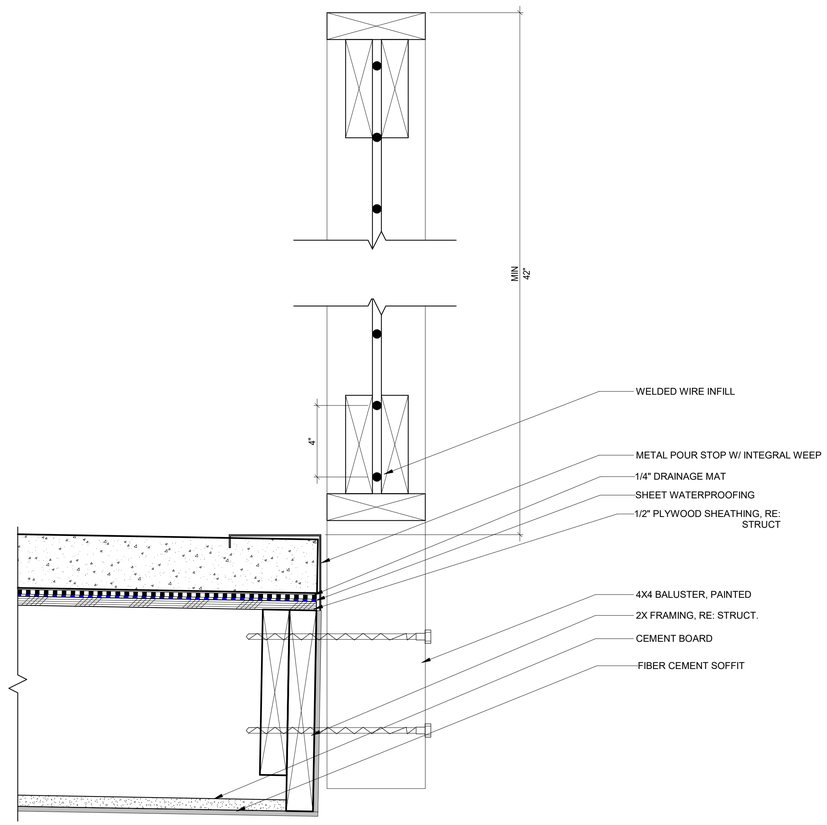
COPYRIGHT©



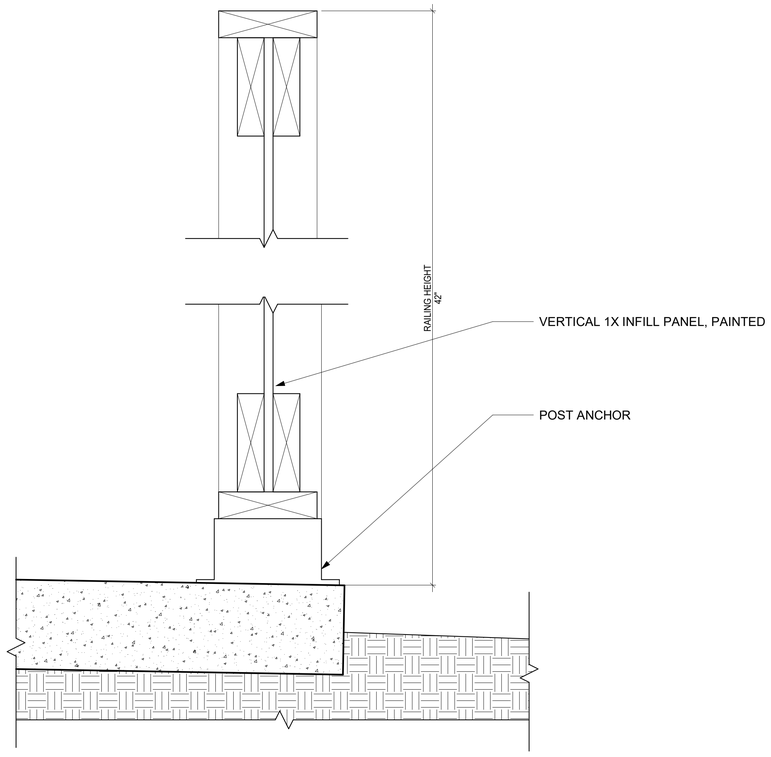
4 DECK @ STONE VENEER
3" = 1'-0"



2 DECK @ FIBER CEMENT LAP SIDING
3" = 1'-0"



3 BALCONY DETAIL @ CONCRETE EDGE
3" = 1'-0"



1 BALCONY DETAIL GROUND LEVEL @ SLAB EDGE
3" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

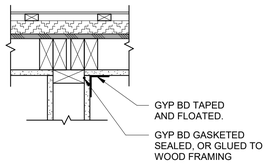
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

DECK & RAILING DETAILS

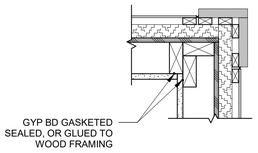
AG541

PLOT DATE: 3/28/2022 3:03:37 PM

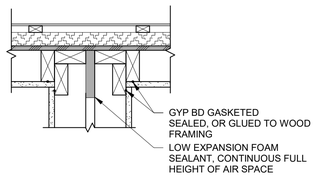
COPYRIGHT©



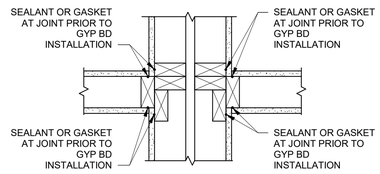
12 PLAN DETAIL - INTERIOR WALL @ EXTERIOR
1 1/2" = 1'-0"



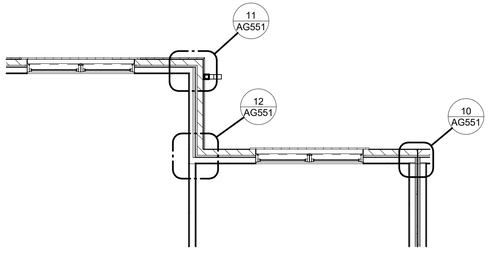
11 PLAN DETAIL - EXTERIOR WALL @ OUTSIDE CORNER
1 1/2" = 1'-0"



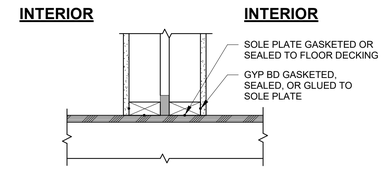
10 PLAN DETAIL - DEMISING WALL @ EXTERIOR
1 1/2" = 1'-0"



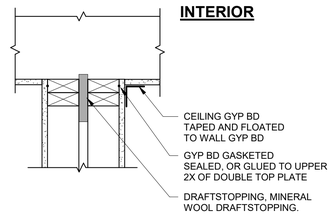
9 PLAN DETAIL - INTERIOR WALL @ DEMISING WALL
1 1/2" = 1'-0"



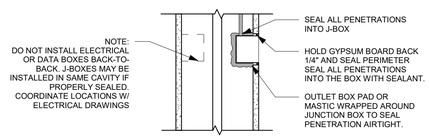
8 AIR SEALING KEY PLAN
1/4" = 1'-0"



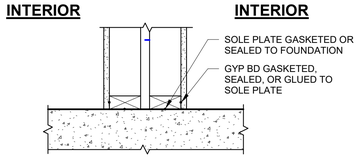
7 SECTION DETAIL - DEMISING WALL BASE
1 1/2" = 1'-0"



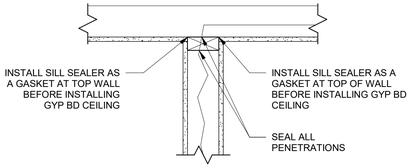
6 SECTION DETAIL - CEILING TO WALL
1 1/2" = 1'-0"



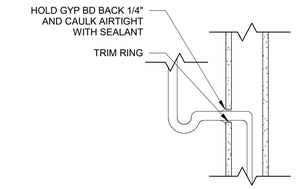
5 SECTION DETAIL - JUNCTION BOX INTERIOR
1 1/2" = 1'-0"



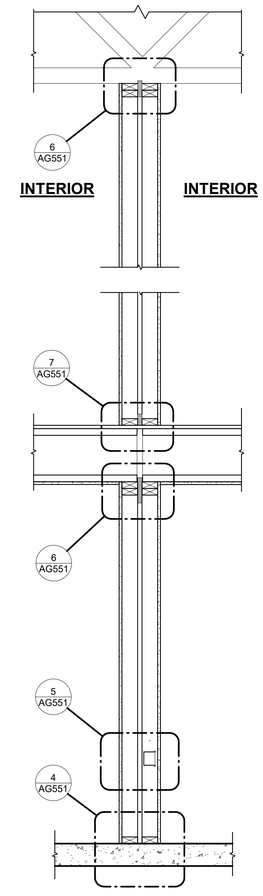
4 SECTION DETAIL - DEMISING @ SOLE PLATE
1 1/2" = 1'-0"



3 SECTION DETAIL - TYPICAL INTERIOR PARTITION
1 1/2" = 1'-0"



2 SECTION DETAIL - PLUMBING PENETRATION
1 1/2" = 1'-0"



1 INTERIOR WALL SECTION - AIR SEALING
3/4" = 1'-0"

AIR SEALING - GENERAL NOTES

1. THIS SHEET IS PROVIDED TO DEMONSTRATE AIRTIGHT SEALING OF EXTERIOR ENVELOPE AND DEMISING WALLS AND FLOORS USING THE AIRTIGHT DRYWALL APPROACH (ADA). CONSTRUCT THE BUILDING ENCLOSURE AND DEMISING WALLS AS A CONTINUOUS AIR BARRIER TO PREVENT AIR INFILTRATION AND EXFILTRATION THROUGH THE INTERIOR FACE OF EXTERIOR WALLS, UNIT DEMISING WALLS, FLOORS, AND CEILINGS.
2. DETAILS ON THIS SHEET DIAGRAM ONLY SHOW THE ADA BARRIER AND DO NOT INDICATE ALL REQUIRED BUILDING COMPONENTS (INCLUDING INSULATION, WATER-RESISTANCE BARRIER, AND FLASHING) THAT HAVE BEEN OMITTED FOR GRAPHIC CLARITY. EXTERIOR SIDING MATERIAL FOR REFERENCE ONLY, REFER TO PLANS FOR WALL TYPES.
3. DETAILS ON THIS SHEET ARE REPRESENTATIVE OF TYPICAL CONDITIONS. NOT ALL CONDITIONS ENCOUNTERED IN THE FIELD ARE DEPICTED ON THIS SHEET.
4. SUBCONTRACTORS MUST ATTEND PRECONSTRUCTION MEETINGS BETWEEN THE TRADES INVOLVED IN THE AIR BARRIER SYSTEM TO ENSURE THAT THERE ARE NO GAPS IN THE SCOPE OF WORK AND TO COORDINATE THE SEQUENCE AND METHODS OF INSTALLATION.
5. EACH SUBCONTRACTOR SHALL COORDINATE WITH OTHER TRADES TO ENSURE CONTINUITY OF THE AIR BARRIER SYSTEM, INCLUDING JOINTS, JUNCTURES AND TRANSITIONS BETWEEN MATERIALS AND ASSEMBLIES.
6. TESTS, INSPECTIONS AND RELATED ACTIONS WILL BE PERFORMED BY AN INDEPENDENT, THIRD-PARTY TESTING AGENCY. THE SPECIFIED INSPECTIONS, TESTS, AND RELATED ACTIONS DO NOT LIMIT THE CONTRACTOR'S QUALITY CONTROL PROCEDURES THAT FACILITATE COMPLIANCE WITH CONTRACT DOCUMENT REQUIREMENTS.
7. IT IS EACH SUBCONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THEIR RESPECTIVE PORTIONS OF THE COMPLETED AIR BARRIER SYSTEM ARE ADEQUATE TO MEET INSPECTION REQUIREMENTS, MINIMUM PERFORMANCE TESTING LEVELS, AND RELATED ACTIONS FOR THERS' CERTIFICATION.
8. ALL ITEMS FOUND TO BE DEFICIENT BY THE TESTING AGENCY, CONTRACTOR OR ARCHITECT SHALL BE BROUGHT INTO COMPLIANCE BY THE SUBCONTRACTOR WITHOUT ADDITIONAL COST TO THE OWNER,CONTRACTOR OR ARCHITECT.
9. DETAILS DO NOT INCLUDE ALL NOTES. REFER TO ALL DETAILS FOR COMPLETE INFORMATION FOR TYPICAL CONDITIONS.
10. AFTER SHEATHING IS INSTALLED INJECT FOAM SEALANT IN ALL JOINTS BETWEEN PRE-ASSEMBLED PANELS. CONTRACTOR MAY ELECT TO CAULK BOTH SIDES OFSTUDS 12. INJECT LOW EXPANSION FOAM AROUND ALL WINDOWS AND DOORS.COMPLETELY FILL VOID OF JAMB AND SPACE BETWEEN FRAMING MEMBERS AND HEADER.
11. SUPERINTENDENT TO INSPECT ALL WALL CAVITIES FOR AIR TIGHTNESS PER DETAILS, PRIOR TO CLOSING WITH GYP BD.
12. ALL CONTRACTORS TO PARTICIPATE IN AIR TIGHTNESS PRE-INSTALLATION MEETING TO REVIEW SEALANT AND GASKET INSTALLATION. TO INCLUDE: GENERAL CONTRACTOR, FRAMING CONTRACTOR, SEALANT CONTRACTOR, GYP. BOARD.INSTALLER, WINDOW AND DOOR INSTALLER.
13. RUBBERIZED SEALANT MAY BE USED IN LIEU OF SILL-SEAL GASKET AT ALL LOCATIONS.
14. INSTALL SILL-SEAL GASKET BETWEEN TOP PLATE AND GYP. BOARD AT ALL EXTERIOR AND DEMISING WALLS.
15. GYPCRETE TO FILL / SEAL BOTTOM OF GYP. BOARD TO FLOOR. OR INSTALL CONTINUOUS RUBBERIZED ASPHALTIC TAPE.

AIR BARRIER - INSTALLATION INSTRUCTIONS

1. CONSTRUCTION MANAGER TO APPROVE ADA BARRIER METHODS PRIOR TO INSTALLATION OF SOLE PLATES, EXTERIOR SHEATHING, AND GYP. BOARD.
2. INSTALL CONTINUOUS ADA BARRIER SYSTEM WITH ALL JOINTS AND PENETRATIONS SEALED AIRTIGHT.
3. INSTALL ADA BARRIER SYSTEM ON STRUCTURALLY SOUND SUBSTRATES TO WITHSTAND POSITIVE AND NEGATIVE AIR PRESSURES APPLIED TO THE BUILDING ENCLOSURE.
4. SEALS ARE TO BE CONTINUOUS FOR FULL LENGTH OR HEIGHT OF JOINT.

SEAL LOCATIONS:
1. INSTALL SEAL BETWEEN WALL GYP. BOARD AND CEILING GYP. BOARD AT UNINSULATED ATTICS (ALL WALLS).
2. INSTALL SEAL BETWEEN TOP PLATE AND GYP. BOARD (ALL WALLS).
3. INSTALL SEAL BETWEEN GYP. BOARD AND WINDOW HEAD, SILL, AND JAMB FRAMING.
4. INSTALL SEAL BETWEEN SOLE PLATE AND FOUNDATION OR FLOOR DECKING (EXTERIOR AND DEMISING WALLS).
5. INSTALL SEAL BETWEEN SOLE PLATE AND DRYWALL (EXTERIOR AND DEMISING WALLS).
6. SEAL ALL WALL PENETRATIONS AND FILL GAP BETWEEN DRYWALL, INCLUDING, BUT NOT LIMITED TO, JUNCTION BOXES, LIGHT FIXTURES, THERMOSTATS, DUCT WORK OR VENTS, PIPES, ETC. (EXTERIOR AND DEMISING WALLS, ALL CEILINGS AND FLOORS).
7. SEAL WIRE PENETRATIONS AND ALL OTHER OPENINGS IN JUNCTION BOXES TO PREVENT AIR LEAKING FROM BACK OF BOXES (EXTERIOR AND DEMISING WALLS).
8. SEAL FULL PERIMETER OF SHIM SPACE AT DOORS AND WINDOWS (EXTERIOR WALLS).
9. SEAL JOINT BETWEEN GYP. BOARD AND DOOR OR WINDOW FRAMES (ALL LOCATIONS).
10. INSTALL LOW-PRESSURE SPRAY FOAM OR CAULK BETWEEN SHOP-FABRICATED WALL PANELS WHERE GAPS ARE PRESENT.
11. SEAL BETWEEN GYP. BOARD AND VERTICAL STUD FRAMING AT CORNERS (EXTERIOR WALLS).
12. EXTEND GYPSUM BOARD TO FLOOR BEHIND TUBS AT UNIT PERIMETER WALLS.
13. ELECTRICAL PANELS LOCATED AT UNIT INTERIOR WALLS.

SEAL TYPES:
1. GYP. BOARD TO WALL FRAMING – GASKET, SEALANT, OR CONSTRUCTION ADHESIVE. SEAL TYPES #1 - BY INSULATION CONTRACTOR. NEEDS TO BE "DUPONT GREAT STUFF - DRYWALL GASKET" OR EQUAL.
2. SOLE PLATE TO CONCRETE FOUNDATION – SILL SEALER, GASKET, BUTYL MASTIC, OR SEALANT.
3. SOLE PLATE TO FLOOR DECKING - GASKET, SEALANT, OR CONSTRUCTION ADHESIVE.
4. GYP. BOARD TO GYP BOARD: TAPE AND FLOAT SEAMS.
5. SHIM SPACE AT WINDOWS AND DOORS – LOW-PRESSURE SPRAY FOAM.
6. WINDOW AND DOOR TRIM TO GYP. BOARD – PAINTABLE CAULK.
7. USE FIRE SEALANT AT RATED ASSEMBLIES.
8. FIRE-RATED SPRAY FOAM MAY BE USED AS SEALANT AND DRAFTSTOP AT RATED ASSEMBLIES.

"NOTES LISTED ABOVE APPLY TO ALL PROJECTS. THE FOLLOWING NOTES APPLY TO SPECIFIC PROJECTS WITH ENERGY REQUIREMENT OR HAVE A GREEN BUILDING CONSULTANT."

1. HOST PRE-CONSTRUCTION MEETING TO DISCUSS AND REVIEW DETAILS WITH EACH TRADE. COORDINATE MEETING WITH 3RD PARTY INSPECTION. THEY WILL HELP LEAD THE PRESENTATIONS AND SET THE CONSTRUCTION GOALS AND CRITERIA.
2. COMPLETE THE INSPECTION REPORT, FOUND IN SPECIFICATIONS APPENDICIES FOR EACH UNIT. EACH UNIT TO BE APPROVED PRIOR TO HANGING DRYWALL.
3. THESE DETAILS ARE DIAGRAMMATIC ONLY AND DO NOT INDICATE ALL REQUIRED BUILDING COMPONENTS. INSULATION, W.R.B., AND FLASHING HAVE BEEN OMITTED FOR CLARITY.
4. SHOWN DETAILS ARE OF TYPICAL REQUIREMENTS AT TYPICAL ASSEMBLIES AND DOES NOT NECESSARILY REPRESENT THE EXACT EXTERIOR DESIGN OF THIS PROJECT.

NOTE:
THE SUCCESS OF CONSTRUCTION WILL BE MEASURED BY THE ABILITY TO PASS BLOWER-DOOR TESTS AS DESIGNED. MANY ASPECTS OF THE PROJECT RELY ON THE SUCCESS OF THE DETAILS ON THE FOLLOWING PAGES: AIR TIGHTNESS AFFECTS: TENENANT COMFORT DUE TO THE MECHANICAL SYSTEM SIZING, ENERGY EFFICIENCY AS PART OF STATE AND LOCAL HOUSING AUTHORITY REQUIRMENTS, AND UNIT PERFORMANCE WHICH DICTATES COMPANY RENTAL RATE AND UTILITY ALLOWANCES.

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

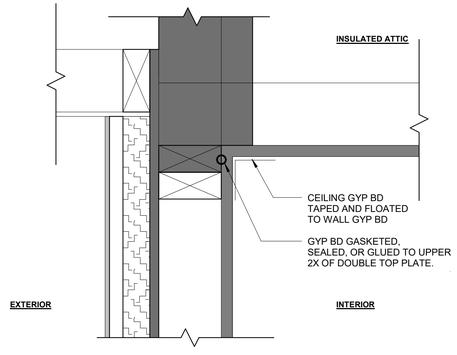
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

AIR SEALING DETAILS - INTERIOR

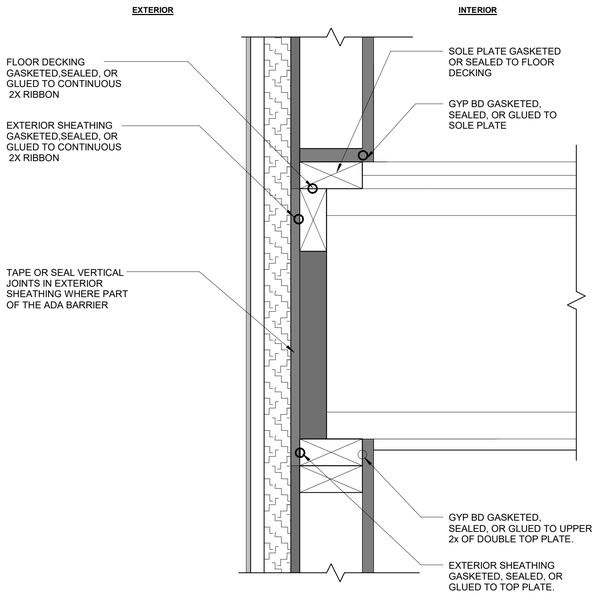
AG551

PLOT DATE: 3/28/2022 3:03:38 PM

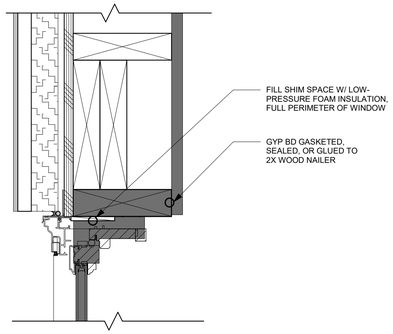
COPYRIGHT©



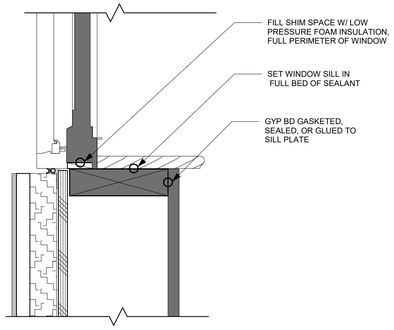
7 SECTION DETAIL - EXTERIOR WALL @ ROOF TRUSS
3" = 1'-0"



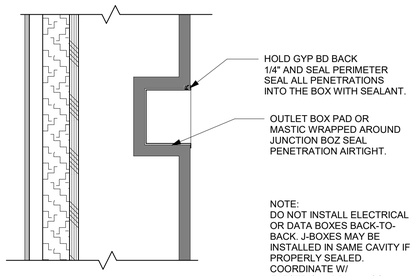
6 SECTION DETAIL - EXTERIOR WALL @ FLOOR JOIST
3" = 1'-0"



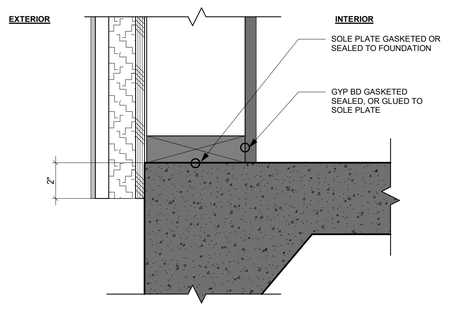
5 SECTION DETAIL - WINDOW HEAD
3" = 1'-0"



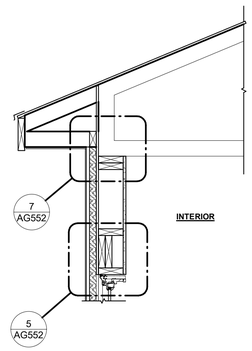
4 SECTION DETAIL - WINDOW SILL
3" = 1'-0"

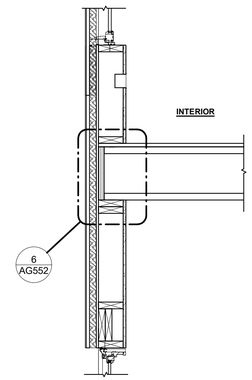


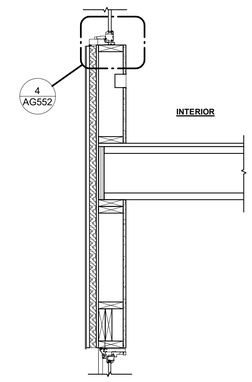
3 SECTION DETAIL - JUNCTION BOX EXTERIOR
3" = 1'-0"

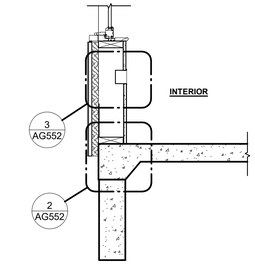


2 SECTION DETAIL - SOLE PLATE
3" = 1'-0"









1 EXTERIOR WALL SECTION - AIR SEALING
3/4" = 1'-0"

AIR SEALING - GENERAL NOTES

1. THIS SHEET IS PROVIDED TO DEMONSTRATE AIRTIGHT SEALING OF EXTERIOR ENVELOPE AND DEMISING WALLS AND FLOORS USING THE AIRTIGHT DRYWALL APPROACH (ADA). CONSTRUCT THE BUILDING ENCLOSURE AND DEMISING WALLS AS A CONTINUOUS AIR BARRIER TO PREVENT AIR INFILTRATION AND EXFILTRATION THROUGH THE INTERIOR FACE OF EXTERIOR WALLS, UNIT DEMISING WALLS, FLOORS, AND CEILINGS.
2. DETAILS ON THIS SHEET DIAGRAM ONLY SHOW THE ADA BARRIER AND DO NOT INDICATE ALL REQUIRED BUILDING COMPONENTS (INCLUDING INSULATION, WATER-RESISTANCE BARRIER, AND FLASHING) THAT HAVE BEEN OMITTED FOR GRAPHIC CLARITY. EXTERIOR SIDING MATERIAL FOR REFERENCE ONLY, REFER TO PLANS FOR WALL TYPES.
3. DETAILS ON THIS SHEET ARE REPRESENTATIVE OF TYPICAL CONDITIONS. NOT ALL CONDITIONS ENCOUNTERED IN THE FIELD ARE DEPICTED ON THIS SHEET.
4. SUBCONTRACTORS MUST ATTEND PRECONSTRUCTION MEETINGS BETWEEN THE TRADES INVOLVED IN THE AIR BARRIER SYSTEM TO ENSURE THAT THERE ARE NO GAPS IN THE SCOPE OF WORK AND TO COORDINATE THE SEQUENCE AND METHODS OF INSTALLATION.
5. EACH SUBCONTRACTOR SHALL COORDINATE WITH OTHER TRADES TO ENSURE CONTINUITY OF THE AIR BARRIER SYSTEM, INCLUDING JOINTS, JUNCTURES AND TRANSITIONS BETWEEN MATERIALS AND ASSEMBLIES.
6. TESTS, INSPECTIONS AND RELATED ACTIONS WILL BE PERFORMED BY AN INDEPENDENT, THIRD-PARTY TESTING AGENCY. THE SPECIFIED INSPECTIONS, TESTS, AND RELATED ACTIONS DO NOT LIMIT THE CONTRACTOR'S QUALITY CONTROL PROCEDURES THAT FACILITATE COMPLIANCE WITH CONTRACT DOCUMENT REQUIREMENTS.
7. IT IS EACH SUBCONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THEIR RESPECTIVE PORTIONS OF THE COMPLETED AIR BARRIER SYSTEM ARE ADEQUATE TO MEET INSPECTION REQUIREMENTS, MINIMUM PERFORMANCE TESTING LEVELS, AND RELATED ACTIONS FOR THERS' CERTIFICATION.
8. ALL ITEMS FOUND TO BE DEFICIENT BY THE TESTING AGENCY, CONTRACTOR OR ARCHITECT SHALL BE BROUGHT INTO COMPLIANCE BY THE SUBCONTRACTOR WITHOUT ADDITIONAL COST TO THE OWNER,CONTRACTOR OR ARCHITECT.
9. DETAILS DO NOT INCLUDE ALL NOTES. REFER TO ALL DETAILS FOR COMPLETE INFORMATION FOR TYPICAL CONDITIONS.
10. AFTER SHEATHING IS INSTALLED INJECT FOAM SEALANT IN ALL JOINTS BETWEEN PRE-ASSEMBLED PANELS. CONTRACTOR MAY ELECT TO CAULK BOTH SIDES OFSTUDS 12. INJECT LOW EXPANSION FOAM AROUND ALL WINDOWS AND DOORS.COMPLETELY FILL VOID OF JAMB AND SPACE BETWEEN FRAMING MEMBERS AND HEADER.
11. SUPERINTENDENT TO INSPECT ALL WALL CAVITIES FOR AIR TIGHTNESS PER DETAILS, PRIOR TO CLOSING WITH GYP BD.
12. ALL CONTRACTORS TO PARTICIPATE IN AIR TIGHTNESS PRE-INSTALLATION MEETING TO REVIEW SEALANT AND GASKET INSTALLATION TO INCLUDE: GENERAL CONTRACTOR, FRAMING CONTRACTOR, SEALANT CONTRACTOR, GYP. BOARD.INSTALLER, WINDOW AND DOOR INSTALLER.
13. RUBBERIZED SEALANT MAY BE USED IN LIEU OF SILL-SEAL GASKET AT ALL LOCATIONS.
14. INSTALL SILL-SEAL GASKET BETWEEN TOP PLATE AND GYP. BOARD AT ALL EXTERIOR AND DEMISING WALLS.
15. GYPCRETE TO FILL / SEAL BOTTOM OF GYP. BOARD TO FLOOR. OR INSTALL CONTINUOUS RUBBERIZED ASPHALTIC TAPE.

AIR BARRIER - INSTALLATION INSTRUCTIONS

1. CONSTRUCTION MANAGER TO APPROVE ADA BARRIER METHODS PRIOR TO INSTALLATION OF SOLE PLATES, EXTERIOR SHEATHING, AND GYP. BOARD.
2. INSTALL CONTINUOUS ADA BARRIER SYSTEM WITH ALL JOINTS AND PENETRATIONS SEALED AIRTIGHT.
3. INSTALL ADA BARRIER SYSTEM ON STRUCTURALLY SOUND SUBSTRATES TO WITHSTAND POSITIVE AND NEGATIVE AIR PRESSURES APPLIED TO THE BUILDING ENCLOSURE.
4. SEALS ARE TO BE CONTINUOUS FOR FULL LENGTH OR HEIGHT OF JOINT.

SEAL LOCATIONS:
1. INSTALL SEAL BETWEEN WALL GYP. BOARD AND CEILING GYP. BOARD AT UNINSULATED ATTICS (ALL WALLS).
2. INSTALL SEAL BETWEEN TOP PLATE AND GYP. BOARD (ALL WALLS).
3. INSTALL SEAL BETWEEN GYP. BOARD AND WINDOW HEAD, SILL, AND JAMB FRAMING.
4. INSTALL SEAL BETWEEN SOLE PLATE AND FOUNDATION OR FLOOR DECKING (EXTERIOR AND DEMISING WALLS).
5. INSTALL SEAL BETWEEN SOLE PLATE AND DRYWALL (EXTERIOR AND DEMISING WALLS).
6. SEAL ALL WALL PENETRATIONS AND FILL GAP BETWEEN DRYWALL, INCLUDING, BUT NOT LIMITED TO, JUNCTION BOXES, LIGHT FIXTURES, THERMOSTATS, DUCT WORK OR VENTS, PIPES, ETC. (EXTERIOR AND DEMISING WALLS, ALL CEILINGS AND FLOORS).
7. SEAL WIRE PENETRATIONS AND ALL OTHER OPENINGS IN JUNCTION BOXES TO PREVENT AIR LEAKING FROM BACK OF BOXES (EXTERIOR AND DEMISING WALLS).
8. SEAL FULL PERIMETER OF SHIM SPACE AT DOORS AND WINDOWS (EXTERIOR WALLS).
9. SEAL JOINT BETWEEN GYP. BOARD AND DOOR OR WINDOW FRAMES (ALL LOCATIONS).
10. INSTALL LOW-PRESSURE SPRAY FOAM OR CAULK BETWEEN SHOP-FABRICATED WALL PANELS WHERE GAPS ARE PRESENT.
11. SEAL BETWEEN GYP. BOARD AND VERTICAL STUD FRAMING AT CORNERS (EXTERIOR WALLS).
12. EXTEND GYPSUM BOARD TO FLOOR BEHIND TUBS AT UNIT PERIMETER WALLS.
13. ELECTRICAL PANELS LOCATED AT UNIT INTERIOR WALLS.

SEAL TYPES:
1. GYP. BOARD TO WALL FRAMING – GASKET, SEALANT, OR CONSTRUCTION ADHESIVE. SEAL TYPES #1 - BY INSULATION CONTRACTOR. NEEDS TO BE "DUPONT GREAT STUFF - DRYWALL GASKET" OR EQUAL.
2. SOLE PLATE TO CONCRETE FOUNDATION – SILL SEALER, GASKET, BUTYL MASTIC, OR SEALANT.
3. SOLE PLATE TO FLOOR DECKING - GASKET, SEALANT, OR CONSTRUCTION ADHESIVE.
4. GYP. BOARD TO GYP.BOARD: TAPE AND FLOAT SEAMS.
5. SHIM SPACE AT WINDOWS AND DOORS – LOW-PRESSURE SPRAY FOAM.
6. WINDOW AND DOOR TRIM TO GYP. BOARD – PAINTABLE CAULK.
7. USE FIRE SEALANT AT RATED ASSEMBLIES
8. FIRE-RATED SPRAY FOAM MAY BE USED AS SEALANT AND DRAFTSTOP AT RATED ASSEMBLIES.

"NOTES LISTED ABOVE APPLY TO ALL PROJECTS. THE FOLLOWING NOTES APPLY TO SPECIFIC PROJECTS WITH ENERGY REQUIREMENT OR HAVE A GREEN BUILDING CONSULTANT."

1. HOST PRE-CONSTRUCTION MEETING TO DISCUSS AND REVIEW DETAILS WITH EACH TRADE. COORDINATE MEETING WITH 3RD PARTY INSPECTION. THEY WILL HELP LEAD THE PRESENTATIONS AND SET THE CONSTRUCTION GOALS AND CRITERIA.
2. COMPLETE THE INSPECTION REPORT, FOUND IN SPECIFICATIONS APPENDICIES FOR EACH UNIT. EACH UNIT TO BE APPROVED PRIOR TO HANGING DRYWALL.
3. THESE DETAILS ARE DIAGRAMMATIC ONLY AND DO NOT INDICATE ALL REQUIRED BUILDING COMPONENTS. INSULATION, W.R.B., AND FLASHING HAVE BEEN OMITTED FOR CLARITY.
4. SHOWN DETAILS ARE OF TYPICAL REQUIREMENTS AT TYPICAL ASSEMBLIES AND DOES NOT NECESSARILY REPRESENT THE EXACT EXTERIOR DESIGN OF THIS PROJECT.

NOTE:
THE SUCCESS OF CONSTRUCTION WILL BE MEASURED BY THE ABILITY TO PASS BLOWER-DOOR TESTS AS DESIGNED. MANY ASPECTS OF THE PROJECT RELY ON THE SUCCESS OF THE DETAILS ON THE FOLLOWING PAGES. AIR TIGHTNESS AFFECTS: TENENANT COMFORT DUE TO THE MECHANICAL SYSTEM SIZING, ENERGY EFFICENCY AS PART OF STATE AND LOCAL HOUSING AUTHORITY REQUIRMENTS, AND UNIT PERFORMANCE WHICH DICTATES COMPANY RENTAL RATE AND UTILITY ALLOWANCES.

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

AIR SEALING DETAILS - EXTERIOR

AG552

PLOT DATE: 3/28/2022 3:03:39 PM

COPYRIGHT©

DOOR HARDWARE GROUPS

1. INTERIOR BIFOLD DOOR (LAUNDRY)
   - 1 DOOR TRACK
   - 1 PR GUIDES
   - 1 PR PULLS

2. INTERIOR STOREROOM (VTAC CLOSETS)
   - 1 ½ PR. HINGES
   - 1 EA. LEVER SET - STOREROOM FUNCTION

3. INTERIOR PRIVACY (BATHROOMS)
   - 1 ½ PR. HINGES
   - 1 EA. LEVER SET – PRIVACY FUNCTION

4. INTERIOR PASSAGE
   - 1 ½ PR. HINGES
   - 1 EA. LEVER SET – PASSAGE FUNCTION

5. UNIT ENTRY
   - 1 ½ PR. HINGES
   - 1 EA. LEVER SET – ENTRY FUNCTION W/KEYFOB READER
   - 1 EA. CLOSER
   - 1 SET SMOKE SEAL
   - 1 EA DEADBOLT
   - 1 EA DOORBELL
   - 1 SET WEATHER STRIPPING

6. INTERIOR BYPASS DOOR (BEDROOM CLOSETS)
   - 1 EA TRACK
   - 1 EA PULL

7. EXTERIOR STAIRWAY
   - 1 ½ PR. HINGES – NRP
   - 1 EA. LEVER SET - PASSAGE FUNCTION W/KEYFOB READER
   - 1 EA. STRIKE PROTECTOR
   - 1 EA. DRIP CAP
   - 1 EA. CLOSER
   - 1 EA. WEATHER STRIPPING

8. EXTERIOR STOREROOM (BIKE STORAGE & RISER ROOM)
   - 1 ½ PR. HINGES
   - 1 EA. LEVER SET - STOREROOM FUNCTION W/KEYFOB READER
   - 1 EA. CLOSER
   - 1 SET WEATHER STRIPPING

9. SLIDING PATIO DOOR
   - 1 EA HANDLE SET
   - 1 EA DOOR LOCK
   - 1 EA BAR LOCK

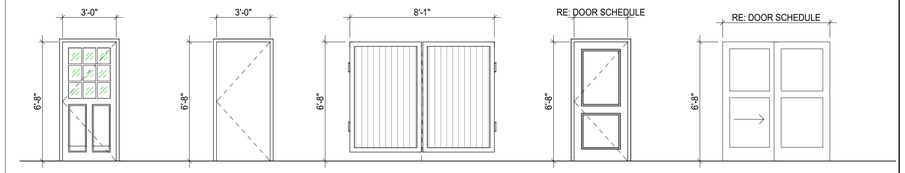
10. TRASH GATE
    - 1 EA HANDLE
    - 1 EA DROP ROD

DOOR SCHEDULE EXTERIOR

NUMBER	ELEVATION	FIRE RATING	WIDTH	HEIGHT	THICKNESS	FRAME FINISH	FRAME TYPE	PANEL FINISH	PANEL MATERIAL	DOOR HW GROUP
B101	B	20 MIN	3' - 0"	6' - 8"	0' - 1 3/4"	PAINT	HM	PAINT	HM	8
B102A	C	NR	8' - 1"	6' - 8"	0' - 3"	PAINT	STEEL	GLAZING	CORR METAL	10
B102B	B	20 MIN	3' - 0"	6' - 8"	0' - 1 3/4"	PAINT	HM	PAINT	HM	8
E105	A	NR	3' - 0"	6' - 8"	0' - 1 3/4"	PAINT	WOOD	PAINT	FIBERGLASS	7
E106	A	NR	3' - 0"	6' - 8"	0' - 1 3/4"	PAINT	WOOD	PAINT	FIBERGLASS	7
E107	B	NR	3' - 0"	7' - 0"	0' - 1 3/4"	PAINT	HM	PAINT	HM	8
W105	A	NR	3' - 0"	6' - 8"	0' - 1 3/4"	PAINT	WOOD	PAINT	FIBERGLASS	7
W106	A	NR	3' - 0"	6' - 8"	0' - 1 3/4"	PAINT	WOOD	PAINT	FIBERGLASS	7
W107	B	20 MIN	3' - 0"	6' - 8"	0' - 1 3/4"	PAINT	HM	PAINT	HM	8

DOOR SCHEDULE INTERIOR

NUMBER	ELEVATION	FIRE RATING	WIDTH	HEIGHT	THICKNESS	FRAME FINISH	FRAME TYPE	PANEL FINISH	PANEL MATERIAL	DOOR HARDWARE
U1	A	NR	3' - 0"	6' - 8"	0' - 1 3/4"	PAINT	WOOD	PAINT	FIBERGLASS	5
U2	J	20 MIN	3' - 0"	6' - 8"	0' - 1 3/4"	PAINT	WOOD	PAINT	HC WOOD	UNIT ENTRY DOORS FROM STAIRS
U3	D	NR	2' - 10"	6' - 8"	0' - 1 3/8"	PAINT	WOOD	PAINT	HC WOOD	2 (VTAC CLOSETS), 3 (BATHROOMS & BEDROOMS), 4 (ALL OTHERS)
U4	D	NR	2' - 8"	6' - 8"	0' - 1 3/8"	PAINT	WOOD	PAINT	HC WOOD	4
U5	D	NR	2' - 6"	6' - 8"	0' - 1 3/8"	PAINT	WOOD	PAINT	HC WOOD	4
U6	D	NR	2' - 4"	6' - 8"	0' - 1 3/8"	PAINT	WOOD	PAINT	HC WOOD	4
U7	E	NR	6' - 0"	6' - 8"	0' - 1 3/8"	PAINT	WOOD	PAINT	HC WOOD	6
U8	E	NR	5' - 0"	6' - 8"	0' - 1 3/8"	PAINT	WOOD	PAINT	HC WOOD	6
U9	F	NR	3' - 2"	6' - 10"	0' - 1 3/8"	PAINT	WOOD	PAINT	HC WOOD	BARN DOOR
U10	G	NR	5' - 0"	6' - 8"	0' - 1 3/8"	PAINT	WOOD	PAINT	HC WOOD	1
U11	H	NR	6' - 0"	6' - 8"	0' - 4"	BRONZE	VINYL	FULL GLASS	VINYL	9
U12	I	NR	3' - 0"	6' - 8"	0' - 1 3/4"	BRONZE	VINYL	FULL GLASS	VINYL	5



ELEVATION A
EXTERIOR ENTRY
INSULATED FIBERGLASS
PAINTED

ELEVATION B
EXTERIOR DOOR
HOLLOW METAL
PAINTED

ELEVATION C
TRASH ENCOSURE GATE
PAINTED METAL FRAME
CORRUGATED METAL PANEL

ELEVATION D
INTERIOR DOOR
HOLLOW CORE WOOD
PAINTED

ELEVATION E
INTERIOR DOOR
HOLLOW CORE WOOD
PAINTED

ELEVATION F
INTERIOR BARN DOOR

ELEVATION G
INTERIOR DOOR BIFOLD
HOLLOW CORE WOOD
PAINTED

ELEVATION H
EXTERIOR PATIO DOOR
FULL LITE VINYL
BRONZE COLOR

ELEVATION I
EXTERIOR PATIO DOOR
FULL LITE VINYL
BRONZE COLOR

ELEVATION J
INTERIOR DOOR
SOLID CORE WOOD
PAINTED

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

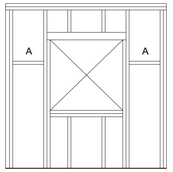
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

DOOR SCHEDULE

AG601

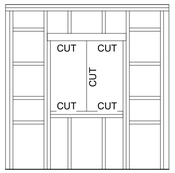
PLOT DATE: 3/28/2022 3:03:40 PM

COPYRIGHT©



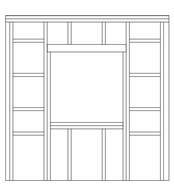
1. FRAMING

FRAMING-WHERE THE OPENING OCCURS IN A WALL WITHOUT EXTERIOR SHEATHING, BLOCKING MEMBERS (A) SHOULD BE INSTALLED AS NECESSARY TO SUPPORT THE OUTSIDE EDGES OF THE SIDE FLASH'G.



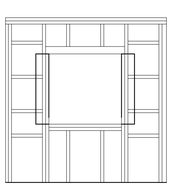
2. WRB OPENING

AT WALL OPENINGS, CUT THE WRB AS SHOWN: CUT 90 DEG. FROM BOTTOM MIDDLE, CUT FLUSH WITH THE TOP OF THE OPENING/UNDERSIDE OF HEADER, AND CUT VERICAL FROM THE BOTTOM MIDDLE CUT UP TO HEADER CUT.



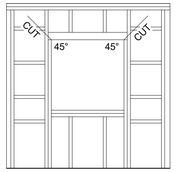
3. WATER RESISTANT BARRIER (WRB)

WATER RESISTANT BARRIER (WRB) INSTALLED PER MFR. REQUIREMENTS ON THE EXT. OF THE FRAMING/SHEATHING.



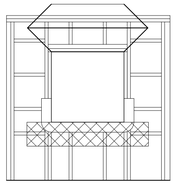
4. INSIDE FRAMING VIEW

FOLD THE SIDE FLAPS TO THE INSIDE OF THE OPENING AND STAPLE INTO PLACE.



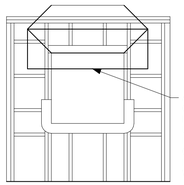
5. CUT WRB AT HEAD

AT THE WRB UPPER CORNERS, CUT 45 DEG. SLITS HIGH ENOUGH TO ACCOMODATE HEAD FLASHING.



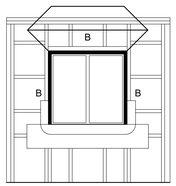
6. SILL FLASHING

INSTALL BOTTOM (SILL) FLASHING TIGHT TO THE BOTTOM OF THE OPENING. EXTEND GREATER THAN 12" PAST THE SIDES OF THE OPENING AND ATTACH TO THE NEXT AVAILABLE STUD. FASTEN ONLY THE TOP EDGE SO THAT SUBSEQUENT LAYERS OF WRB MAY BE LAPPED UNDER (SHINGLED).



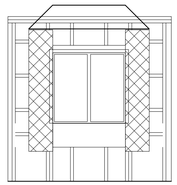
7. FLASH SILL & BOT. CORNERS

TEMPORARILY FOLD UP THE WRB FLAP ON THE EXT. FACE. INSTALL FLEXWRAP CONTINUOUS INTO THE FULL DEPTH OF THE OPENING ALONG SILL AND UP JAMBS 6" MIN.



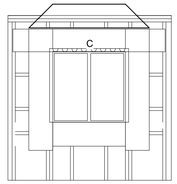
8. INSTALL WINDOW

INSTALL THE WINDOW BY FIRMLY PRESSING THE NAIL FLANGE ONTO A CONTINUOUS, FULL CONTACT BED OF SEALANT (B) EXTENDING AROUND TOP THREE SIDES OF THE WINDOW FLANGE, THE SEALANT BEAD (APPROX. 3/8" DIA.) SHOULD BE APPLIED TO THE BACK SIDE OF THE NAILING FLANGE PRIOR TO MOUNTING WINDOW UNIT. PLACE THE SEALANT IN LINE WITH PRE-PUNCHED HOLES AND SLOTS. THE WINDOW SHOULD THEN BE TRUED AND LEVELED. NAIL INTO PLACE PER MFR. INSTRUCTIONS.



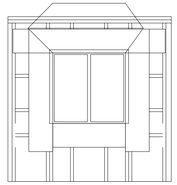
9. JAMB FLASHING

INSTALL SIDE (JAMB) FLASHING TIGHT TO THE SIDES OF THE OPENING. EXTEND FLASHING ABOVE THE TOP AND BELOW THE BOTTOM OF THE OPENING FOR A DISTANCE EQUAL TO AT LEAST THE WIDTH OF FLASHING. THE BOTTOMS OF THE SIDE FLASHING SHOULD LAP OVER THE BOTTOM FLASHING AND SHOULD NOT BE NAILED SO THAT SUBSEQUENT LAYERS OF WRB MAY BE LAPPED UNDER (SHINGLED).



10. HEAD FLASHING

INSTALL TOP (HEAD) FLASHING OVER THE TOP NAILING FLANGE. PRESS THE BOTTOM EDGE OF THE FLASHING STRIP INTO A CONTINUOUS, FULL CONTACT BED OF SEALANT (C) ON THE OUTSIDE FACE OF THE NAILING FLANGE. PLACE THE SEALANT IN LINE WITH PRE-PUNCHED HOLES AND SLOTS. EXTEND THE ENDS OF THE TOP FLASHING STRIP SO THAT IT AT LEAST OVERLAPS THE OUTER EDGES OF THE SIDE FLASHING STRIPS.



11. FOLD DOWN WRB

FOLD DOWN THE WRB HEAD FLAP DOWN OVER THE TOP FLASHING.

12. TAPE DIAG. CUTS

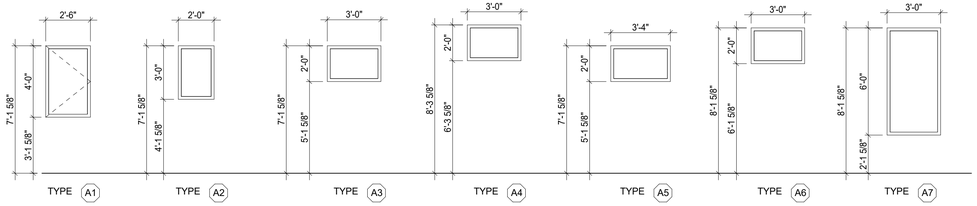
INSTALL COMPATIBLE WATERPROOF TAPE OVER THE FULL LENGTH OF THE 45 DEG. SLITS AT THE TOP CORNERS OF THE WINDOW (D).

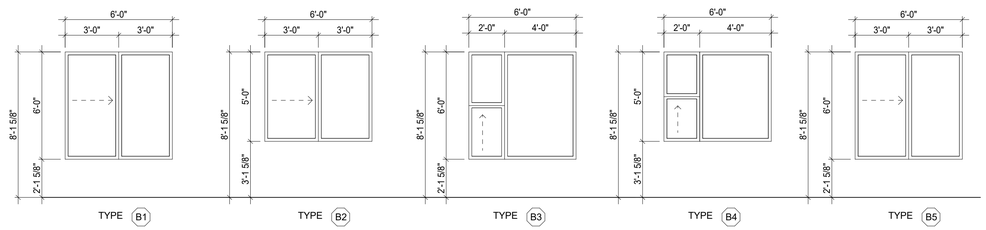
TYPICAL WINDOW FLASHING DETAILS

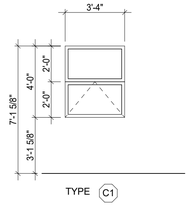
WINDOW SCHEDULE

WINDOW #	OPERATION	FRAME MATERIAL	HEAD HEIGHT	HEIGHT	WIDTH	COMMENTS
A1	CASEMENT	VINYL	7' - 1 5/8"	4' - 0"	2' - 6"	
A2	FIXED	VINYL	7' - 1 5/8"	3' - 0"	2' - 0"	
A3	FIXED	VINYL	7' - 1 5/8"	2' - 0"	3' - 0"	
A4	FIXED	VINYL	8' - 3 5/8"	2' - 0"	3' - 0"	
A5	FIXED	VINYL	7' - 1 5/8"	2' - 0"	3' - 4"	
A6	FIXED	VINYL	8' - 1 5/8"	3' - 0"	2' - 0"	
A7	FIXED	VINYL	8' - 1 5/8"	6' - 0"	3' - 0"	
B1	SLIDER	VINYL	8' - 1 5/8"	6' - 0"	6' - 0"	
B2	SLIDER	VINYL	8' - 1 5/8"	5' - 0"	6' - 0"	
B3	SINGLE HUNG	VINYL	8' - 1 5/8"	6' - 0"	6' -\0"	
B4	SINGLE HUNG	VINYL	8' - 1 5/8"	5' - 0"	6' -\0"	
B5	SLIDER	VINYL	7' - 1 5/8"	5' - 0"	6' - 0"	
C1	AWNING	VINYL	7' - 1 5/8"	4' - 0"	3' - 4"	

NOTE: ALL WINDOW FRAMES TO BE BRONZE COLORED







STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

WINDOW SCHEDULE

AG602

COPYRIGHT©

PLOT DATE: 3/28/2022 3:03:40 PM

EQUIPMENT SCHEDULE					
MARK	**DESCRIPTION**	**MANUFACTUERER**	**MODEL #**	**FINISH**	**NOTES**
RF-1	REFRIDGERATOR/FREEZER	WHIRLPOOL	WRT549SZD	STAINLESS STEEL	29-3/4" X 34-1/2" X 65-7/8"
MW-1	MICROWAVE	FRIGIDAIRE	FFMV1845VS	STAINLESS STEEL	1.8 CU FT, EXHAUST MAX 300 CFM, 1000W
ER-1	ELECTRIC RANGE	FRIGIDAIRE	WEE510SAGS		30" 5.0 CU FT SINGLE
DW-1	DISHWASHER	WHIRLPOOL		STAINLESS STEEL	24" Monochromatic Front Control, 55 Dba
WD-1 or WD-2	STACKABLE OR SIDE BY SIDE WASHER/DRYER	AMANA	WASHER: NFW5800HW, DRYER: NED5800HW, STACKABLE: W10869845	WHITE	4.3 CU FT HIGH EFFIENCY, ENERGY STAR, FRONT LOADING WASHER/DRYER WD-1 IS STACKABLE AND WD-2 IS THE SIDE BY SIDE MODEL

UNIT FINISH SCHEDULE						
MARK	**DESCRIPTION**	**MANUFACTURER**	**PRODUCT/PATTERN**	**COLOR**	**PRODUCT #**	**NOTES**
P-1	INTERIOR WALL PAINT	Sherwin Williams	Interior Latex Eggshell	Pure White	SW7005	ORANGE PEEL FINISH
P-2	INTERIOR WALL PAINT (Restrooms)	Sherwin Williams	Interior Latex Semi-Gloss	Pure White	SW7005	ORANGE PEEL FINISH
P-3 (a)	ACCENT WALL	Sherwin Williams	Interior Latex Semi-Gloss	Henna Shade	SW6326	ORANGE PEEL FINISH, Option for P-3
P-3 (b)	ACCENT WALL	Sherwin Williams	Interior Latex Semi-Gloss	Repose Gray	SW7015	ORANGE PEEL FINISH, Option for P-3
P-4	4" WALL BASE AND TRIM	TBD	4 1/4" x 1/2" Straight Profile Primed	High Reflective White	SW7757	MDF
P-5	CEILING PAINT	Sherwin Williams	Interior Latex Flat	High Reflective White	SW7757	ORANGE PEEL FINISH
LVP-1	FLOORING (ALL ROOMS EXCEPT BEDROOMS)	Shaw Contract	Terrain II 12 Mil	Root	0454V/00568	Install Staggered
CPT-1	BEDROOM CARPET	Shaw Contract	Scenery Broadloom	Picturesque	5A255/00175	
T-1	KITCHEN BACKSPLASH TILE	Crossville Studios	Warehouse Row	Verde Acqua	FR04	Install Ashlar
CTP-1	COUNTERTOPS	Corian	Dune	Prima	N/A	3 CENTIMETER SOLID SURFACE IN BUDGET
CAB-1	UNIT CABINETS	Leedo	Shaker Paint Grade	Chelsea Gray	N/A	
HDW-1	UNIT CABINET HARDWARE	Hickory Hardware	Bedrock	Dark Antique Copper	P3565-DAC	SOLID WOOD FACE WITH PLYWOOD BOX
KS-1	KITCHEN SINK	Moen	Drop In Double Bowl 20 Gauge	Stainless	GS202131Q	
KF-1	KITCHEN FAUCET	Moen	Brecklyn	Mediterranean Bronze	87557BRB	
BS-1	BATHROOM SINK	Gerber	Luxoval	White	G0012844	
BF-1	BATHROOM FAUCET	Moen	Eva	Oil Rubbed Bronze	6410ORB	
TSF-1	TUB/SHOWER FAUCET	Moen	Eva and Rough-In Valve	Oil Rubbed Bronze	T2133EPORB + 2510	

TARGETING LEED APPROVED PRODUCTS (LOW EMITTING, RECYCLED CONTENT, ETC.)

STAIR FINISH SCHEDULE						
MARK	**DESCRIPTION**	**MANUFACTURER**	**PRODUCT/PATTERN**	**COLOR**	**PRODUCT #**	**NOTES**
P-1	STAIR - WALL PAINT	Sherwin Williams	Interior Latex Eggshell	Pure White	SW7005	ORANGE PEEL FINISH
P-6	STAIR - ACCENT WALL PAINT	Sherwin Williams	Interior Latex Eggshell	Mindful Gray	SW7016	
RB-1	STAIR - RUBBER TREAD	Roppe	Renew Stair Tread	Cadet	R638	
RB-2	STAIR - RUBER BASE	Roppe	Pinnacle Rubber 4" w/ Toe	Smoke	174	
P-7	STAIR - HANDRAIL PAINT	Sherwin Williams	Waterbased Alkyd Urethane	Sealskin	SW7675	

TARGETING LEED APPROVED PRODUCTS (LOW EMITTING, RECYCLED CONTENT, ETC.)

BIKE PARKING FINISH SCHEDULE						
MARK	**DESCRIPTION**	**MANUFACTURER**	**PRODUCT/PATTERN**	**COLOR**	**PRODUCT #**	**NOTES**
P-8	WALL PAINT FOR BIKE PARKING ROOM	Sherwin Williams	Interior Latex Semi-Gloss	Olympus White	SW6253	ORANGE PEEL FINISH
RB-3	RUBBER BASE	Roppe	Pinnacle Rubber 4" w/ Toe	Smoke	174	

TARGETING LEED APPROVED PRODUCTS (LOW EMITTING, RECYCLED CONTENT, ETC.)

GENERAL MILLWORK NOTES:

1. ALL WOODWORK/MILLWORK SHALL CONFORM TO THE QUALITY STANDARDS OF ARCHITECTURAL WOODWORK INSTITUE (AWI) PREMIUM GRADE. FABRICATOR SHALL BE FAMILIAR WITH AWI STANDARDS.

2. FABRICATE WOODWORK/MILLWORK ITEMS TO ACTUAL FIELD DIMENSIONS. CONTRACTOR(S) SHALL SUBMIT, FOR OWNER'S/DESIGNER'S APPROVAL, SHOP DRAWINGS, DAMPLES, OR MAUFACTUERER'S LITERATURE FOR ALL ITEMS. SHOP DRAWINGS SHALL SHOW SUFFICIENT DETAIL TO DETERMINE COMPLIANCE WITH QUALITY STANDARDS AND DESIGN INTENT.

3. PROVIDE ALL NECESSARY FURRING AND GROUNDS FOR WOODWORK AND FINISH ITEMS AS OUTLINED IN TWG STANDARDS. COORDINATE LOCATION OF BLOCKING WITHIN PARTITIONS FOR ITEMS TO BE SECURED TO SURFACE. ALL FASTENERS SHALL BE CONCEALED.

4. PROVIDE PULLS AT ALL CABINETS. SUBMIT MANUFACTURER'S STANDARD OPTIONS FOR OWNER'S/DESIGNER'S APPROVAL.

PLOT DATE: 3/28/2022 3:03:41 PM

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

FINISH SCHEDULE

AG603

COPYRIGHT©

ELECTRIC WATER HEATER SCHEDULE

TAG	MANUFACTURER	MODEL	LOCATION	TYPE	STORAGE CAPACITY (GAL)	DOMESTIC WATER CHARACTERISTICS			UNIT TOTAL ELECTRICAL SERVICE	DIMENSIONS		UNIT ELECTRICAL SERVICE				OPERATIONAL WEIGHT (LBS)	SPECIFIC NOTES
						RECOVERY @ 100°F RISE (GPH)	EWT (°F)	LWT (°F)	KW	DIAMETER (IN.)	HEIGHT (IN.)	VOLTS/PH/HZ	FLA	MCA	MOCP		
HEWH-1	AO SMITH	HPTU-50N	UNITS	HYBRID ELECTRIC WATER HEATER	46	19	40	140	4.5	22"	63"	208/1/60	21.63	28	30	650	

GENERAL NOTES
1. UNIT TO HAVE FULL-SIZE HOT AND COLD WATER DIELECTRIC UNIONS AND INTEGRAL HEAT TRAPS.
2. PROVIDE 3-YEAR WARRANTY.
3. PROVIDE 2.4 GALLON EXPANSION TANK (THERM-X-TROL ST-5 MODEL OR EQUAL).

PLUMBING EQUIPMENT SCHEDULE

TAG	MANUFACTURER	MODEL	DESCRIPTION	EQUIPMENT CONNECTION SIZES				SPECIFIC NOTES
				W	V	CW	HW	
BFP-1	WATTS	LF909	LEAD FREE REDUCED PRESSURE ZONE BACKFLOW PREVENTER ASSEMBLY. PROVIDE WITH SHUT-OFF VALVES, FULL SIZE STRAINER, RELIEF AIR-GAP DRAIN AND FULL SIZE FUNNEL, PIPE DISCHARGE TO NEAREST FLOOR SINK.	-	-	2"	-	
CWB-1	SIOUX CHIEF	696G231	WASHING MACHINE VALVE OR EQUIVALENT OF GUY GRAY WITH RECESSED SUPPLY AND 2" DRAIN. PROVIDE A 2" TRAPPED STANDPIPE IN CONCEALED WALL SPACE.	3"	2"	1/2"	1/2"	RECESSED IN WALL
DWB-1	SIOUX CHIEF	696G1011MR	BOTTOM SUPPLY, OUTLET CONNECTION BOX. PROVIDE 1/4 TURN HOT WATER VALVES AND INTEGRAL SHOCK ABSORBER.	-	-	-	1/2"	
FBFP-1	WATTS	774DCDA-OSY	DOUBLE CHECK BACKFLOW PREVENTER ASSEMBLY. PROVIDE WITH SHUT-OFF VALVES.	-	-	4"	-	
FD-1	JAY R. SMITH	2005Y-NB-A	TWO-PIECE, COATED CAST IRON BODY WITH DOUBLE DRAINAGE FLANGE, NON-PUNCTURING INVERTIBLE FLASHING COLLAR, WEEPHOLES, BOTTOM OUTLET AND ADJUSTABLE NICKEL BRONZE ROUND STRAINER GRATE. PROVIDE PROSET TRAP GUARD.	3"	-	-	-	
FS-1	JAY R. SMITH	3200Y-PDBS-12	16" SQUARE, CAST IRON, 12" DEEP FLOOR SINK WITH ACID-RESISTING INTERIOR, DOUBLE DRAINAGE FLANGE WITH WEEPHOLES, BOTTOM OUTLET, ALUMINUM INTERNAL DOME STRAINER, NICKEL LIGHT DUTY, ANTI-TILTING HALF GRATE. PROVIDE WITH TRAP PRIMER.	4"	-	-	-	
MV-1	WATTS	LFMMV	UNDER-SINK THERMOSTATIC TEMPERING VALVE. PROVIDE ANGLE STOPS. PROVIDE VALVE AT EACH FIXTURE. SET DISCHARGE TEMPERATURE FOR 100°F.					
SV-1	STUDOR INC.	MINI-VENT	AIR ADMITTANCE VALVE, ASSE 1050 RATED. PROVIDE WITH IN-WALL ACCESS BOX AND GRILLE.	-	1-1/2"	-	-	
WH-1	WOODFORD	B67	HOSE-END, BACKFLOW-PROTECTED, AUTOMATIC-DRAINING, FREEZELESS TYPE WITH FLUSH MOUNTED, CHROME PLATED, LOCKABLE, WALL BOX.	-	-	3/4"	-	

PLUMBING FIXTURE SCHEDULE

ALL PLUMBING FIXTURE SELECTIONS, REGARDLESS OF THIS SCHEDULE SHALL BE SUBMITTED FOR THE BUILDING OWNER'S AND ARCHITECT'S PRE-APPROVAL PRIOR TO CONTRACTOR'S PURCHASE ORDER OF ALL PLUMBING FIXTURES.

TAG	MANUFACTURER	MODEL	DESCRIPTION	FIXTURE CONNECTION SIZES				SPECIFIC NOTES
				W	V	CW	HW	
BT-1	MOEN	T2133EPORB+2510	AQUATIC MODEL F6032STT18M TUB/SHOWER SYSTEM, MIXING VALVE WITH ADJUSTABLE STOP SCREW TO LIMIT HANDLE TURN. PROVIDE MANUFACTURER'S FLOW RATE RESTRICTOR ON SHOWERHEAD. 1.75 GPM	2"	1 1/2"	1/2"	1/2"	
BT-1A	MOEN	3853BRB,T2131+2510,3669EPORB	AQUATIC MODEL F6032STT18M ADA COMPLIANT TUB/SHOWER SYSTEM MIXING VALVE WITH ADJUSTABLE STOP SCREW TO LIMIT HANDLE TURN. PROVIDE MANUFACTURER'S FLOW RATE RESTRICTOR ON SHOWERHEAD. 1.75 GPM	2"	1 1/2"	1/2"	1/2"	
LAV-1 (SINK/FAUCET)	GERBER/MOEN	G0012844/6410ORB	COUNTERTOP LAVATORY, SELF-RIMMING, FAUCET HOLES ON 4" CENTERS. DECK-MOUNTED FAUCET, GRID DRAIN, LOOSE KEY ANGLE STOPS AND SUPPLIES. INSULATE WATER AND WASTE WITH INSULATION KIT. 0.5 GPM	2"	1 1/2"	1/2"	1/2"	
LAV-1A (SINK/FAUCET)	GERBER/MOEN	G0012844/6410ORB	COUNTERTOP SELF-RIMMING, FAUCET HOLES ON 4" CENTERS. DECK-MOUNTED FAUCET EXTERNAL THERMOSTATIC MIXING VALVE MV-1, GRID DRAIN, LOOSE KEY ANGLE STOPS AND SUPPLIES INSULATE WATER AND WASTE TO MEET ADA REQUIREMENTS USING ADA INSULATION KIT. 0.5 GPM	2"	1 1/2"	1/2"	1/2"	
S-1 (SINK/FAUCET)	MOEN/MOEN	GS202131Q/87557RB	SINGLE COMPARTMENT, ADA COMPLIANT, SELF-RIMMING, 18 GAUGE. SINGLE LEVER SWIVEL FAUCET. ONE ELKAY MODEL NO. LK35 BASKET STRAINER, P-TRAP, TAILPIECES, SUPPLIES AND STOPS. INSULATE WATER AND WASTE TO MEET ADA REQUIREMENTS. 1.5 GPM. PROVIDE WITH MOEN MODEL EX75C DISPOSAL.	2"	1 1/2"	1/2"	1/2"	
WC-1	KOHLER	K-5298	ELONGATED FLOOR MOUNTED TANK TYPE WATER CLOSET, WITH KOHLER CACHET QUIET-CLOSE CLOSED FRONT SEAT. PROVIDE A 1/4" BRASS BALL VALVE AT WALL CONNECTION. 1.0 GPF WATERSENSE LABELED.	3"	2"	1/2"		
WC-1A	KOHLER	K-5298	ELONGATED FLOOR MOUNTED TANK TYPE ADA COMPLIANT WATER CLOSET, WITH KOHLER CACHET QUIET-CLOSE CLOSED FRONT SEAT. PROVIDE A 1/4" BRASS BALL VALVE AT WALL CONNECTION. 1.0 GPF WATERSENSE LABELED.	3"	2"	1/2"		

CIRCULATION PUMP SCHEDULE

TAG	MANUFACTURER	MODEL	LOCATION	SERVICE	PUMP TYPE	FLOW (GPM)	HEAD (FT.)	NPSHA (FEET)	MOTOR DATA					OPERATIONAL WEIGHT (LBS)	SPECIFIC NOTES
									HP	VOLTS/PH/HZ	FLA	MCA	MOCP		
DCP-1	GRUNDFOS	26-99FC	UNITS	HOT WATER RECIRCULATION	DOMESTIC CIRCULATING	0.5	20	20	0.17	120/1/60	4.4	5.5	15	15	

GENERAL NOTES
1. PUMP TO BE LEAD FREE CONSTRUCTION AND APPROVED FOR USE IN POTABLE WATER SYSTEMS (NSF 61 CERTIFIED).
2. PROVIDE WITH AQUASTAT TO ENERGIZE PUMP WHEN PIPE TEMPERATURE DROPS TO 115°F AND DE-ENERGIZE PUMP WHEN PIPE TEMPERATURE REACHES 120°F.
3. PROVIDE WITH TIMER TO BE SET TO OWNER SPECIFIED HOURS OF OCCUPANCY.

PLOT DATE: 3/23/2022 8:03:14 AM

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, CO 80202
PH: 303.389.0095 | FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

Sheet Issue & Revision Log

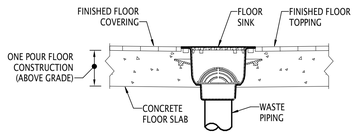
No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

PLUMBING SCHEDULES

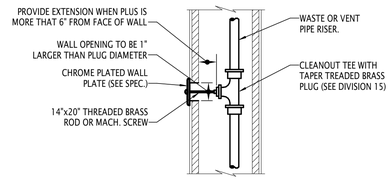
PG000

COPYRIGHT©



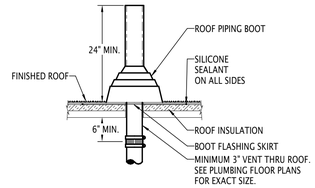
1 FLOOR SINK FLASHING DETAIL

NO SCALE



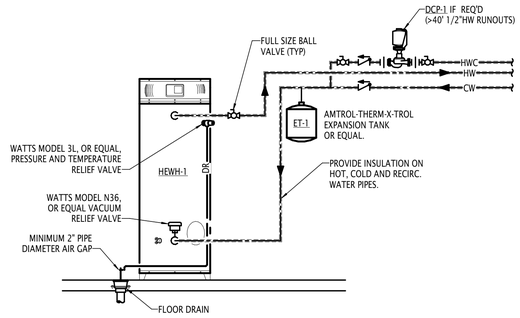
2 WALL CLEANOUT (WCO) (SIZES 1 1/2"-6")

NO SCALE



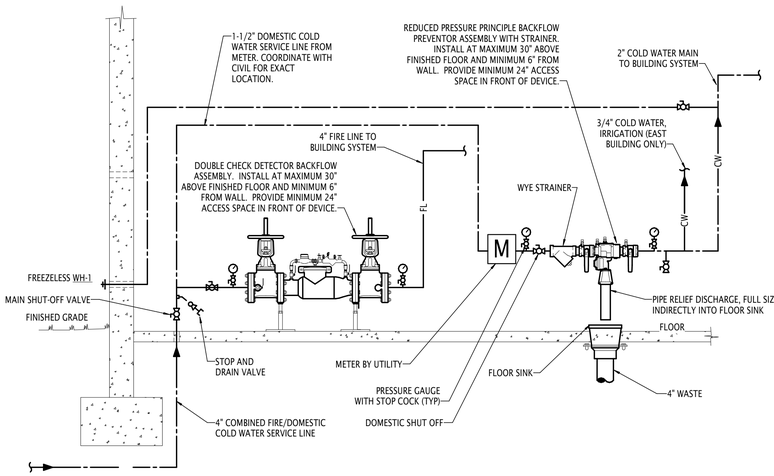
3 VENT THRU ROOF FLASHING DETAIL

NO SCALE



4 FLOOR MOUNTED HYBRID ELECTRIC WATER HEATER DETAIL

NO SCALE

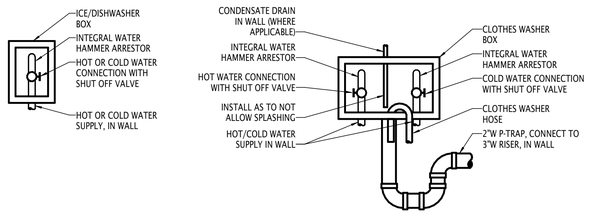


5 COMBINED DOMESTIC COLD WATER AND FIRE SERVICE ENTRY DETAIL

NO SCALE

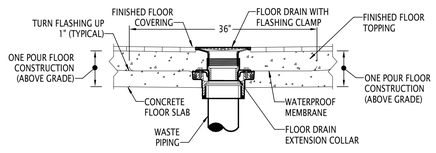
NOTES:

1. PROVIDE CONDENSATE PUMPS WHEN GRAVITY DRAINAGE IS NOT POSSIBLE.A SECONDARY DRAIN PAN SHALL BE PROVIDED UNDER THE COOLING COILS. SUCH PAN SHALL BE REQUIRED WITH A WATER LEVEL DETECTION DEVICE THAT WILL SHUT OFF THE EQUIPMENT SERVED PRIOR TO OVERFLOW OF THE PAN.
2. PROVIDE METAL BOX TYPE WITH QUARTER TURN VALVES UNLESS SPECIFIED OTHERWISE.



6 OUTLET BOX DETAIL

NO SCALE



7 FLOOR DRAIN FLASHING DETAIL

NO SCALE

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, CO 80202
PH: 303.389.0095 | FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

PLUMBING DETAILS

PG001

PLOT DATE: 3/23/2022 8:03:15 AM

COPYRIGHT©

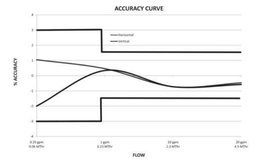
- California Approved (CTEP) – Both HOT & COLD
- National Approved (NTEP) – Both HOT & COLD
- NSF-61-G
- Meets AWWA C708
- Pulse output
- Meets UL2043 for Plenum Applications
- Gallons or Cubic Meter Register

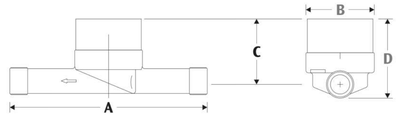
The polymer Versamag™ is the most versatile multijet type water meter for submetering applications. Along with its compact design, the removable register allows for pressure tests and line flush outs without damaging the internal components. The Versamag is capable of being installed in both horizontal and vertical positions while adhering to AWWA C708 accuracies. With all of these features the Versamag™ is the complete meter for any submetering applications.

* Cannot be installed vertically in California or NTEP states.

Technical Characteristics

Material	50% glass-reinforced nylon polymer
Max Flow Rate	**20 gpm (4.5 m³/hr)**
Normal Flow Range(+/- 1.5%)	1-20 gpm (0.23-4.5 m³/hr)
Nom Flow Rate	**15 gpm (3.4 m³/hr)**
Min Flow Rate(+/- 3%)	¼ gpm (0.06 m³/hr)
Max Work Pressure	**150 psi (10 Bar)**
Max Work Temp	105°F, 40°C (Cold), 160°F, 71°C (Hot)
Nom Pipe Size	**¾" (19 mm)**
Pulse Value	1/10gal (1/10L)





A – 7.5" (190.5 mm)
B – 2.5" (63.5 mm)
C – 3.6" (91.0 mm)
D – 4.2" (106.7 mm)
Wt 0.75lb (0.34kg)

©2009-2021 Norgas Metering Technologies, Inc. | 2021001

NMT is a division of Norgas Metering Technologies, Inc.

9840 Harwood Court ■ Fairfield, Ohio 45014 ■ 513.942.3600 - Office ■ 513.942.0096 - Fax ■ www.norgas.com

NOTE:

1. COORDINATE MANUFACTURER WITH OWNER.

1 WATER SUBMETER (BASIS OF DESIGN)
NO SCALE

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, CO 80202
PH: 303.389.0095 | FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

PLUMBING DETAILS

PG002

PLOT DATE: 3/23/2022 8:03:16 AM

COPYRIGHT©

PLUMBING SHEET INDEX

MODEL INFORMATION:
2022.03.25 BID SET
BASED ON BACKGROUNDS:
2021.10.26 - ARCHITECTURAL
- STRUCTURAL
- CAD BACKGROUNDS

SHEET NUMBER	SHEET TITLE	03.25.2022 BID SET
PG000	PLUMBING SCHEDULES	x
PG001	PLUMBING DETAILS	x
PG002	PLUMBING DETAILS	x
PE101	EAST LEVELS 1 & 2 PLUMBING PLAN	x
PE102	EAST LEVELS 3 & ROOF PLUMBING PLAN	x
PE201	EAST WASTE AND VENT ISOMETRIC	x
PE202	EAST DOMESTIC WATER ISOMETRIC	x
PW101	LEVELS 1 & 2 PLUMBING PLAN	x
PW102	LEVELS 3 & ROOF PLUMBING PLAN	x
PW201	WEST WASTE AND VENT ISOMETRIC	x
PW202	WEST DOMESTIC WATER ISOMETRIC	x

MECHANICAL SHEET INDEX

MODEL INFORMATION:
2022.03.25 BID SET
BASED ON BACKGROUNDS:
2021.10.26 - ARCHITECTURAL
- STRUCTURAL
- CAD BACKGROUNDS

SHEET NUMBER	SHEET TITLE	03.25.2022 BID SET
MG000	MECHANICAL LEGEND AND SHEET INDEX	x
MG001	MECHANICAL GENERAL NOTES	x
MG002	MECHANICAL SCHEDULES	x
MG003	MECHANICAL DETAILS	x
MG004	MECHANICAL DETAILS	x
ME101	EAST LEVELS 1 & 2 HVAC PLAN	x
ME102	EAST LEVELS 3 & ROOF HVAC PLAN	x
MW101	WEST LEVELS 1 & 2 HVAC PLAN	x
MW102	WEST LEVELS 3 & ROOF HVAC PLAN	x

MECHANICAL LEGEND

NOT ALL SYMBOLS SHOWN ARE NECESSARILY USED ON THESE DRAWINGS

HVAC DUCTWORK, AIR DEVICES AND SYMBOLS

SYMBOL	DESCRIPTION
18" x 12" / 18" x 12"	DOUBLE-LINE AND SINGLE LINE RECTANGULAR DUCT. FIRST NUMBER INDICATES WIDTH IN INCHES, SECOND NUMBER INDICATES DEPTH IN INCHES
18"Ø / 18"Ø	DOUBLE-LINE AND SINGLE LINE ROUND DUCT. NUMBER INDICATES DIAMETER IN INCHES.
18" x 12"	ACOUSTICAL LINED RECTANGULAR DUCT. SIZES GIVEN INDICATE CLEAR INSIDE DIMENSIONS IN INCHES.
	DOUBLE LINE AND SINGLE LINE CHANGE IN ELEVATION.
	DOUBLE-LINE AND SINGLE LINE EXISTING DUCTWORK TO REMAIN
	DOUBLE-LINE AND SINGLE LINE EXISTING DUCTWORK WHICH SHALL BE REMOVED OR RELOCATED AND REUSED WHERE POSSIBLE.
	FLEXIBLE DUCT
	FLEXIBLE CONNECTION
	DOUBLE-LINE AND SINGLE LINE DUCT TRANSITION
	DOUBLE-LINE AND SINGLE LINE RECTANGULAR DUCT ELBOW WITH TURNING VANES
	SINGLE LINE DUCT WITH RADIUS ELBOW
	DOUBLE-LINE AND SINGLE LINE RECTANGULAR 90° BEVELED DUCT BRANCH
	DOUBLE-LINE AND SINGLE LINE CONICAL TAP
	DOUBLE-LINE AND SINGLE LINE DUCT WITH SPIN-IN FITTING AND VOLUME DAMPER
UP / DOWN	
	RECTANGULAR DUCT SECTION, SUPPLY
	RECTANGULAR DUCT SECTION, RETURN
	RECTANGULAR DUCT SECTION, EXHAUST
	ROUND VERTICAL DUCT
MVD	MANUAL VOLUME DAMPER
BD	BACKDRAFT DAMPER
M	MOTORIZED (OPPOSED BLADE) DAMPER
M	MOTORIZED (PARALLEL BLADE) DAMPER
	FIRE DAMPER (WITH ACCESS PANEL)
	FIRE/SMOKE DAMPER (WITH ACCESS PANEL)
	DOUBLE LINE AND SINGLE LINE DUCT ENDCAP
	DUCT DETECTION
	SIDE WALL INLET, (EXHAUST) OUTLET, REGISTERS AND GRILLES
24"x24"	24"x24" ROUND NECK, SUPPLY AIR DIFFUSER WITH 4-WAY THROW
	LINEAR SUPPLY SLOT AIR DIFFUSER
	24"x24" RETURN AIR GRILLE
	24"x12" RETURN AIR GRILLE

AIR DEVICE / EQUIPMENT TAGS

AIR DEVICE DESIGNATION

TYPICAL QUANTITY — NECK CFM — DEVICE TYPE

TERMINAL UNIT DESIGNATION

TERMINAL UNIT DESIGNATION (VAV or FPB) — MAXIMUM PRIMARY AIR CFM SETTING — EQUIP-1 — KW or GPM — 1000 — 10 — 10 — NOMINAL INLET DIA. (IN) — ZONE NUMBER

SYMBOL	DESCRIPTION
T	THERMOSTAT
	THERMOSTAT CONTROL WIRING/TUBING
TS	TEMPERATURE SENSOR
H	HUMIDISTAT
CO	CARBON MONOXIDE SENSOR
CO_2	CARBON DIOXIDE SENSOR
NO_2	NITROGEN DIOXIDE SENSOR
	ACCESS PANEL (AP)
M	MOTOR
VFD	VARIABLE FREQUENCY MOTOR DRIVE (VFD)
3/4" UC	UNDERCUT DOOR BY MEASUREMENT INDICATED
	AIRFLOW SUPPLY
	AIRFLOW RETURN OR EXHAUST
	FILTER
	LOUVER (MINIMUM FREE AREA = 55%)
H C	HYDRONIC COIL

GENERAL / MISCELLANEOUS

SYMBOL	DESCRIPTION
OR	POINT OF CONNECTION TO EXISTING SYSTEM (POC)
# / X-X	DETAIL NUMBER OR PLUMBING RISER NUMBER
	SHEET NUMBER WHERE DETAIL FOR RISER IS SHOWN
	SECTION POINT OF VIEW
# / X-X	SECTION DESIGNATION
	SECTION NUMBER WHERE SECTION IS SHOWN
	BOLD LINES INDICATE NEW OR RELOCATED EQUIPMENT. NEW EQUIPMENT MAY BE NOTED (N). RELOCATED EQUIPMENT MAY BE NOTED (R).
	LIGHT LINES INDICATED EXISTING EQUIPMENT TO REMAIN. EXISTING EQUIPMENT MAY BE NOTED (E)
	DASHED LINES INDICATE EXISTING EQUIPMENT TO BE REMOVED OR RELOCATED AND REUSED WHERE POSSIBLE.

PLUMBING SPECIALTIES

SYMBOL	DESCRIPTION
	FLOOR DRAIN (FD)
	AREA DRAIN (AD)
	ROOF DRAIN/OVERFLOW ROOF DRAIN (RD/ORD)
	FLOOR SINK (FS) (ROUND OR SQUARE)
	FLOOR CLEANOUT (FCO)
	WALL CLEANOUT (WCO)
	WALL HYDRANT (WH)
	BACKFLOW PREVENTER (BFP)
	SHOCK ABSORBER WITH BALL VALVE (SA)
	VACUUM BREAKER (VB)

HVAC PIPING

LINETYPE	DESCRIPTION
	NEW PIPING (LINETYPE VARIES PER SYSTEM)
	EXISTING PIPING (LINETYPE VARIES PER SYSTEM)
	PIPE TO BE REMOVED
CDWS	CONDENSER WATER SUPPLY
CDWR	CONDENSER WATER RETURN
CHWS	CHILLED WATER SUPPLY
CHWR	CHILLED WATER RETURN
HWS	HEATING WATER SUPPLY
HWR	HEATING WATER RETURN
FOS	FUEL OIL SUPPLY
FOR	FUEL OIL RETURN
FOTV	FUEL OIL TANK VENT
RD	REFRIGERANT DISCHARGE
RS	REFRIGERANT SUCTION
RL	REFRIGERANT LIQUID
RHG	REFRIGERANT HOT GAS
HPS	HIGH PRESSURE STEAM
MPS	MEDIUM PRESSURE STEAM
LPS	LOW PRESSURE STEAM
SC	STEAM CONDENSATE

PLUMBING PIPING

LINETYPE	DESCRIPTION
	DOMESTIC COLD WATER
	DOMESTIC HOT WATER
	DOMESTIC HOT WATER CIRCULATING
G	NATURAL FUEL GAS
W	SANITARY WASTE (ABOVE FLOOR/GRADE)
W	SANITARY WASTE (BELOW FLOOR/GRADE)
GW	GREASE WASTE (ABOVE FLOOR/GRADE)
GW	GREASE WASTE (BELOW FLOOR/GRADE)
ST	STORM DRAIN (ABOVE FLOOR/GRADE)
ST	STORM DRAIN (BELOW FLOOR/GRADE)
OST	OVERFLOW STORM DRAIN (ABOVE FLOOR/GRADE)
OST	OVERFLOW STORM DRAIN (BELOW FLOOR/GRADE)
OR	DRAIN (ABOVE FLOOR/GRADE)
OR	DRAIN (BELOW FLOOR/GRADE)
V	SANITARY VENT
CA	COMPRESSED AIR
VAC	VACUUM

FIRE PROTECTION

LINETYPE / SYMBOL	DESCRIPTION
FL	FIRE LINE SERVICE
DFL	DRY FIRE LINE SERVICE
	OUTSIDE SCREW AND YOKE (OS&Y) GATE VALVE
	DRY PIPE FIRE VALVE
FS	FLOW SWITCH
	FREE STANDING FIRE DEPT. CONNECTION
	WALL MOUNTED FIRE DEPT. CONNECTION
S	SPEAKER/HORN
SH	SPEAKER/HORN & STROBE
	FIRE ALARM BELL
	FIRE HYDRANT

PIPE FITTINGS

LINETYPE	DESCRIPTION
	VERTICAL PIPE (UP OR DOWN)
	PIPING CAP OR PLUG
	PIPING ELBOW UP
	PIPING ELBOW DOWN
	PIPING REDUCER, CONCENTRIC
	PIPING REDUCER, ECCENTRIC (FLAT ON TOP)
	PIPING REDUCER, ECCENTRIC (FLAT ON BOTTOM)
	PIPING ELBOW DOWN TO TEE
	PIPING ELBOW UP TO TEE
	PIPING TEE UP
	PIPING TEE DOWN
	UNION, SCREWED
	UNION, FLANGED

VALVES AND SPECIALTIES

SYMBOL	DESCRIPTION
	BALL VALVE
	BUTTERFLY VALVE
	GATE VALVE
	GLOBE VALVE
	HOSE END VALVE
	PRESSURE REDUCING VALVE
M	ELECTRIC MOTORIZED AUTOMATIC BALL CONTROL VALVE, 2-WAY
M	ELECTRIC MOTORIZED AUTOMATIC BUTTERFLY CONTROL VALVE, 2-WAY
M	ELECTRIC MOTORIZED AUTOMATIC CONTROL VALVE, 3-WAY
	PNEUMATIC AUTOMATIC BALL CONTROL VALVE, 2-WAY
S	SOLENOID VALVE
	GAUGE COCK VALVE
	CHECK VALVE
	GAS COCK OR PLUG VALVE
	VENTURI METER
FT	VENTURI FLOW TRANSMITTER
	PRESSURE RELIEF VALVE
	STRAINER
	STRAINER WITH BLOW-OFF
	BALANCING COCK
	COMBINATION BALANCING COCK/ FLOW MEASURING DEVICE
	FLEXIBLE PIPE CONNECTOR
	AIR VENT - AUTOMATIC
	AIR VENT - MANUAL
TS	TEMPERATURE SENSOR
PS	PRESSURE SWITCH
PT	PRESSURE TRANSDUCER
M	METER
	PRESSURE/TEMPERATURE TEST POINT
	PRESSURE GAUGE
	PRESSURE GAUGE AND COCK
	PIPE ALIGNMENT GUIDE
	PIPE ANCHOR
	THERMOMETER
	THERMOMETER AND THERMOWELL
U	EXPANSION PIPE JOINT
	SIGHT GLASS
	OPEN FUNNEL DRAIN

PIPE SYMBOLS

SYMBOL	DESCRIPTION
DN UP	INDICATION OF PITCH GOING DOWN OR UP
	DIRECTION OF FLOW

ABBREVIATIONS

ABBR.	DESCRIPTION
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
BHP	BRAKE HORSEPOWER
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BTUH	BRITISH THERMAL UNITS PER HOUR
CFM	CUBIC FEET/AIR PER MINUTE
CLNG	CEILING
DB	DRY BULB TEMPERATURE
DIA	DIAMETER
DN	DOWN
DWG	DRAWING
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EFF	EFFICIENCY
ELEV	ELEVATION
EWT	ENTERING WATER TEMPERATURE
(E)	EXISTING
ESP	EXTERNAL STATIC PRESSURE
FLR	FLOOR
FPM	FEET PER MINUTE
GAL	GALLON
GALV	GALVANIZED
GPM	GALLONS PER MINUTE
HOA	HAND/OFF/AUTOMATIC
HP	HORSEPOWER
HTG	HEATING
IBC	INTERNATIONAL BUILDING CODE
IMC	INTERNATIONAL MECHANICAL CODE
IPC	INTERNATIONAL PLUMBING CODE
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE
LWT	LEAVING WATER TEMPERATURE
MAX	MAXIMUM
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL
MFR	MANUFACTURER
MIN	MINIMUM
(N)	NEW
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
NG	NATURAL GAS
N/A	NOT APPLICABLE
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OC	ON CENTER
PE	PNEUMATIC - ELECTRIC
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
RA	RETURN AIR
RH	RELATIVE HUMIDITY
RPM	REVOLUTIONS PER MINUTE
SA	SUPPLY AIR
SD	SMOKE DETECTOR
SP	STATIC PRESSURE
SPEC	SPECIFICATION
STD	STANDARD
TEMP	TEMPERATURE
TOD	TOP OF DUCT
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VAV	VARIABLE AIR VOLUME
VEL	VELOCITY
VTR	VENT THROUGH ROOF
WB	WET BULB TEMPERATURE
W/O	WITHOUT

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, COLORADO 80202
PH: 303.389.0095 | FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

MECHANICAL LEGEND AND SHEET INDEX

MG000

PLOT DATE: 3/23/2022 8:12:28 AM

COPYRIGHT©

MECHANICAL GENERAL NOTES

CONTRACTOR SHALL COMPLY WITH NOTES AS APPLICABLE TO PROJECT. NOTES ON INDIVIDUAL DRAWING TAKE PRECENDENCE.

A. GENERAL:

1. REFER TO SPECIFICATIONS, DRAWINGS, GENERAL CONDITIONS AND DIVISION 1 FOR SUPPLEMENTAL REQUIREMENTS.
2. THE CONTRACTOR SHALL VISIT AND EXAMINE THE PREMISES AND/OR JOB SITE SO AS TO ASCERTAIN, PRIOR TO BIDDING, THE EXISTING CONDITIONS IN WHICH HE WILL BE OBLIGED TO OPERATE IN PERFORMING HIS PART OF THE CONTRACT. NO EXTRAS WILL BE ALLOWED DUE TO LACK OF KNOWLEDGE OF THESE CONDITIONS.
3. INSTALL ALL EQUIPMENT AND MATERIALS IN SUCH A MANNER AS TO PROVIDE REQUIRED ACCESS FOR SERVICING AND MAINTENANCE. ALLOW AMPLE SPACE FOR REMOVAL OF ALL PARTS THAT REQUIRE REPLACEMENT OR SERVICING.
4. FURNISH HINGED STEEL ACCESS DOORS WITH CONCEALED LATCH, WHETHER SHOWN ON DRAWINGS OR NOT, WHERE REQUIRED FOR ACCESS TO ALL CONCEALED VALVES, SHOCK ABSORBERS, MOTORS, FANS, BALANCING COCKS, AND/OR OTHER OPERATING DEVICES REQUIRING ADJUSTMENT OR SERVICING. ACCESS DOORS IN FIRE-RATED WALLS AND CEILINGS SHALL HAVE EQUIVALENT U.L. LABEL AND FIRE RATING.
5. IT IS THE INTENTION OF THESE SPECIFICATIONS AND DRAWINGS TO CALL FOR FINISHED WORK, TESTED AND READY FOR OPERATION. WHEREVER THE WORD "PROVIDE" IS USED, IT SHALL MEAN "FURNISH AND INSTALL COMPLETE AND READY FOR USE."
6. SECURE AND PAY FOR ALL PERMITS, TAP FEES, TAXES, ROYALTIES, LICENSES, AND INSPECTIONS IN CONNECTION WITH THE WORK SPECIFIED UNDER THIS DIVISION.
7. ALL WORK SHALL COMPLY WITH ALL APPLICABLE CODES AND REGULATIONS.
8. DRAWINGS ARE DIAGRAMMATIC IN CHARACTER AND DO NOT NECESSARILY INDICATE EVERY REQUIRED OFFSET, VALVE, FITTING, ETC.
9. DRAWINGS SHALL NOT BE SCALED FOR ROUGH-IN MEASUREMENTS OR USED AS SHOP DRAWINGS. ALL DIMENSIONS SHALL BE VERIFIED IN FIELD.
10. ALL NEW MATERIALS IN CEILING PLENUMS SHALL BE CLASS 1 RATED, NOT EXCEEDING RATING OF 25 FLAME SPREAD AND 50 SMOKE DEVELOPED. REMOVE AND REPLACE ALL EXISTING MATERIALS NOT IN COMPLIANCE.
11. BEFORE ANY EQUIPMENT IS ORDERED AND/OR INSTALLED, DETERMINE THAT SAID EQUIPMENT WILL PROPERLY FIT WITHIN THE SPACE ALLOCATED; THAT REQUIRED PIPING GRADES CAN BE MAINTAINED; AND THAT DUCTWORK CAN BE RUN AS INTENDED.
12. COORDINATE THE INSTALLATION OF MECHANICAL MATERIALS AND EQUIPMENT ABOVE AND BELOW CEILINGS, LIGHT FIXTURES, AND OTHER BUILDING COMPONENTS. ALL COMPONENTS SHALL BE LOCATED AS TIGHT TO STRUCTURE AS POSSIBLE. COORDINATE CEILING CAVITY SPACE CAREFULLY WITH ALL TRADES.
13. NOT ALL DETAILS OF PIPING SYSTEMS ARE SHOWN ON DRAWINGS NOR ARE THEY SPECIFIED HEREIN. PIPING SHALL BE SUCH AS TO LEGALLY PASS ALL INSPECTIONS BY THE LOCAL INSPECTION DEPARTMENT, STATE AND FEDERAL AUTHORITIES HAVING JURISDICTION.
14. ALL ROOF AND EXTERIOR PENETRATIONS SHALL BE SEALED WATER TIGHT. PROVIDE FLASHING AND COUNTER FLASHING AS REQUIRED. COORDINATE ROOFING WORK WITH THE GENERAL CONTRACTOR.
15. CONTRACTOR SHALL NOTIFY ENGINEER 96 HOURS PRIOR TO SUBSTANTIAL COMPLETION OF CONSTRUCTION OR INSTALLATION OF CEILING TILE, TO SCHEDULE A FINAL PUNCH LIST WALKTHROUGH.
16. ALL MATERIALS AND EQUIPMENT SHALL BE NEW, FREE OF DEFECTS, AND INSTALLED IN ACCORDANCE WITH MANUFACTURER'S CURRENT PUBLISHED RECOMMENDATIONS.
17. CONTRACTOR SHALL PREPARE AND SUBMIT TO THE ARCHITECT/ENGINEER IN ELECTRONIC (PDF) FORMAT, ALL SHOP DRAWINGS AND DESCRIPTIVE EQUIPMENT DATA/SUBMITTALS REQUIRED FOR THE PROJECT. SUBMITTALS AND SUBMITTAL SCHEDULE SHALL BE PREPARED AND SIGNED BY A QUALIFIED DESIGN PROFESSIONAL. THE CONTRACTOR SHALL IDENTIFY ANY 'LONG LEAD TIME' ITEMS, WHICH MAY IMPACT THE OVERALL PROJECT SCHEDULE. ALL BIDS SHALL INCLUDE COSTS ASSOCIATED WITH THE PURCHASE AND DELIVERY OF EQUIPMENT TO MEET THE PROJECT SCHEDULE. ALL SUBMITTALS SHALL BE CLEAR AND CONCISE. PARTIAL, PROGRESS, 'PIECEMEAL,' OR CATALOGUES WILL NOT BE REVIEWED AND WILL BE RETURNED AS INCOMPLETE - NO EXCEPTIONS. ALLOW A MINIMUM OF 10 WORKING DAYS FOR ARCHITECT/ENGINEER'S REVIEW.
18. REVIEW OF THE EQUIPMENT SUBMITTALS IS CONTINGENT ON WHETHER THE PHYSICAL DIMENSIONS OF THE SUBMITTED EQUIPMENT WILL FIT INTO ALLOTED SPACES WITH CLEARANCE FOR INSTALLATION AND MAINTENANCE. CONTRACTOR SHALL VERIFY PRIOR TO ORDERING AND INSTALLATION.
19. CONTRACTOR SHALL SUBMIT 1/4" SCALE COORDINATION/SHOP DRAWINGS SHOWING ALL DUCTWORK, PIPING, PLUMBING, ETC. CONTRACTOR SHALL SUBMIT ALL LOCATIONS OF ACCESS PANELS FOR APPROVAL BY ARCHITECT/ENGINEER 4 MONTHS PRIOR TO INSTALLATION.
20. QUIET OPERATION AND VIBRATION: MECHANICAL EQUIPMENT PROVIDED UNDER THIS CONTRACT SHALL OPERATE UNDER ALL LOAD CONDITIONS WITHOUT NOISE OR VIBRATION, WHICH IS OBJECTIONABLE IN THE OPINION OF THE ENGINEER.
21. KEEP A COMPLETE SET OF RECORD DOCUMENT PRINTS IN CUSTODY DURING ENTIRE PERIOD OF CONSTRUCTION AT THE CONSTRUCTION SITE. AT THE COMPLETION OF THE PROJECT, TURN THESE DRAWINGS OVER TO THE GENERAL CONTRACTOR FOR HIS SUBMISSION TO THE ARCHITECT.
22. THE CONTRACTOR FOR THIS WORK SHALL EXAMINE THE DRAWINGS AND SPECIFICATIONS FOR OTHER PARTS OF THE WORK, AND IF HEADROOM OR SPACE CONDITIONS APPEAR INADEQUATE OR IF ANY DISCREPANCIES OCCUR BETWEEN THE PLANS FOR HIS WORK AND THE PLANS FOR THE WORK OF OTHERS, HE SHALL REPORT SUCH DISCREPANCIES TO THE ARCHITECT/ENGINEER AND SHALL OBTAIN WRITTEN INSTRUCTIONS FOR ANY CHANGES NECESSARY TO ACCOMMODATE HIS WORK WITH THE WORK OF OTHERS. ANY CHANGES IN THE WORK COVERED BY THIS SPECIFICATION MADE NECESSARY BY THE FAILURE OR NEGLECT OF THE CONTRACTOR TO REPORT SUCH DISCREPANCIES SHALL BE MADE BY AND AT THE EXPENSE OF THIS CONTRACTOR.
23. EQUIPMENT SCHEDULES ESTABLISH A QUALITY AND DESIGN STANDARD. SUBSTITUTIONS MUST BE EQUIVALENT IN PERFORMANCE, MATERIAL, SPACE, AND CONFIGURATION REQUIREMENTS. THE PROJECT ENGINEER OR ARCHITECT'S DECISION WILL BE FINAL AND MAY BE BASED ON BOTH CERTIFIED TEST DATA AND SUBJECTIVE REASONING.
24. THE MANUFACTURER'S MATERIAL OR EQUIPMENT LISTED IN THE SCHEDULE OR IDENTIFIED BY NAME ON THE DRAWINGS ARE THE TYPES TO BE PROVIDED FOR THE ESTABLISHMENT OF SIZE, CAPACITY, GRADE AND QUALITY. IF ALTERNATES ARE USED IN LIEU OF THE SCHEDULED NAMES, THE COST OF ANY CHANGES IN CONSTRUCTION REQUIRED BY THEIR USE SHALL BE BORNE BY CONTRACTOR.
25. OPERATING AND MAINTENANCE DATA: THE CONTRACTOR SHALL PREPARE AN OPERATING AND MAINTENANCE MANUAL COVERING ALL SYSTEMS AND EQUIPMENT INSTALLED UNDER THIS DIVISION. SUBMIT AN OUTLINE OF A PREVENTATIVE MAINTENANCE PROGRAM FOR EACH SYSTEM. CONTRACTOR SHALL PROPERLY LUBRICATE ALL MECHANICAL PIECES OF EQUIPMENT, WHICH HE HAS PROVIDED BEFORE TURNING THE BUILDING OVER TO THE OWNER.
26. WARRANTIES:
    1. PROVIDE COMPLETE WARRANTY INFORMATION FOR EACH ITEM, INCLUDING, NAME OF PRODUCT OR EQUIPMENT; DATE OF BEGINNING OF WARRANTY OR BOND; DURATION OF WARRANTY OR BOND; AND NAMES, ADDRESSES, AND TELEPHONE NUMBERS OF MANUFACTURING/SERVICING PERSONNEL, AS WELL AS, PROCEDURES FOR FILING A CLAIM AND OBTAINING WARRANTY SERVICES.
    2. THE CONTRACTOR SHALL WARRANT ALL MATERIALS, WORKMANSHIP AND THE SUCCESSFUL OPERATION OF ALL EQUIPMENT AS IDENTIFIED IN THE GENERAL CONDITIONS, OR DIVISION 1.
27. ANY FILTERS USED DURING CONSTRUCTION SHALL BE REPLACED WITH NEW FILTERS DURING FINAL CLEANUP.
28. RESPONSIBILITY OF CONTRACTOR: THE CONTRACTOR IS RESPONSIBLE FOR THE COMPLETE AND SATISFACTORY INSTALLATION OF THE WORK IN ACCORDANCE WITH THE TRUE INTENT OF THE DRAWINGS AND SPECIFICATIONS. HE SHALL PROVIDE, WITHOUT EXTRA CHARGE, ALL INCIDENTAL ITEMS REQUIRED, AS A PART OF HIS WORK. THE INSTALLATION SHALL BE MADE SO THAT ITS SEVERAL COMPONENT PARTS WILL FUNCTION TOGETHER AS A WORKABLE SYSTEM AND SHALL BE LEFT WITH ALL PARTS ADJUSTED AND IN WORKING ORDER.

B. MECHANICAL/ELECTRICAL REQUIREMENTS FOR MECHANICAL EQUIPMENT:

1. CONTRACTOR SHALL REVIEW ELECTRICAL POWER REQUIREMENTS FOR MECHANICAL EQUIPMENT THAT ARE SCHEDULED ON THE ELECTRICAL DRAWINGS AND VERIFY THEY MATCH PRIOR TO ORDERING EQUIPMENT. DO NOT PURCHASE MOTORS OR ELECTRICAL EQUIPMENT UNTIL POWER CHARACTERISTICS AVAILABLE AT BUILDING SITE LOCATION HAVE BEEN CONFIRMED BY CONTRACTOR.
2. PROVIDE SAFETY DISCONNECT SWITCHES FOR ALL MECHANICAL EQUIPMENT, UNLESS SPECIFICALLY SHOWN ON THE ELECTRICAL DIVISION.
3. FURNISH COMBINATION TYPE FULL NEMA RATED STARTERS WITH FUSED DISCONNECT SWITCH FOR ALL 3-PHASE MOTORS PROVIDED.
4. ELECTRICAL WIRING IN CONNECTION WITH THE AUTOMATIC TEMPERATURE CONTROL SYSTEM, INCLUDING INTERLOCK WIRING, WHERE SHOWN ON THE ELECTRICAL DIVISION DRAWINGS, SHALL BE PERFORMED BY THE ELECTRICAL CONTRACTOR. ALL OTHER WIRING, INCLUDING 120V REQUIRED FOR PROPER OPERATION OF THE AUTOMATIC TEMPERATURE CONTROL SYSTEM, SHALL BE PERFORMED BY THE MECHANICAL CONTRACTOR.
5. IT IS THE INTENT OF THIS SPECIFICATION THAT ONE GENERAL CONTRACTOR ENTERS INTO AN AGREEMENT WITH THE OWNER. THE USE AND COORDINATION OF SUBCONTRACTORS IS AT THE OPTION OF THE GENERAL CONTRACTOR. ALL MECHANICAL EQUIPMENT, MOTORS AND CONTROLS SHALL BE FURNISHED, SET IN PLACE, AND WIRED. THE EXACT FURNISHING AND INSTALLATION OF THE EQUIPMENT SHALL BE COORDINATED BY THE CONTRACTORS INVOLVED.

C. MECHANICAL, PLUMBING AND FIRE PROTECTION SYSTEMS FIRESTOPPING:

1. CONTRACTOR SHALL PROVIDE FIRESTOP SYSTEM FOR ALL THROUGH PENETRATIONS OF PIPING, DUCTWORK AND OTHER MECHANICAL ITEMS THROUGH FIRE-RATED CORRIDOR WALLS, FIRE RESISTIVE WALLS, FIRE RESISTIVE SHAFTS AND FLOOR PENETRATIONS NOT WITHIN THE CAVITY OF A WALL. FIRESTOP SYSTEM SHALL BE LISTED/INSTALLED/TESTED IN ACCORDANCE WITH ASTM E814 OR UL 1479. THE SYSTEM SHALL HAVE AN F RATING/ T RATING OF NOT LESS THAN 1 HR AND NOT LESS THAN THE REQUIRED RATING OF THE PENETRATING ASSEMBLY. CONTRACTOR SHALL ALSO REFERENCE AND COMPLY WITH 2018 IBC SECTION 714.4.1.2.

D. PIPING APPLICATION:

1. ALL PIPING SHALL CONFORM TO APPLICABLE NATIONAL AND LOCAL CODES.
2. DOMESTIC HOT AND COLD WATER: ABOVE GRADE, INSIDE BUILDING; TYPE " L" HARD DRAWN COPPER TUBE, 95-5 TIN-ANTIMONY SOLDERED JOINTS. BELOW GRADE, INSIDE AND OUTSIDE BUILDING; 3" AND SMALLER: TYPE "K" SOFT DRAWN COPPER WITH SILVER BRAZED SOLDER JOINTS, 4" AND LARGER: DUCTILE IRON, TAR COATED OUTSIDE, CEMENT MORTAR LINED INSIDE.
3. SANITARY DRAINAGE, STORM DRAINAGE AND VENTS - INSIDE BUILDING; ABOVE GRADE: CISPI 301 CAST IRON, NO-HUB TYPE, WITH NEOPRENE GASKETS AND 300 SERIES STAINLESS STEEL CLAMPS; BELOW GRADE: ASTM A-74 SERVICE WEIGHT CAST IRON, HUB-AND-SPIGOT TYPE ONLY, WITH NEOPRENE COMPRESSION GASKETS. BEYOND 5 FEET OUTSIDE BUILDING; UNLESS SPECIFIED BY CIVIL, ASTM D-3034 SDR-35 PVC SEWER PIPE.
4. NATURAL GAS PIPING, ABOVE GRADE, EXPOSED LOCATIONS, 2" AND SMALLER: SCHEDULE 40 BLACK STEEL PIPE, BEVELED ENDS, WITH 150 PSI MALLEABLE IRON FITTINGS AND THREADED JOINTS. INACCESSIBLE LOCATIONS, BELOW GRADE OR LARGER THAN 2" : SCHEDULE 40 BLACK STEEL PIPE WITH SEAMLESS STEEL BUTT-WELD FITTINGS AND WELDED JOINTS. FOR BELOW GRADE GAS PIPING, PROVIDE PIPING WITH MACHINE-APPLIED COATING AND WRAPPING IN ACCORDANCE WITH LOCAL CODE AND UTILITY COMPANY REQUIREMENTS. PROVIDE CATHODIC PROTECTION.
5. FOR GAS PIPING INSTALLED ON ROOF SHALL BE SUPPORTED AT A MINIMUM OF EVERY 6 FEET, WITH 6" MINIMUM CLEARANCE FROM ROOF, EXCEPT WHERE GOVERNED BY MORE STRINGENT LOCAL CODES OR SPECIFICATIONS.
6. EXPOSED GAS PIPING SHALL BE LABELED WITH GAS PRESSURE AND PAINTED.
7. PROVIDE FULL-SIZED SHUT-OFF VALVE, PRESSURE REGULATOR (VENTED TO OUTSIDE) AND 6" DRIP LEG FOR CONNECTIONS TO GAS-FIRED EQUIPMENT.
8. SPACE HEATING WATER, CHILLED WATER, AND CONDENSER WATER PIPING; 2-1/2" AND SMALLER: TYPE L COPPER TUBE, ASTM B-88, WITH WROUGHT COPPER FITTINGS PER ANSI B16.22, BRAZED OR LEAD-FREE SOLDERED. 3" AND LARGER: SCHEDULE 40 BLACK STEEL WITH FLANGED OR WELDED JOINTS.
9. EQUIPMENT DRAINS, CONDENSATE DRAINS AND OVERFLOWS; TYPE "M" OR "DWV" COPPER.
10. REFRIGERANT PIPING (FIELD INSTALLED):TYPE "K" HARD-DRAWN COPPER TUBING WITH WROUGHT COPPER SILVER SOLDERED FITTINGS AND COUPLINGS; OR TYPE "L" COPPER, REFRIGERANT GRADE, COLOR CODED AND MARKED "ACR" WITH BRAZED JOINTS. SOFT-ANNEALED COPPER TUBING MAY BE USED IN SIZES UP TO 1-3/8", AND, WHEN USED, SHALL BE ENCLOSED IN IRON OR STEEL PIPING OR IN CONDUIT, MOLDING OR RACEWAY WHICH WILL PROTECT SAID TUBING AGAINST DAMAGE.

E. PIPING INSTALLATION:

1. GENERAL: INSTALL PIPES AND PIPE FITTINGS IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES, WHICH WILL ACHIEVE PERMANENTLY LEAK-PROOF PIPING SYSTEMS, CAPABLE OF PERFORMING EACH INDICATED SERVICE WITHOUT PIPING FAILURE. INSTALL EACH RUN WITH MINIMUM JOINTS AND COUPLINGS, BUT WITH ADEQUATE AND ACCESSIBLE UNIONS FOR DISASSEMBLY AND MAINTENANCE/REPLACEMENT OF VALVES AND EQUIPMENT.
2. SANITARY WASTE AND VENT; ROOF DRAIN; AND STORM DRAIN PIPING:
    1. VERIFY ALL INVERT ELEVATIONS OF EXISTING WASTE AND STORM DRAIN PIPING PRIOR TO ANY NEW WORK.
    2. INSTALL PLUMBING DRAINAGE PIPING WITH MINIMUM 1/4" PER FOOT (2%) DOWNWARD SLOPE IN DIRECTION OF DRAIN FOR PIPING 3" AND SMALLER. INSTALL 4" AND LARGER PIPING WITH MINIMUM 1/8" PER FOOT (1%) DOWNWARD SLOPE, UNLESS OTHERWISE INDICATED ON DRAWINGS AND WHEN APPROVED BY ADMINISTRATIVE AUTHORITIES.
    3. GRADE VENT PIPING FOR PROPER VENTILATION (MINIMUM 1/8" PER FOOT) AND TO ALLOW PIPING TO FREE ITSELF QUICKLY OF CONDENSATION OF WATER.
3. ELECTRICAL EQUIPMENT SPACES: DO NOT RUN PIPING THROUGH TRANSFORMER VAULTS AND OTHER ELECTRICAL OR ELECTRONIC EQUIPMENT SPACES AND ENCLOSURES. ONLY PIPING SERVING THIS TYPE OF EQUIPMENT SPACE SHALL BE ALLOWED.
4. CONTRACTOR SHALL FIELD VERIFY ALL PIPING AND PLUMBING LOCATIONS AND INVERTS PRIOR TO TRENCHING OR INSTALLATION OF NEW PIPING. ALLOW FOR COST OF X-RAYING FLOOR FOR LOCATING BURIED PIPING AND PRIOR TO MAKING FLOOR PENETRATIONS.
5. USE FITTINGS FOR ALL CHANGES IN DIRECTION AND ALL BRANCH CONNECTIONS.
6. ANCHOR PIPING TO ENSURE PROPER DIRECTION OF EXPANSION AND CONTRACTION.
7. INSTALL HANGERS AND GUIDES AS NECESSARY FOR PIPING SYSTEMS, WHICH ARE SELF-SUPPORTING AND NOT DEPENDENT UPON CONNECTION TO EQUIPMENT. ALL PIPING SHALL BE ADEQUATELY SUPPORTED FROM THE BUILDING STRUCTURE WITH ADJUSTABLE HANGERS TO MAINTAIN UNIFORM GRADING, WHERE REQUIRED AND TO PREVENT SAGGING AND POCKETING.
8. ALLOW FLEXIBILITY IN THE CONSTRUCTION OF THE PIPING SYSTEM IN ORDER TO PREVENT EXCESSIVE STRESSES IN MATERIALS AND JOINTS DUE TO THERMAL EXPANSION OR EQUIPMENT VIBRATION. PROVIDE SUFFICIENT SWING JOINTS, ANCHORS, EXPANSION LOOPS, EXPANSION JOINTS, AND/OR OTHER DEVICES AS NECESSARY, AND INSTALL SO AS TO PERMIT FREE EXPANSION AND CONTRACTION WITHOUT CAUSING UNDUE STRESSES. PROVIDE BRACING WHERE NECESSARY TO PREVENT SWAYING.
9. PROVIDE SHUTOFF VALVES AND UNIONS OR FLANGES TO ISOLATE EACH ITEM OF EQUIPMENT.
10. ARRANGE PIPING AND VALVES NEAR EACH PIECE OF EQUIPMENT TO ALLOW FOR COMPLETE SERVICE AND MAINTENANCE OF THE EQUIPMENT WITHOUT DISTURBING THE SHUTOFF VALVES.
11. PROVIDE DIELECTRIC UNIONS AT ALL JUNCTIONS OF DISSIMILAR METALS.
12. PROVIDE SHEET METAL SHIELDS FOR PIPING 2" AND SMALLER (EXCEPT WHERE REQUIRED TO BE CLAMPED) AND CALCIUM SILICATE THERMAL INSERT WITH SHEET METAL SHIELDS FOR PIPING LARGER THAN 2" AND FOR ALL SIZES OF INSULATED PIPING REQUIRED TO BE CLAMPED.
13. PROVIDE ELECTROLYSIS ISOLATORS AT ALL HANGERS AND SUPPORTS FOR DOMESTIC WATER, CONDENSER WATER, AND OTHER WATER LINES WHICH ARE NOT INSULATED.
14. TEST ALL PIPING SYSTEMS. CORRECT LEAKS BY REMAKING JOINTS. GIVE A MINIMUM OF TWENTY-FOUR (24) HOURS NOTICE TO ENGINEER OF DATES WHEN ACCEPTANCE TEST WILL BE CONDUCTED.
15. ALL PIPING SHALL BE CLEANED AND FLUSHED PRIOR TO SERVICE.
16. NEW DOMESTIC WATER SUPPLY AND DISTRIBUTION SYSTEMS SHALL BE PURGED AND STERILIZED BEFORE ACCEPTANCE FOR OPERATION, IN ACCORDANCE WITH IPC 2018 SECTION 610.

F. ROOF EQUIPMENT SUPPORTS:

1. CONSTRUCT ROOF EQUIPMENT SUPPORTS USING MINIMUM 18-GA GALVANIZED STEEL WITH FULLY MITERED AND WELDED CORNERS, 3" CANT, INTERNAL BULKHEAD REINFORCING, INTEGRAL BASE PLATES, PRESSURE TREATED WOOD NAILER, 18-GA GALVANIZED STEEL COUNTERFLASHING AND RIGID INSULATION.

G. EQUIPMENT SUPPORTS:

- PROVIDE HOUSEKEEPING BASES FOR ALL FLOOR-MOUNTED MECHANICAL EQUIPMENT. BASES SHALL BE 4" THICK MINIMUM, AND EXTENDED 6" BEYOND MACHINERY BEDPLATES.

H. MECHANICAL IDENTIFICATION:

1. LABEL ALL DUCT ACCESS DOORS, PIPING, EQUIPMENT AND THERMOSTATS. PIPING AND EQUIPMENT SHALL BE IDENTIFIED WITH LETTERS 2" HIGH AND 6" FLOW ARROWS.

I. VIBRATION CONTROL:

1. ALL MECHANICAL EQUIPMENT, PIPING AND DUCTWORK AS NOTED OR IN THE SPECIFICATION, SHALL BE MOUNTED ON VIBRATION ISOLATORS TO PREVENT THE TRANSMISSION OF VIBRATION AND MECHANICALLY TRANSMITTED SOUND TO THE BUILDING STRUCTURE. VIBRATION ISOLATORS SHALL BE SELECTED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND THE WEIGHT DISTRIBUTION, SO AS TO PRODUCE REASONABLY UNIFORM DEFLECTION.

J. WATER DISTRIBUTION SYSTEM:

1. ALL EQUIPMENT AND FIXTURES, WHICH ARE CONNECTED TO A POTABLE WATER SUPPLY, SHALL BE INSTALLED IN SUCH A MANNER AS TO ELIMINATE THE POSSIBILITY OF ANY PHYSICAL OR POTENTIAL CROSS-CONNECTION. VACUUM BREAKERS SHALL BE PROVIDED FOR ALL SUBMERGED/ENCLOSED OUTLETS AND INSTALLED A MINIMUM OF 6" ABOVE OVERFLOW RIM.
2. INSTALL BACKFLOW PREVENTERS ON PLUMBING LINES WHERE CONTAMINATION OF DOMESTIC WATER MAY OCCUR.
3. INSTALL PRESSURE REDUCING VALVES TO LIMIT MAXIMUM PRESSURE AT PLUMBING FIXTURES TO 65 PSIG.
4. INSTALL WATER HAMMER ARRESTERS IN DOMESTIC WATER PIPING SYSTEM AT EACH SET OF FLUSH VALVES AND IN OTHER LOCATIONS WHERE HYDROSTATIC SHOCK PRESSURES COULD OCCUR.

K. PLUMBING FIXTURES:

1. WHERE FIXTURES ARE SPECIFIED AS HANDICAPPED-ACCESSIBLE, IT SHALL BE THE SOLE RESPONSIBILITY OF ALL MANUFACTURERS AND/OR SUPPLIERS TO PROVIDE PLUMBING FIXTURES AND RELATED TRIM, WHICH MEET OR EXCEED THE ADA REQUIREMENTS. COORDINATE WITH ARCHITECTURAL DRAWINGS.
2. FIXTURE MOUNTING HEIGHT AND ROUGH-IN DIMENSIONS SHALL BE AS INDICATED ON THE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.
3. INSTALL DRAIN FLASHING COLLAR OR FLANGE, SO THAT NO LEAKAGE OCCURS BETWEEN DRAIN AND ADJOINING FLOORING. MAINTAIN INTEGRITY OF WATERPROOF MEMBRANES, WHERE PENETRATED.
4. PROVIDE ISOLATION VALVES AT ALL PLUMBING FIXTURES.

L. METAL DUCTWORK:

1. RECTANGULAR DUCTWORK SHALL BE GALVANIZED SHEET METAL, INTERNALLY LINED WITH MINIMUM 1-1/2" THICK, 2 LB/CU.FT. DENSITY FIBERGLASS DUCT LINER, WITH MINIMUM NRC (NOISE REDUCTION COEFFICIENT) OF 0.70, MINIMUM INSULATION VALUE SHALL BE R-6. LINER SHALL BE U.L. APPROVED, MADE FROM FLAME ATTENUATED GLASS FIBER BONDED WITH A THERMOSETTING RESIN WITH ACRYLIC SMOOTH SURFACE TREATMENT AND FACTORY APPLIED EDGE COATING.
2. ALL DUCT DIMENSIONS ARE INSIDE CLEAR DIMENSIONS IN INCHES.
3. PROVIDE SPIN-IN FITTINGS WITH BUTTERFLY DAMPERS FOR ALL NEW ROUND SUPPLY RUN-OUTS TO DIFFUSERS AND ALL ROUND RETURN/EXHAUST RUN-OUT DUCTS TO RETURN/EXHAUST GRILLES. ANY DIFFUSERS OR GRILLES INSTALLED WHERE SAID BUTTERFLY DAMPERS WOULD BE INACCESSIBLE SHALL BE PROVIDED WITH INTEGRAL BALANCING DAMPER.
4. FABRICATE DUCTWORK OF GAUGES AND REINFORCEMENT COMPLYING WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS". MEDIUM PRESSURE DUCT, UPSTREAM OF VAV BOXES - PRESSURE CLASS 4" W.G. POSITIVE OR NEGATIVE, SEAL CLASS A. LOW PRESSURE DUCT, DOWNSTREAM OF VAV BOXES - PRESSURE CLASS 2" W.G. POSITIVE OR NEGATIVE, SEAL CLASS B.
5. USE MINIMUM 26 GA. WHERE DUCTS ARE WITHIN CORRIDORS.
6. SMACNA STANDARDS: COMPLY WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS, METAL AND FLEXIBLE" FOR FABRICATION AND INSTALLATION OF METAL DUCTWORK. COMPLY WITH SMACNA "HVAC AIR DUCT LEAKAGE TEST MANUAL" FOR TESTING OF DUCT SYSTEMS.
7. ALL RECTANGULAR DUCTWORK WITH 45 DEG. ELBOWS OR GREATER SHALL HAVE DOUBLE WALL TURNING VANES OR LONG RADIUS ELBOWS. PROVIDE LONG RADIUS ELBOWS FOR ROUND DUCTWORK.
8. FLEXIBLE AIR DUCTS SHALL BE LISTED UNDER U.L.-181 STANDARDS AS CLASS I AIR DUCT MATERIAL. MINIMUM OPERATING PRESSURE RATING SHALL BE 6" W.C. WITH MINIMUM WORKING VELOCITY RATING OF 4000 FPM.
9. ALL INSULATED FLEXIBLE DUCTS SHALL BE CONSTRUCTED OF A METALIZED RIPSTOP REINFORCED LAMINATE INNER CORE; MINIMUM 2" THICK, INSTALLED R-6, 3/4 LB./CU.FT. DENSITY FIBERGLASS INSULATION WITH "C" FACTOR OF 0.23 OR LESS; AND AN OUTER JACKET MADE EXCLUSIVELY OF FIRE RETARDANT REINFORCED ALUMINIZED MATERIAL. EQUAL TO FLEXMASTER TYPE 5M.
10. FINAL CONNECTION OF FLEXIBLE DUCTWORK TO RUN-OUT DUCTS AND CEILING DIFFUSERS SHALL BE MADE WITH 0.5" WIDE POSITIVE-LOCKING STEEL STRAPS.
11. MAXIMUM LENGTH: FOR ANY DUCT RUN USING FLEXIBLE DUCTWORK, SHALL NOT EXCEED 6'-0".
12. CONNECTIONS TO EXHAUST GRILLES SHALL BE MADE WITH RIGID DUCTWORK ONLY. PROVIDE OBD DAMPERS ON GRILLES MOUNTED ON HARD CEILINGS.
13. SEAL ALL DUCTWORK WITH NON-HARDENING, NON-MIGRATING MASTIC OR LIQUID ELASTIC SEALANT, OF TYPE APPLICABLE FOR FABRICATION/INSTALLATION DETAIL, AS COMPOUNDED AND RECOMMENDED BY MANUFACTURER, SPECIFICALLY FOR SEALING JOINTS AND SEAMS IN DUCTWORK.
14. DUCT TAKEOFF FITTINGS: PROVIDE SPIN-IN FITTINGS AT FLEXIBLE OR ROUND SHEET METAL DUCT TAKEOFFS TO AIR DEVICES. FITTINGS DOWNSTREAM OF AIR TERMINALS SHALL INCLUDE BUTTERFLY TYPE MANUAL VOLUME DAMPER WITH END BEARINGS, REGULATOR, AND LOCKING DEVICE.
15. PROVIDE DUCT HANGERS IN ACCORDANCE WITH SMACNA HVAC DUCT MANUALS.
16. KITCHEN GREASE EXHAUST DUCT SHALL BE MINIMUM 16 GA. CARBON STEEL, ALL WELDED CONSTRUCTION, WITH ACCESS PANELS AND CLEANOUTS FOR GREASE CLEANING, AS REQUIRED BY NFPA 96 AND 2018 IMC SECTIONS 506.3.8 AND 506.3.9. SLOPE DUCT BACK TOWARDS HOOD AT MINIMUM OF 1/4" PER LF MAINTAINING CODE REQUIRED CLEARANCE TO COMBUSTIBLE MATERIALS. INSTALL GREASE DUCT IN AN APPROVED 2 HOUR FIRE-RATED ENCLOSURE, AS REQUIRED BY CODE OR PROVIDE A 2 HOUR FIRE WRAP, U.L. LISTED FOR GREASE DUCT SYSTEM.
17. DISHWASHER, POOL AND LOCKER ROOM EXHAUST SHALL BE MINIMUM 16 GA. ALUMINUM. SLOPE DUCT DOWN TO AIR DEVICE.

M. FLUES:

1. TYPE B DOUBLE-WALL FLUE VENTS (U.L.-LISTED) SHALL BE PROVIDED FOR ALL GAS-FIRED EQUIPMENT WITH ATMOSPHERIC BURNERS. DOUBLE-WALL PRESSURIZED SYSTEMS SHALL BE PROVIDED FOR FORCED-DRAFT TYPE BURNERS.

N. COMBINATION FIRE/SMOKE DAMPERS:

1. PROVIDE AND INSTALL U.L. LABELED, CLASS II (FOR VELOCITIES UP TO 1,500 FPM) OR CLASS I (FOR VELOCITIES ABOVE 1500 FPM), MOTOR-DRIVEN COMBINATION FIRE/SMOKE DAMPERS AT ALL FIRE RATED WALLS, FULL DUCT SIZE, WITH TYPE 304 STAINLESS STEEL SIDE SEALS, COMBINATION SILICONE/GALVANIZED STEEL EDGE SEALS, BRONZE OILITE OR STAINLESS STEEL SLEEVE BEARINGS, AIRFOIL SHAPED GALVANIZED STEEL PARALLEL ACTING BLADES ALONG WITH OUT-OF-AIRSTREAM IN-JAMB LINKAGE WITH STAINLESS STEEL PIVOTS AND FACTORY SLEEVE, RED ENAMEL FINISH, CAULKED AND ATTACHED TO DAMPER IN ACCORDANCE WITH U.L. FIRE DAMPER REQUIREMENTS.
2. FIRE/SMOKE DAMPERS SHALL BE ACTIVATED PER 2018 IMC SECTION 607.3.3.2. ACTIVATION SHALL BE COORDINATED BY GENERAL CONTRACTOR.

O. AIR OUTLETS AND INLETS:

1. CEILING COMPATIBILITY: PROVIDE DIFFUSERS WITH BORDER STYLES THAT ARE COMPATIBLE WITH ADJACENT CEILING SYSTEMS, AND THAT ARE SPECIFICALLY MANUFACTURED TO FIT INTO CEILING MODULE WITH ACCURATE FIT AND ADEQUATE SUPPORT. REFER TO ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR TYPES OF CEILING SYSTEMS, WHICH WILL CONTAIN EACH TYPE OF CEILING AIR DIFFUSER.
2. ALL 24"X24" CEILING SUPPLY AIR DIFFUSERS SHALL BE 4-WAY THROW UNLESS OTHERWISE INDICATED ON DRAWINGS.

P. CONTROLS:

1. TEMPERATURE CONTROLS CONTRACTOR SHALL PROVIDE A COMPLETE NEW CONTROL SYSTEM WITH ALL DEVICES REQUIRED FOR THE MECHANICAL SYSTEMS TO OPERATE AS REQUIRED.
2. THE CONTROL CONTRACTOR WILL BE RESPONSIBLE FOR ALL INSTALLATION, PROGRAMMING, COMMISSIONING, TESTING AND PERFORMANCE VERIFICATION.
3. PROVIDE 120V WIRING AS REQUIRED FOR THE TEMPERATURE CONTROL SYSTEMS, UNLESS SPECIFICALLY INDICATED ON ELECTRICAL DRAWINGS.

Q. PIPING INSULATION:

1. PIPING SHALL BE INSULATED WITH FIBERGLASS PIPING INSULATION

FAN SCHEDULE

TAG	MANUFACTURER	MODEL	LOCATION	SYSTEM	FAN TYPE	MOUNT TYPE	CFM	E.S.P. (IN. W.C. @ ALT.)	FAN RPM	MOTOR HP	DAMPER TYPE	DRIVE TYPE	UNIT ELECTRICAL SERVICE VOLTS/PH/HZ	CONTROL	VIBRATION ISOLATION	OPERATIONAL WEIGHT (LBS)	SPECIFIC NOTES
BF-1	AO SMITH	ENT-50 ACCESSORY	WATER HEATERS	EWH VENTILATION	BOOSTER FAN	3	100	0.1	1750	0.25	NONE	DIRECT	120/1/60	2	NONE	20	
EF-1	PANASONIC	FV-0810VSS1	UNIT BATHROOM	BATHROOM EXHAUST	CEILING MOUNTED	2	80	0.25	1114	-	BACKDRAFT	DIRECT	120/1/60	1	NONE	40	
EF-2	PANASONIC	FV-0510VS1	UNIT LAUNDRY CLOSET	LAUNDRY EXHAUST	WALL MOUNTED	1	80	0.1	1070	-	BACKDRAFT	DIRECT	120/1/60	1	NONE	40	

GENERAL NOTES
1. ALL FANS UL LISTED.
2. PROVIDE DISCONNECT MEANS FOR SINGLE PHASE EQUIPMENT.

CONTROL
1. WALL SWITCH.
2. INTERLOCK WITH WATER HEATER.

MOUNT TYPE
1. WALL MOUNT IN DRYWALL.
2. CEILING MOUNT. PROVIDE UL LISTED RADIATION DAMPER COMPATIBLE WITH ASSEMBLY BEING PENETRATED AS REQUIRED.
3. INLINE DUCT MOUNTED, SUPPORT DUCTWORK/FAN PER MANUFACTURER REQUIREMENTS.

VERTICAL TERMINAL AIR CONDITIONER SCHEDULE (HEAT PUMP W/ ELEC. HEAT)

E	MANUFACTURER	MODEL	LOCATION	AIRFLOW CFM	EER (ARI)	COOLING RATING (BTUH)	ELECTRIC HEATING RATING (BTUH) @ 208V	ELECTRIC HEAT: HEATING CAPACITY (KW @ 208V)	EAT (°F)	LAT (°F)	HEATING STAGES	REFRIGERANT TYPE	UNIT ELECTRICAL SERVICE: VOLTS/PH/HZ	FLA	MCA	MOCP	OPERATIONAL WEIGHT (LBS)	SPECIFIC NOTES
VTAC-1	FIRST CO.	18SPXC-6-HP	RESIDENTIAL UNITS	610	11	16,800	15,400	4.5	65	93	1	R-410A	208/1/60	25	31	35	275	
VTAC-2	FIRST CO.	24SPXC-8-HP	RESIDENTIAL UNITS	780	11	22,200	20,500	6	65	94	1	R-410A	208/1/60	32	40	50	300	
VTAC-3	FIRST CO.	30SPXC-8-HP	RESIDENTIAL UNITS	825	11	27,600	20,500	6	65	93	1	R-410A	208/1/60	33	41	50	325	

GENERAL NOTES
1. PROVIDE RETURN AIR GRILLE, INSTALLATION PLATFORM (FIELD INSTALLED), WALL PLENUM, AND MERV 8 FILTER. RE-ARCH FOR EXTERIOR LOUVER.
2. PROVIDE OPTIONAL POWER SUPPLY KIT APPROPRIATE FOR UNIT, (PLUG IN CONNECTION).
3. PROVIDE REMOTE MOUNT DIGITAL, PROGRAMMABLE T-STAT WITH FAN ON/AUTO SWITCHING. THERMOSTATS SHALL BE APPROVED BY OWNER PRIOR TO PURCHASE.
4. PROVIDE INDOOR FROST CONTROL, AUTOMATIC COMPRESSOR RANDOM RESTART, REVERSE CYCLE HEAT PUMP DEFROST.
5. PROVIDE GALVANIZED CONDENSATE DRAIN PAN & FLOAT SWITCH WITH OVERFLOW SENSOR PER IMC. CONNECT CONDENSATE TO RISER AND ROUTE TO INDIRECT WASTE CONNECTION. PROVIDE WITH CONDENSATE PUMP AS NECESSARY.
6. SEAL VTAC TO OUTSIDE LOUVER AIRTIGHT.
7. FOLLOW MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION AND STARTUP OF NEW VTAC UNIT. MOUNT UNIT IN PROPER STRUCTURAL LOCATION, AND PROVIDE ALL REQUIRED SERVICE AND OPERATIONAL CLEARANCES. COORDINATE MOUNTING WITH STRUCTURE AS REQUIRED.
8. PROVIDE MOTORIZED DAMPER FOR OUTDOOR AIR INTAKE.

PRICING ALTERNATE:
FRIEDRICH MODEL VRP

CABINET/UNIT HEATER SCHEDULE (ELECTRIC)

TAG	MANUFACTURER	MODEL	TYPE	LOCATION	AREA SERVED	CONFIG.	CFM	ELECTRIC COIL: HEATING CAPACITY (KW)	EAT (°F)	LAT (°F)	HEATING STAGES	UNIT ELECTRICAL SERVICE: VOLTS/PH/HZ	FLA	MCA	MOCP	SPECIFIC NOTES
ECUH-5	MARKEL	6333D052033B30D0F	CABINET UNIT HEATER	STAIR	STAIR	SEE PLANS	250	5	50	126	2	208/3/60	13.8	17.6	20	
EH-1	RAYWALL	AFA115D	WALL MOUNT UNIT HEATER	WATER ENTRY	WATER ENTRY	RECESSED	175	1.5	40	73	1	120/1/60	12.5	12.5	20	

GENERAL NOTES:
1. UNIT MOUNTED THERMOSTAT.
2. BEIGE POWDER-COATED FINISH. COORDINATE FINISH WITH ARCH PRIOR TO ORDERING.
3. UNIT MOUNTED DISCONNECT.

GRILLE/REGISTER/DIFFUSER SCHEDULE

TAG	SYMBOL	MANUF.	MODEL	TYPE	USE	FRAME	MATERIAL	DAMPER TYPE	NECK SIZE	SPECIFIC NOTES
A		ACCORD	202	WALL/CEILING MOUNTED	UNIT SUPPLY	SEE PLANS	STEEL	O.B.D.	SEE PLANS	
B		ACCORD	500	WALL MOUNTED	UNIT RETURN	SEE PLANS	STEEL	NONE	SEE PLANS	
C		ACCORD	500	WALL MOUNTED	DRYER MAKEUP	SEE PLANS	STEEL	NONE	SEE PLANS	
F	CD	ACCORD	222	WALL MOUNTED	SUPPLY	6"X12"	STEEL	O.B.D.	SEE SCHEDULE	1
XD		XVENTBOX	DHEB-44-S	WALL MOUNTED	EXHAUST	SEE PLANS	WHITE PLASTIC	NONE	SEE PLANS	2
XS		XVENTBOX	SLIM-6-S	WALL MOUNTED	EXHAUST	SEE PLANS	WHITE PLASTIC	NONE	SEE PLANS	2

GENERAL NOTES
1. FINISH COLOR TO BE APPROVED BY ARCHITECT.
2. SURFACE MOUNTING FRAME FOR INSTALLATION IN GYPBOARD CEILING WHERE REQUIRED.
3. INSTALL BALANCING DAMPERS ABOVE ACCESSIBLE CEILING WHERE POSSIBLE. WHERE BALANCING DAMPERS CANNOT BE INSTALLED ABOVE CEILING, PROVIDE 9V RJ11 REMOTE CONTROLLED DAMPER ACTUATOR (GREENHECK RBDR-50 OR APPROVED EQUAL), WITH CONTROLLER MOUNTED SO AS TO BE OPERABLE FROM DIFFUSER FACE WHERE POSSIBLE.

SPECIFIC NOTES
1. INSTALL IN SOFFIT BELOW RATED CEILING ASSEMBLY TO AVOID RADIATION DAMPERS.
2. COORDINATE WITH ARCHITECT TO DETERMINE MODEL NUMBER COMPATIBLE WITH UL LISTING OF EXTERIOR WALL.

DIFFUSER NECK SIZE SCHEDULE

CFM RANGE	MINIMUM NECK SIZE
0 - 125	6"Ø
126 - 225	8"Ø
226 - 300	10"Ø
301 - 400	12"Ø
401 - 500	14"Ø

1. PROVIDE RIGID RUN-OUT DUCT OF SAME SIZE AS DIFFUSER NECK DIAMETER.
2. INCREASE RUN-OUT DUCT SIZE BY ONE FULL SIZE WHEN LENGTH OF RUN-OUT DUCT FROM MAIN SUPPLY DUCT EXCEEDS 20'-0". PROVIDE TRANSITION AT THE DIFFUSER.

PLOT DATE: 3/23/2022 8:12:32 AM

COPYRIGHT©

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, CO 80202
PH: 303.389.0095 | FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

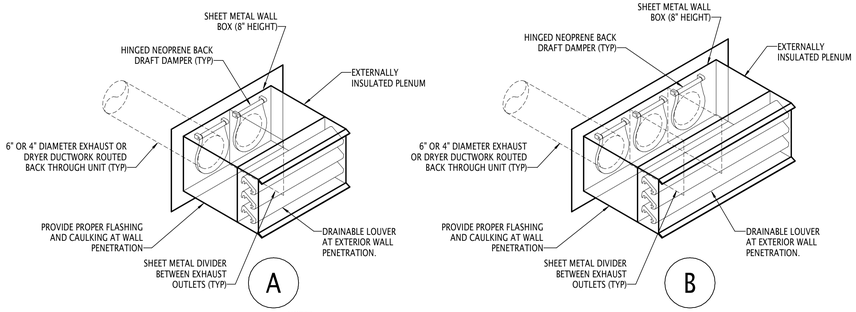
Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

MECHANICAL SCHEDULES

MG002

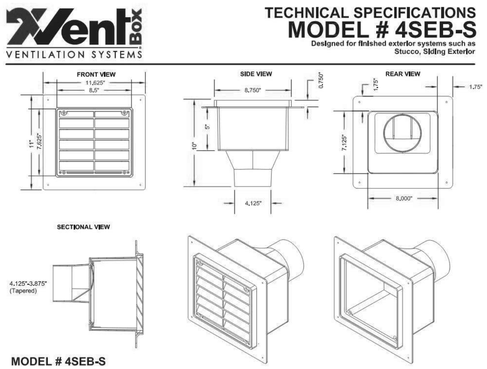


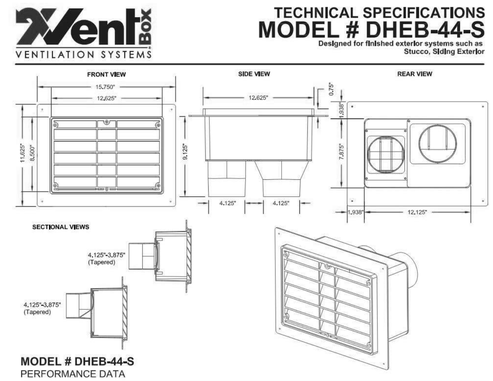
NOTES:

1. WIDTH AND ORIENTATION OF TERMINATION BOX VARIES BASED ON UNIT TYPE.
2. EXHAUST TERMINATION SHALL COMPLY WITH IMC 501.2 (MIN. 3'-0" FROM OPERABLE OPENINGS).

1 UNIT DRYER AND BATHROOM EXHAUST TERMINATION BOX DETAIL (FIELD FABRICATED OR XVENTBOX OPTION)

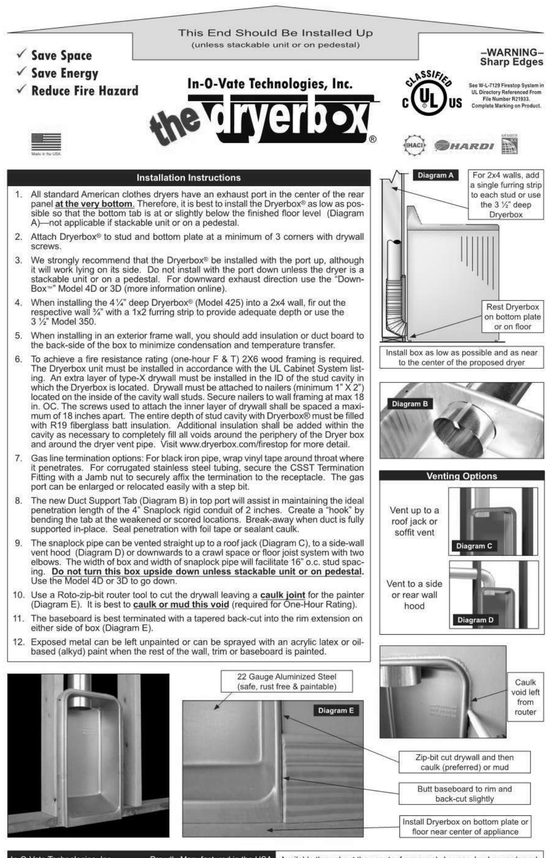
NO SCALE





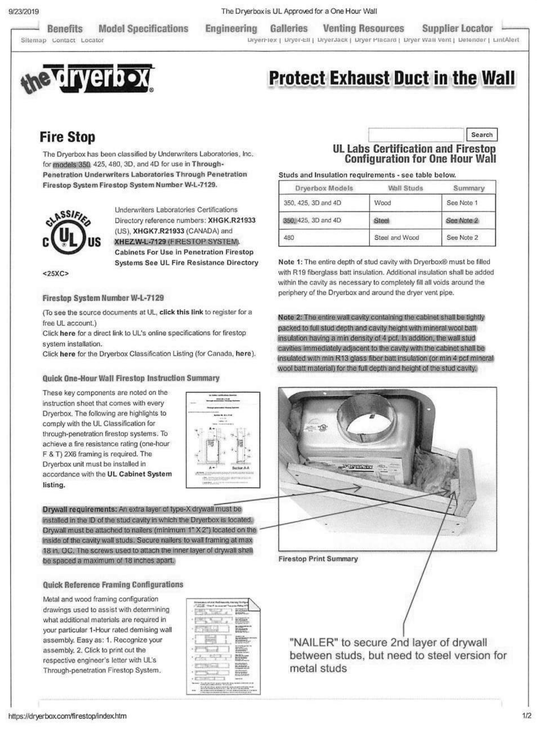
2 XVENT BOX DETAIL

NO SCALE



3 DRYER BOX DETAIL

NO SCALE



GUD27EESN GUD27GESN

GE® Unitized Spacemaker® 3.9 DOE Cu. Ft. Stainless Steel Washer and 5.9 Cu. Ft. Dryer

DIMENSIONS AND INSTALLATION INFORMATION (IN INCHES)

ELECTRICAL REQUIREMENTS:
GUD27EESN Electric Dryer – This appliance should be connected to an individual, properly-grounded branch circuit with 120/240V or 120/208V single-phase 60 Hz electrical service and should be protected by 30-amp time-delay fuses or circuit breakers KW Rating per voltage (240/208). This appliance is manufactured with neutral connected to the frame. Power cord should be purchased separately.

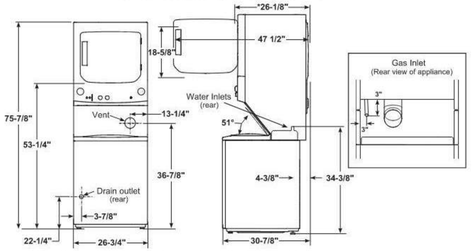
GAS REQUIREMENTS:
GUD27GESN Gas Dryer – This appliance should be connected to an individual branch circuit with 120-volt single-phase 60 Hz electrical service and should be protected by 20-amp time-day fuses or circuit breakers. This appliance is equipped with a 4-foot long flexible U.S. listed 20-amp power cord to match a 20-amp receptacle.

NOTE: Gas Rated input 20,000 BTU/HR. Factory equipped for natural gas. Tested for LP gas. LP gas supply requires a conversion kit. Have a qualified gas technician install a conversion kit before use.

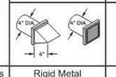
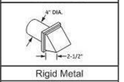
Dryers must be exhausted to the outside.

INSTALLATION INFORMATION: For complete information, see installation instructions packed with the product.

Installation Instructions
27" NOMINAL PRODUCT DIMENSIONS



** Dimension represents door closed including handle and knobs.*
***NOTE:** With feet set at mid position, feet can be adjusted +/- 3/8".*

EXHAUST LENGTH 27" LONG VENT MODELS	RECOMMENDED MAXIMUM LENGTH	
	Exhaust Hood Types	
	Recommended	Use only for short run installations
		
No. of 90° Elbows	Rigid Metal	Rigid Metal
0	200 Feet	175 Feet
1	185 Feet	165 Feet
2	175 Feet	155 Feet
3	165 Feet	145 Feet
4	155 Feet	135 Feet
5	145 Feet	125 Feet

GE APPLIANCES

For answers to your GE Profile™ Series or GE Appliances product questions, visit our website at geappliances.com or call GE Answer Center® Service, 800.626.2000.

Listed by Underwriters Laboratories

As an ENERGY STAR® partner, GE has determined that this product meets the ENERGY STAR guidelines for energy efficiency.

Specification Revised 4/10

NOTE: CURRENT DRYER SPEC SHOWN FOR REFERENCE ONLY. PENDING DRYER SPEC FROM ARCHITECT.

4 LONG VENT DRYER DETAIL

NO SCALE

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, COLORADO 80202
PH: 303.389.0095 | FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

MECHANICAL DETAILS

MG003

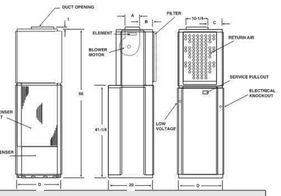
PLOT DATE: 3/23/2022 8:12:33 AM

COPYRIGHT©

SPXC-HP Series

Heat Pump

In keeping with its policy of continuous progress and product improvement, First Co. reserves the right to make changes without notice. Maintenance for all First Co. products is available under "Product Maintenance" at www.firstco.com.



	A	B	C	D	FILTER
9,12,18SPXC-HP	6-1/2	6-1/8	6-5/8	20	18 x 24 x 1
24,30SPXC-HP	10	2-1/2	8	26	24 x 24 x 1

ELECTRICAL DATA (208/230V-1PH-60Hz)

UNIT MODEL		ELECTRIC HEAT DATA kW 240V	kW 208V	BTUH 240V	BTUH 208V	TOTAL HEATING AMPS 240V	TOTAL HEATING AMPS 208V	BLOWER DATA EVAPORATOR MOTOR AMPS	BLOWER DATA EVAPORATOR MOTOR HP	CONDENSER DATA COMPRESSOR RLA	CONDENSER DATA COMPRESSOR LRA	CONDENSER DATA CONDENSER MOTOR FLA	CONDENSER DATA CONDENSER MOTOR HP	MINIMUM CIRCUIT AMPACITY 208V	MINIMUM CIRCUIT AMPACITY 240V	MAXIMUM CIRCUIT PROTECTION 208V	MAXIMUM CIRCUIT PROTECTION 240V	SHIP WT.
9SPXC	-2 -3 -4	2 3 4	1.5 2.25 3	6800 10200 13600	5100 7700 10200	10.6 14.8 19.0	9.5 13.1 16.7	2.3	1/4	4.4	25	2.3	1/4	12 16 21	13 18 23	15 20 25	15 20 25	245
12SPXC	-2 -3 -4 -5	2 3 4 4.5	1.5 2.25 3 3.38	6800 10200 13600 15400	5100 7700 10200 11500	10.6 14.8 19.0 21.1	9.5 13.1 16.7 18.6	2.3	1/4	4.7	25	2.3	1/4	12 16 21 23	13 18 23 26	15 20 25 25	15 20 25 30	245
18SPXC	-2 -3 -4 -5 -6 -8 -10	2 3 4 4.5 6 8 9	1.5 2.25 3 3.38 4.5 6.0 6.75	6800 10200 13600 15400 20500 27300 30700	5100 7700 10200 11500 15400 20500 23000	11.1 15.3 19.5 21.6 27.8 36.1 40.3	10.0 13.6 17.2 19.1 24.4 31.6 35.3	2.8	1/3	9.0	56.3	2.3	1/4	16 17 22 24 31 40 44	16 18 24 26 33 44 50	25 25 25 25 30 40 45	25 25 25 30 35 45 50	255
24SPXC	-3 -4 -5 -6 -8 -10	3 4 4.5 5 8 9	2.25 3 3.38 3.75 6.0 6.75	10200 13600 15400 17000 27300 30700	7700 10200 11500 12800 20500 23000	15.3 19.5 21.6 23.8 36.1 40.3	13.6 17.2 19.1 21.1 31.6 35.3	2.8	1/3	10.9	62.9	2.3	1/4	19 22 24 26 40 44	19 25 26 28 33 50	25 25 30 30 45 50	25 25 30 35 45 50	295
30SPXC	-3 -4 -5 -6 -8 -10	3 4 4.5 5 6 8 9	2.25 3 3.38 3.75 4.5 6.0 6.75	10200 13600 15400 17000 20500 27300 30700	7700 10200 11500 12800 15400 20500 23000	16.6 20.8 22.9 25.1 29.1 37.4 41.6	14.9 18.5 20.4 25.7 32.9 36.6	4.1	1/2	12.8	67.8	1.9	1/3	22 23 26 32 41 46	22 25 28 35 46 51	30 30 30 35 40 50	30 30 30 40 50 50	300

VTAC-1 → 18SPXC
VTAC-2 → 24SPXC
VTAC-3 → 30SPXC

NOTE:
Compressors in these models do not operate simultaneously with heater elements.

BLOWER DATA

UNIT MODEL	MOTOR SPEED CONN. (1)	CFM vs EXTERNAL STATIC PRESSURE 0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40
9SPXC-HP	HIGH	490	475	465	455	450	440	430	425
	MED (H & C)	390	380	370	360	350	340	330	325
	LOW	320	310	300	290	280	270	260	250
12SPXC-HP	HIGH	500	485	475	465	460	450	445	440
	MED (H & C)	430	420	410	400	390	385	375	370
	LOW	350	340	330	320	310	305	295	285
18SPXC-HP	TAP 3	705	695	685	675	670	660	650	635
	TAP 2(C)	655	645	635	620	610	600	590	580
	TAP 1(H)	595	580	560	540	530	515	505	490
24SPXC-HP	TAP 3	900	890	880	870	860	855	845	835
	TAP 2(C)	820	810	800	790	780	770	760	750
	TAP 1(H)	720	710	700	690	680	670	660	650
30SPXC-HP	TAP 3	910	900	895	890	885	880	875	870
	TAP 2(C)	845	840	835	830	825	820	815	810
	TAP 1(H)	740	730	720	715	710	710	700	690

(1) Factory Settings:
(H) = Heating, (C) = Cooling

⚠ WARNING / AVERTISSEMENT / ADVERTENCIA
Risk of Electrical Shock or Equipment Damage.
Cancel all Trouble(s) per Equipment Manufacturer
Cancelar el Trouble(s) por Equipo del Fabricante
www.ThinkHomeLink.com

COOLING / PERFORMANCE DATA

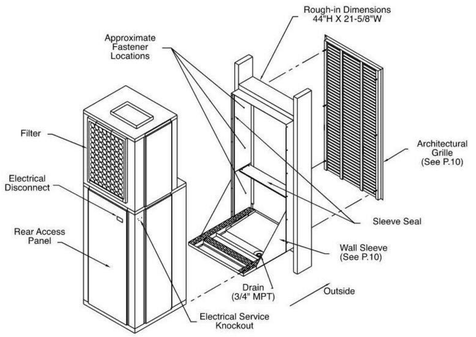
UNIT MODEL	STANDARD RATING (1) BTUH	EER
9SPXC-HP	9100	11.0
12SPXC-HP	11200	11.0
18SPXC-HP	16800	11.0
24SPXC-HP	22200	11.0
30SPXC-HP	27600	11.0

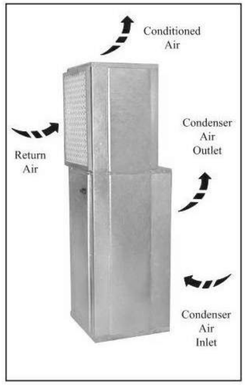
(1) 95°F DB/75°F WB outdoor - 80°F DB/67°F WB indoor.
(2) Tested in accordance with AHRI Standard 390.

HEATING / PERFORMANCE DATA (3)

UNIT MODEL	STANDARD RATING (1) BTUH	COP (47°)
9SPXC-HP	8800	3.5
12SPXC-HP	10700	3.3
18SPXC-HP	15700	3.5
24SPXC-HP	20800	3.5
30SPXC-HP	25200	3.3

(1) 47°F DB/43°F WB outdoor,
70°F DB/60°F WB indoor.





SHOWN WITH OPTIONAL LOUVERED ACCESS PANEL

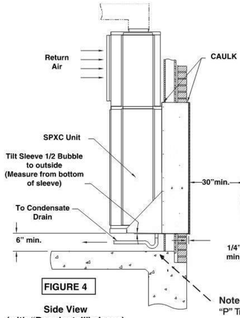


FIGURE 4

Side View (with "Rear Install" sleeve)

FIGURE 5

Side Install Sleeve

Note:
Separate wall mounting bracket is shipped with "side install" wall sleeves.

Note:
"P" Trap is shown for illustration purposes only - It may not be required by local codes.

UNIT / SLEEVE DIMENSIONS

Part Number					
Rear Install	Side Install	Fits Wall Thickness	A	B	C
9"-1B	9"-11B	5" - 8" wall	9"	17-1/2"	26"
9"-2B	9"-12B	8" - 12" wall	13"	17-1/2"	30"
9"-3B	9"-13B	12" - 15" wall	16"	17-1/2"	33"
9"-4B	9"-14B	15" - 20" wall	21"	17-1/2"	38"

** = wall sleeve regular, large and large with block off see page 10

(Unit shown with "Rear Install" sleeve)

FIGURE 6

"Standard Rear Install" sleeve shown

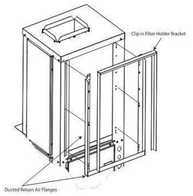
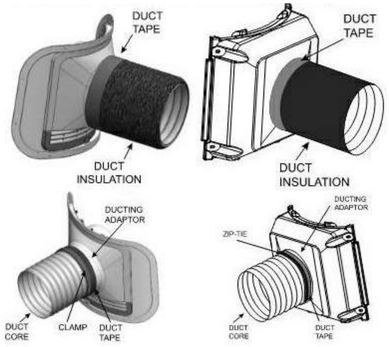


FIGURE 7

Filter Bracket Detail

1 VTAC HEAT PUMP DETAIL
NO SCALE



DUAL DUCT INSTALLATIONS STRAIGHT

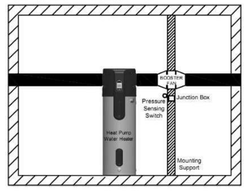


Figure 12.

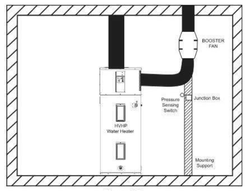


Figure 15.

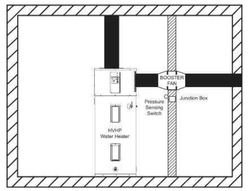


Figure 13.

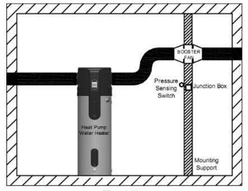


Figure 16.

DUAL DUCT INSTALLATIONS ELBOWED / 90° TURNS

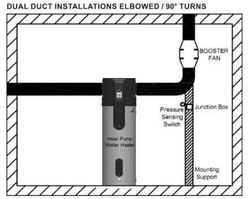


Figure 14.

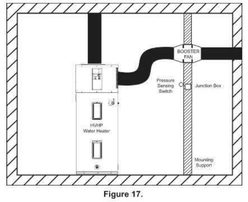


Figure 17.

2 HEWH BOOSTER FAN DETAIL
NO SCALE

WhisperValue DC VENTILATION FAN

FV-0810VSS1

Specification Submittal Data / Panasonic Ventilation Fan

Description:
Ventilating fan shall be Low Noise ceiling or wall mount type rated for continuous run. Fan shall be ENERGY STAR® rated and certified by the Home Ventilation Institute (HVI). Evaluated by Underwriters Laboratories and conform to both UL and cUL safety standards.

Motor/Blower:
- Enclosed brushless ECM motor technology rated for continuous run.
- Fan ventilation rates shall be manually adjustable for 80 or 100 CFM.
- Power rating shall be 120 volts and 60 Hz.
- Fan shall be UL and cUL listed for tub/shower enclosure when GFCI protected and used in insulated ceiling (TYPE I.C.).
- PCB board equipped with thermal–cutoff fuse.
- Removable with permanently lubricated plug-in motor.

Housing:
- 26 gauge galvanized steel body.
- Built-in 4" Oval duct collar. Also compatible with 4" round duct.
- Optional 24 gauge steel, fire code rated 4" oval to 3" round duct adaptor sold separately (Model # FV-VS43R).
- Built in backdraft damper.
- Built-in metal flange provides blocking for penetrations through drywall as an Air Barrier, and assists with the decrease in leakage in the Building Envelope during blower door testing.
- Unique L-shaped bracket simplifies installation and provides strong support.

Ceiling Radiation Damper:
- WhisperValue DC is UL listed for use with the Panasonic Ceiling Radiation Damper (Model #: PC-RD05C5, sold separately).

Grille:
- Attractive design using Poly Pro material.
- Attaches directly to housing with torsion springs.

Warranty:
- ECM Motor: 6 Years from original purchase date.
- ALL Parts: 3 Years from original purchase date.

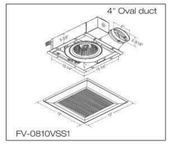
Architectural Specifications:
Ventilation fan shall be UL and cUL listed for ceiling or wall mount and tub/shower enclosure when GFCI protected. Fan shall also be ENERGY STAR® certified with multispeed control (0, 30-70 CFM, in 10 CFM increments) that shall be built-in and activated by a wall switch. Fan shall also incorporate a built-in speed selector. Choose from 50 or 100 CFM and no more than 0.4/0.9 sone as certified by the Home Ventilating Institute (HVI) at 0.1 static pressure in inches water gauge (w.g.) with no less than 81/101 CFM and no more than 0.8/1.3 sone as certified by HVI at 0.25 w.g., and no less than 75/83 CFM at 0.375 w.g. Power Consumption shall be no greater than 8.5/12.4 watts at 0.1 w.g. and 13.2/18.0 watts at 0.25 w.g., and 16.0/18.0 watts at 0.375 w.g. with efficiency of no less than 10.0/8.2 CFM/watt at 0.1 w.g. and 6.5/5.7 CFM/watt at 0.25 w.g., and 4.7/4.6 CFM/watt at 0.375 w.g. The motor shall be totally enclosed with a brushless ECM motor engineered to run continuously. ECM motor speed shall automatically increase when the fan senses static pressure to maintain selected CFM. Power rating shall be 120V/60Hz. Duct diameter shall be no less than 4". Optional 24 gauge steel, fire code rated 4" oval to 3" round duct adaptor sold separately (Model FV-VS43R). Fan can be used to comply with ASHRAE 62.2, LEED, EarthCraft, California Title-24 and WA Ventilation Code.

For complete Installation Instructions visit **us.panasonic.com/ventfans**

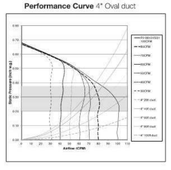
Model	Quantity	Comments	Project:
			Location:
			Architect:
			Engineer:
			Contractor:
			Submitted by:
			Date:

Panasonic

FV-0810VSS1



Performance Curve 4" Oval duct



Specifications and Additional Features on following page.

3 BATHROOM EXHAUST FAN (EF-1) DETAIL
NO SCALE

WhisperValue DC VENTILATION FAN

FV-0510VS1

Specification Submittal Data / Panasonic Ventilation Fan

Description:
Ventilating fan shall be Low Noise ceiling or wall mount type rated for continuous run. Fan shall be ENERGY STAR® rated and certified by the Home Ventilation Institute (HVI). Evaluated by Underwriters Laboratories and conform to both UL and cUL safety standards.

Motor/Blower:
- Enclosed brushless ECM motor technology rated for continuous run.
- Fan ventilation rates shall be manually adjustable for 50-80-100 CFM.
- Power rating shall be 120 volts and 60 Hz.
- Fan shall be UL and cUL listed for tub/shower enclosure when GFCI protected and used in insulated ceiling (TYPE I.C.).
- PCB board equipped with thermal–cutoff fuse.
- Removable with permanently lubricated plug-in motor.

Housing:
- 26 gauge galvanized steel body.
- Built-in 4" Oval duct collar. Also compatible with 4" round duct.
- Optional 24 gauge steel, fire code rated 4" oval to 3" round duct adaptor sold separately (Model # FV-VS43R).
- Built in backdraft damper.
- Built-in metal flange provides blocking for penetrations through drywall as an Air Barrier, and assists with the decrease in leakage in the Building Envelope during blower door testing.
- Unique L-shaped bracket simplifies installation and provides strong support.

Ceiling Radiation Damper:
- WhisperValue DC is UL listed for use with the Panasonic Ceiling Radiation Damper (Model #: PC-RD05C5, sold separately).

Grille:
- Attractive design using Poly Pro material.
- Attaches directly to housing with torsion springs.

Warranty:
- ECM Motor: 6 Years from original purchase date.
- ALL Parts: 3 Years from original purchase date.

Architectural Specifications:
Ventilation fan shall be UL and cUL listed for ceiling or wall mount and tub/shower enclosure when GFCI protected. Fan shall also be ENERGY STAR® certified, with a built-in speed selector. Choose from 50-80-100 CFM and no more than <0.3/0.4/0.9 sone as certified by the Home Ventilating Institute (HVI) at 0.1 static pressure in inches water gauge (w.g.) with no less than 53/81/100 CFM and no more than 0.5/0.8/1.3 sone as certified by HVI at 0.25 w.g., and 52/75/83 at 0.375 w.g. Power Consumption shall be no greater than 4.4/7.2/11.1 watts at 0.1 w.g. and 7.5/11.5/16.0 watts at 0.25 w.g., and at 0.375 w.g. 12.0/16.0/18.0 watts, with efficiency of no less than 12.8/11.4/9.2 CFM/watt at 0.1 w.g. and 7.9/7.2/6.4 CFM/watt at 0.25 w.g., and 4.3/4.7/4.6 CFM/watt at 0.375" w.g. The motor shall be totally enclosed with a brushless ECM motor engineered to run continuously. ECM motor speed shall automatically increase when the fan senses static pressure to maintain selected CFM. Power rating shall be

Specifications: **WhisperValueDC** FV-0510VS1		4" Oval		4" Oval		4" Oval	
	Static Pressure in inches w.g.	0.1	0.25	0.375	0.1	0.25	0.375	0.1	0.25	0.375
Ventilation Fan Characteristics (HVI Certified Data)	Air Volume (CFM)	100	100	83	80	81	75	50	53	52
	Noise (sones)	0.9	1.3	-	0.4	0.8	-	<0.3	0.5	-
	Power Consumption (watts)	11.1	16.0	18.0	7.2	11.5	16.0	4.4	7.5	12.0
	Energy Efficiency (CFM/Watt)	9.2	6.4	4.6	11.4	7.2	4.7	12.8	7.9	4.3
	Speed (RPM)	902	1121	1300	797	1013	1219	708	1025	1230
	Current (amps)	0.20	0.27	0.25	0.13	0.20	0.24	0.09	0.14	0.17
	MAX. Current (amps)	0.39								
	Power Rating (V/Hz)	120/60								
	ENERGY STAR rated	Yes								

***Industry research indicates static pressure in typical installations ranges from 0.20" to 0.375"**

For complete Installation Instructions visit **us.panasonic.com/ventfans**

Model	Quantity	Comments	Project:
			Location:
			Architect:
			Engineer:
			Contractor:
			Submitted by:
			Date:

Panasonic Life Solutions Company of America
IAQ Division
Two Riverfront Plaza
Newark, NJ 07102

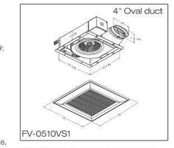
us.panasonic.com/ventfans

IAQ1916ZST

ECM Motor Technology
When the fan senses static pressure, its speed is automatically increased to ensure that the desired CFM is not compromised, which allows the fan to perform as rated.

Panasonic

FV-0510VS1



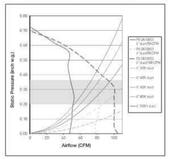
120V/60Hz. Duct diameter shall be no less than 4". Optional 24 gauge steel, fire code rated 4" oval to 3" round duct adaptor sold separately (Model # FV-VS43R). Fan can be used to comply with ASHRAE 62.2, LEED, EarthCraft, California Title-24 and WA Ventilation Code.

WhisperValue Contractor Pack*
The Contractor Pack includes four complete fans. The housing and motor/grille are packaged separately for flexibility during installation.

Housing Can	Motor/Grille Assembly	Complete Fan Unit	Master Pack
FV-0510VS1A	FV-0510VSB1	FV-0510VS1	4

*Must order in quantities of 4. Shipment will contain 1 box with 4 units.

Performance Curve 4" Oval duct



4 KITCHEN/LAUNDRY CLOSET EXHAUST FAN (EF-2,3) DETAIL
NO SCALE

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, CO 80202
Ph: 303.389.0095 / FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

MECHANICAL DETAILS

MG004

PLOT DATE: 3/23/2022 8:12:35 AM

COPYRIGHT©

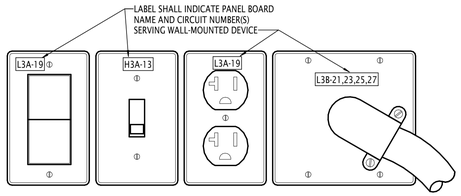
ELECTRICAL SHEET INDEX

MODEL INFORMATION:
2022.03.25 BID SET
BASED ON BACKGROUNDS:
2021.10.26 - ARCHITECTURAL
- STRUCTURAL
- CAD BACKGROUNDS

SHEET NUMBER	SHEET TITLE	03.25.2022 BID SET
EG000	ELECTRICAL LEGEND AND SHEET INDEX	x
EG001	ELECTRICAL GENERAL NOTES	x
EG002	ELECTRICAL ONE-LINE DIAGRAM	x
EG003	ELECTRICAL SCHEDULES	x
EG004	ELECTRICAL SCHEDULES	x
EG005	FEEDERS BRANCH CIRCUITS SCHEDULE	x
EG101	ELECTRICAL SITE PLAN	x
EG401	ENLARGED TYPICAL UNIT ELECTRICAL PLANS	x
EG402	ENLARGED TYPICAL UNIT ELECTRICAL PLANS	x
EG403	ENLARGED TYPICAL UNIT ELECTRICAL PLANS	x
EE101	EAST LIGHTING PLANS	x
EE102	EAST POWER PLANS	x
EE103	EAST ROOF POWER PLAN	x
EW101	WEST LIGHTING PLANS	x
EW102	WEST POWER PLANS	x
EW103	WEST ROOF POWER PLAN	x

PROJECT DESIGN CODES

YEAR	CODE
2018	INTERNATIONAL BUILDING CODE (IBC)
2018	INTERNATIONAL ENERGY CONSERVATION CODE (IECC)
2018	INTERNATIONAL MECHANICAL CODE (IMC)
2018	INTERNATIONAL PLUMBING CODE (IPC)
2018	INTERNATIONAL FIRE CODE (IFC)
2020	NATIONAL ELECTRIC CODE (NEC)



1 TYPICAL COVER PLATE CIRCUIT(S) LABELING DETAIL

NO SCALE

NOTE: THIS DETAIL REPRESENTS A TYPICAL LABELING REQUIREMENT. COORDINATE WITH THE CLIENT THE EXACT LABELING REQUIREMENTS FOR PUBLIC AREAS AND RESIDENTIAL UNITS AND IF THE CLIENT WOULD PREFER TO MARK THE BRANCH CIRCUITS ON THE INSIDE SIDE OF THE WALLPLATE.

ELECTRICAL LEGEND

NOT ALL SYMBOLS SHOWN ARE NECESSARILY USED ON THESE DRAWINGS

GENERAL

SYMBOL	DESCRIPTION
	ELECTRICAL DETAIL NOTE TAG
	FEEDER TAG
	RELOCATE EQUIPMENT, DEVICE ARROW
	HEAVY LINEWEIGHT ITEMS INDICATE NEW WORK TO BE DONE
	LIGHT LINEWEIGHT ITEMS INDICATE EXISTING TO REMAIN
	DASHED LINEWEIGHT ITEMS INDICATE EXISTING TO BE REMOVED
	NEW OR RELOCATED CIRCUIT RUN
	CIRCUIT RUN, EXISTING TO REMAIN
	CIRCUIT RUN, EXISTING TO BE REMOVED
UF	UNDER FLOOR CIRCUIT RUN
UC	UNDERGROUND CIRCUIT RUN
	CONDUIT CAP
	HOMERUN TO PANEL. NUMBER OF ARROWS INDICATES NUMBER OF CIRCUITS

SWITCHING

SYMBOL	DESCRIPTION
S Sa	SNAP SWITCH . SUBSCRIPT LETTER, IF SHOWN, INDICATES CONTROL OF FIXTURES MARKED WITH SAME SUBSCRIPT LETTER
S2	TWO-POLE SWITCH
S3	THREE-WAY SWITCH
S4	FOUR-WAY SWITCH
SD	DIMMER SWITCH
SK	KEY SWITCH
SS	GANGED SWITCHES
SLV	LOW VOLTAGE SWITCH
SRL	RAISE/LOWER WALL SWITCH
SP	SWITCH WITH PILOT LIGHT ("ON" WHEN THE SWITCH IS "OFF")
WALL CEILING	
W M	OCCUPANCY SENSOR

ABBREVIATIONS

ABBR.	DESCRIPTION
AC	ABOVE COUNTERTOP
AFCI	ARC-FAULT CIRCUIT INTERRUPTER
AFF	ABOVE FINISHED FLOOR
BC	BLANK COVER
(E), E	EXISTING
EPO	EMERGENCY POWER OFF
GFI, GFCI	GROUND FAULT PROTECTION FOR PERSONNEL
GFPE	GROUND FAULT PROTECTION OF EQUIPMENT
HP	HORSEPOWER
(N), N	NEW
NEC	NATIONAL ELECTRICAL CODE
NIC	NOT IN CONTRACT
(R), R	RELOCATED
(TYP)	TYPICAL
UF	UNDER FLOOR
UG	UNDER GROUND
WP	WEATHERPROOF (NEMA 3R RATING)

ADA DEVICES

SYMBOL	DESCRIPTION
DS	DOOR SIGNAL PUSH BUTTON AND BELL
DDS	DOOR SIGNAL DISCONNECT SWITCH
V	HEARING IMPAIRED VISUAL DEVICE TIED TO THE DOOR SIGNAL AND PHONE
T T	DOOR SIGNAL LOW VOLTAGE TRANSFORMER

LIGHTING

SYMBOL	DESCRIPTION
	SHADING INDICATES CONNECTION TO EMERGENCY CIRCUIT OR 90-MINUTES SELF-CONTAINED BATTERY PACK
	DIRECT/INDIRECT OR LENSED HIGH EFFICIENCY LIGHT FIXTURE
	RECESSED 2'x4' AND 2'x2' LIGHT FIXTURE
	RECESSED 1'x4' LIGHT FIXTURE
	SURFACE MOUNTED 1'x4' LIGHT FIXTURE
	STRIP LIGHT FIXTURE
	SUSPENDED LINEAR LIGHT FIXTURE
	DOWNLIGHT
	DIRECTIONAL WALL WASHER/ ADJUSTABLE DOWNLIGHT
	WALL SCONCE
	TRACK LIGHT
WALL CEILING	
	EXIT SIGN WITH FACING AND DIRECTIONAL ARROWS
	EMERGENCY LIGHT UNIT
	REMOTE EMERGENCY LIGHT HEAD

ONE-LINE

SYMBOL	DESCRIPTION
#	FAULT CURRENT POINT VALUE REFERENCE
	GROUNDING CONNECTION
	SERVICE WEATHERHEAD
	METER
SPD	SURGE PROTECTION DEVICE
G	GENERATOR
T	TRANSFORMER
T	PAD-MOUNTED TRANSFORMER
	ELECTRICAL PANEL
	AUTOMATIC TRANSFER SWITCH
	CIRCUIT BREAKER
	FUSED DISCONNECT SWITCH

COMMUNICATION

SYMBOL	DESCRIPTION
WALL CEILING FLOOR	
	COMBINATION PHONE/DATA OUTLET
	DATA OUTLET
	TELEPHONE OUTLET
	TELEPHONE BOARD
	GROUND BAR
TV	TV OUTLET

SECURITY

SYMBOL	DESCRIPTION
CR	CARD READER
	SECURITY CAMERA

POWER

SYMBOL	DESCRIPTION
WALL CEILING FLOOR	
	DUPLEX RECEPTACLE
	FOURPLEX RECEPTACLE
	SPECIAL PURPOSE OUTLET
	JUNCTION BOX
	DEDICATED, 20A RECEPTACLE: WALL DUPLEX
	DEDICATED, 20A RECEPTACLE: WALL FOURPLEX
	CORE DRILL
	CORE DRILL WITH FIRE RATED FLOOR POKE-THRU AND DEVICES AS INDICATED
	ABANDONED CORE DRILL WITH FIRE RATED PLUG AND APPROPRIATE FLUSH ABANDONMENT KIT
	POWER POLE
W	SURFACE MOUNTED MULTI OUTLET ASSEMBLY (WIREMOLD)
SURFACE RECESSED	
	NEW ELECTRICAL PANEL
	EXISTING ELECTRICAL PANEL
C P	WALL MOUNTED JUNCTION BOXES P=POWER C=COMMUNICATION/DATA
	SINGLE PUSH BUTTON
	EMERGENCY POWER OFF BUTTON (EPO)
	NON-FUSED DISCONNECT SWITCH
	FUSED DISCONNECT SWITCH
	STARTER
	DISCONNECT WITH STARTER
M	MOTOR
M	MOTORIZED DAMPER
GFI	BLANK FACE FEED-THROUGH 20A GROUND FAULT CIRCUIT INTERRUPTER
VFD	VARIABLE FREQUENCY DRIVE
T	120V LINE VOLTAGE THERMOSTAT

FIRE ALARM

SYMBOL	DESCRIPTION
WALL CEILING	
	SMOKE DETECTOR
CO CO	COMBINATION SMOKE/CARBON MONOXIDE (CO) DETECTOR
	THERMAL DETECTOR
	DUCT DETECTOR
	MOTORIZED SMOKE DAMPER
	MANUAL PULL STATION
	FIREMAN'S PHONE JACK
H	FIRE ALARM HORN
H	FIRE ALARM HORN AND STROBE
WALL CEILING	
	FIRE ALARM STROBE
S	FIRE ALARM SPEAKER
S	FIRE ALARM SPEAKER WITH STROBE
	FIRE ALARM BELL
	MAGNETIC DOOR HOLD-OPEN
FACP	FIRE ALARM CONTROL PANEL
ANN	FIRE ALARM ANNUNCIATOR PANEL
MS	MAIN FLOW SWITCH
FS	FLOW SWITCH
TS	TAMPER SWITCH

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, COLORADO 80202
Ph: 303.389.0095 | FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

ELECTRICAL LEGEND AND SHEET INDEX

EG000

PLOT DATE: 3/23/2022 8:19:58 AM

COPYRIGHT©

ELECTRICAL GENERAL NOTES

CONTRACTOR SHALL COMPLY WITH NOTES AS APPLICABLE TO PROJECT. NOTES ON INDIVIDUAL DRAWING TAKE PRECENDENCE.

1. BEFORE SUBMITTING THE BID ELECTRICAL CONTRACTOR SHALL VISIT AND EXAMINE THE PREMISES, AND/OR JOB SITE, SO AS TO ASCERTAIN THE EXISTING CONDITIONS IN WHICH HE WILL BE OBLIGED TO OPERATE IN PERFORMING HIS PART OF THE CONTRACT TO ANTICIPATE ANY POSSIBLE SPACE RESTRICTIONS OR CONSTRAINTS THAT COULD AFFECT TIMELY COMPLETION OF THE ELECTRICAL WORK IN ACCORDANCE WITH THE INTENT OF THE SPECIFICATIONS AND DRAWINGS. THE ELECTRICAL CONTRACTOR SHALL REPORT TO THE ARCHITECT OR GENERAL CONTRACTOR ANY CONDITIONS THAT MIGHT PREVENT THE SPECIFIED ELECTRICAL WORK FROM BEING PERFORMED IN THE MANNER INTENDED. NO CONSIDERATION OR ALLOWANCE WILL BE GRANTED TO THE ELECTRICAL CONTRACTOR FOR FAILURE TO VISIT THE PROJECT SITE, OR FOR ANY ALLEGED MISUNDERSTANDING OF THE MATERIALS TO BE FURNISHED OR WORK TO BE DONE.

2. THE ELECTRICAL CONTRACTOR SHALL EXAMINE THE DRAWINGS OF ALL TRADES WHOSE WORK RELATES TO OR IS DEPENDENT ON ELECTRICAL WORK TO BECOME FULLY INFORMED OF THE EXTENT AND CHARACTER OF THEIR SPECIFIED WORK AND BE ABLE TO COORDINATE IT WHILE AVOIDING POSSIBLE INTERFERENCE WITH THE ELECTRICAL WORK.

3. IT IS THE INTENT OF THIS SPECIFICATION THAT ONE GENERAL CONTRACTOR ENTERS INTO AN AGREEMENT WITH THE OWNER. THE USE AND COORDINATION OF SUBCONTRACTORS IS AT THE OPTION OF THE GENERAL CONTRACTOR. ALL EQUIPMENT, INCLUDING MECHANICAL, MOTORS AND CONTROLS SHALL BE FURNISHED, SET IN PLACE, AND WIRED. THE EXACT FURNISHING AND INSTALLATION OF THE EQUIPMENT SHALL BE COORDINATED BY THE CONTRACTORS INVOLVED.

4. IT IS THE INTENTION OF THESE SPECIFICATIONS AND DRAWINGS TO CALL FOR FINISHED WORK, TESTED AND READY FOR OPERATION. WHEREVER THE WORD "PROVIDE" IS USED, IT SHALL MEAN, "FURNISH AND INSTALL COMPLETE AND READY FOR USE."

5. THE ARCHITECTURAL SPECIFICATIONS, GENERAL AND SPECIAL CONDITIONS FOR THE WORK OF THIS PROJECT SHALL BE EXAMINED BY ELECTRICAL CONTRACTOR BEFORE SUBMITTING A BID.

6. WITH SUBMISSION OF THE BID, THE ELECTRICAL CONTRACTOR SHALL GIVE WRITTEN NOTICE TO THE ARCHITECT/ENGINEER OF ANY NECESSARY ITEMS OR WORK THAT HAVE BEEN OMITTED FROM THE DRAWINGS OR SPECIFICATIONS. IN THE ABSENCE OF SUCH WRITTEN NOTICE IT IS MUTUALLY AGREED THAT THE ELECTRICAL CONTRACTOR HAS INCLUDED THE COST OF ALL REQUIRED ITEMS IN HIS BID, AND THAT THE ELECTRICAL CONTRACTOR WILL BE RESPONSIBLE FOR THE APPROVED SATISFACTORY FUNCTIONING OF THE ENTIRE SYSTEM WITHOUT EXTRA COMPENSATION.

7. THE CONTRACTOR IS RESPONSIBLE FOR THE COMPLETE AND SATISFACTORY ELECTRICAL INSTALLATION IN ACCORDANCE WITH THE TRUE INTENT OF THE DRAWINGS AND SPECIFICATIONS. HE SHALL PROVIDE, WITHOUT EXTRA CHARGE, ALL INCIDENTAL ITEMS REQUIRED, AS A PART OF THIS ELECTRICAL INSTALLATION. THE INSTALLATION SHALL BE SO MADE THAT ITS SEVERAL COMPONENT PARTS WILL FUNCTION TOGETHER AS A WORKABLE SYSTEM, AND SHALL BE LEFT WITH ALL PARTS ADJUSTED AND IN WORKING ORDER.

8. SECURE AND PAY FOR ALL PERMITS, TAXES, ROYALTIES, LICENSES, AND INSPECTIONS IN ASSOCIATION WITH THE WORK SPECIFIED UNDER ELECTRICAL DIVISION AND INDICATED ON THE DRAWINGS. FILE ALL NECESSARY PLANS, PREPARE ALL DOCUMENTS, AND OBTAIN ALL NECESSARY APPROVALS REQUIRED BY ALL GOVERNMENTAL DEPARTMENTS HAVING JURISDICTION. ALL WORK PERFORMED UNDER THIS CONTRACT SHALL REMAIN EXPOSED TO VIEW UNTIL APPROVED BY THE INSPECTION AUTHORITY.

9. ALL WORK SHALL COMPLY WITH NATIONAL ELECTRICAL CODE (NEC), NATIONAL FIRE PROTECTION ASSOCIATION CODES (NFPA), INTERNATIONAL CODE COUNCIL (ICC) CODES, INCLUDING INTERNATIONAL ENERGY CONSERVATION CODE (IECC), AND ALL APPLICABLE LOCAL, STATE, MUNICIPAL, AND CITY CODES, ORDINANCES AND REGULATIONS.

10. BEFORE STARTING WORK, ELECTRICAL CONTRACTOR SHALL PREPARE AND SUBMIT TO THE ARCHITECT/ENGINEER SHOP DRAWINGS, BROCHURES, INSTALLATION INSTRUCTIONS, AND DESCRIPTIVE EQUIPMENT DATA RELATED TO SPECIFIED EQUIPMENT, WIRING DEVICES, AND ACCESSORIES FOR APPROVAL. THESE DOCUMENTS SHALL BE SUBMITTED IN ELECTRONIC (PDF) FORMAT. ALL SUBMITTALS MUST BE CLEAR AND CONCISE. PARTIAL, PROGRESS, "PIECEMEAL", OR CATALOGUES WILL NOT BE REVIEWED AND WILL BE RETURNED AS INCOMPLETE. (NO EXCEPTIONS, ALLOW A MINIMUM OF SEVEN (7) WORKING DAYS FOR ENGINEER REVIEW.) THE CONTRACTOR SHALL IDENTIFY ANY "LONG LEAD TIME" ITEMS WHICH MAY IMPACT THE OVERALL PROJECT SCHEDULE. ALL BIDS SHALL INCLUDE COSTS ASSOCIATED WITH THE PURCHASE AND DELIVERY OF EQUIPMENT TO MEET THE PROJECT SCHEDULE. NO EQUIPMENT SHALL BE ORDERED, PURCHASED, OR INSTALLED PRIOR TO THE APPROVAL OF SHOP DRAWINGS, BROCHURES, INSTALLATION INSTRUCTIONS, AND SCHEDULES. APPROVAL BY THE ARCHITECT/ENGINEER IS INTENDED TO ESTABLISH CONFORMANCE WITH THE PROJECT DESIGN CONCEPT AND THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS.

11. THE NAMING OF THE MANUFACTURER OR BRAND WITH CATALOG NUMBER OR OTHER PRODUCT IDENTIFICATION WITHOUT THE WORDS "OR EQUAL" IN THE SPECIFICATIONS OR NOTES SHALL INDICATE THAT IT IS THE ONLY PRODUCT APPROVED FOR PURCHASE. IF THE WORDS "OR EQUAL" ARE USED, THEY SHALL BE INTERPRETED AS ESTABLISHING A QUALITY OR PERFORMANCE STANDARD FOR THE MATERIAL OR PRODUCT TO BE PURCHASED. THIS SHALL INDICATE THAT THE ELECTRICAL CONTRACTOR IS NOT RESTRICTED TO THE USE OF THE NAMED AND IDENTIFIED PRODUCT IF A SUBSTITUTE APPROVED BY THE ARCHITECT/ENGINEER IS AVAILABLE; HOWEVER, WHERE A SUBSTITUTION IS REQUESTED, IT WILL BE PERMITTED ONLY WITH THE WRITTEN APPROVAL OF THE ARCHITECT/ENGINEER. NO SUBSTITUTE MATERIAL OR PRODUCT SHALL BE ORDERED, FABRICATED, SHIPPED, OR PROCESSED IN ANY MATTER PRIOR TO THE APPROVAL OF THE ARCHITECT/ENGINEER. THE ELECTRICAL CONTRACTOR SHALL ASSUME ALL RESPONSIBILITY FOR ADDITIONAL EXPENSES, AS REQUIRED, MAKING CHANGES FROM THE ORIGINAL MATERIAL OR PRODUCT SPECIFIED.

12. THE TERM "AS REQUIRED" REFERS TO COMPONENTS THAT MAY BE REQUIRED TO COMPLETE THE NOTED SYSTEM INDICATED IN THE PROJECT DOCUMENTS.

13. THE TERM "VERIFY" REFERS TO A CONDITION WHICH MUST BE CONFIRMED PRIOR TO PROCEEDING WITH THE ORDERING OF MATERIAL OR THE FABRICATION AND INSTALLATION OF A COMPONENT.

14. ABBREVIATIONS THROUGHOUT THE DOCUMENTS COMPLY WITH DOCUMENT ABBREVIATION LIST ON LEGEND OR ARE THOSE IN COMMON USE. ENGINEER WILL DEFINE THE INTENT OF ANY IN QUESTION.

15. THE DRAWINGS ARE DIAGRAMMATIC IN CHARACTER. LOCATIONS SHOWN FOR ELECTRICAL EQUIPMENT, DEVICES, CIRCUITING, ETC., ARE APPROXIMATE. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE WORK WITH THE ARCHITECTURAL, PLUMBING, HVAC, AND OTHER TRADE DRAWINGS FOR THE EXACT DIMENSIONS, CLEARANCES, AND ROUGHING-IN LOCATIONS. THE ELECTRICAL CONTRACTOR SHALL COOPERATE WITH THE OTHER TRADES IF FIELD ADJUSTMENTS ARE REQUIRED TO ACCOMMODATE THE WORK OF OTHERS.

16. DRAWINGS SHALL NOT BE SCALED FOR ROUGH-IN MEASUREMENTS OR USED AS SHOP DRAWINGS. WHERE DIMENSIONS ARE SHOWN ON PLANS OR DETAILS, THESE DIMENSIONS ARE TO BE FIELD-VERIFIED BY THE ELECTRICAL CONTRACTOR AGAINST EXISTING FIELD CONDITIONS, INSTALLATION REQUIREMENTS OF OTHER TRADES, AND THE MANUFACTURER'S SUBMITTALS FOR EQUIPMENT TO BE INSTALLED. SHOULD ANY CONFLICTS ARISE WHICH CANNOT BE EASILY RESOLVED IN THE FIELD WITHOUT CHANGING THE DESIGN INTENT, THE ELECTRICAL CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY.

17. RECORD DOCUMENTS

    A. THE ELECTRICAL CONTRACTOR SHALL MAINTAIN ACCURATE RECORDS OF ALL DEVIATIONS IN WORK AS INSTALLED FROM WORK SPECIFIED ON THE DRAWINGS, OR IN THE SPECIFICATIONS, AND IDENTIFY ORIGIN OF CHANGE.

    B. KEEP A COMPLETE SET OF RECORD DOCUMENT PRINTS IN CUSTODY DURING ENTIRE PERIOD OF CONSTRUCTION AT THE CONSTRUCTION SITE. ON COMPLETION OF THE PROJECT, TWO COMPLETE SETS OF MARKED-UP PRINTS SHOWING THESE DEVIATIONS SHALL BE DELIVERED TO GENERAL CONTRACTOR AND ARCHITECT/ENGINEER. THIS CONTRACT WILL NOT BE CONSIDERED COMPLETED UNTIL THESE RECORD DRAWINGS HAVE BEEN RECEIVED AND REVIEWED BY THE ENGINEER.

    C. THE FOLLOWING ITEMS ARE REPRESENTATIVE, BUT NOT ALL-INCLUSIVE, OF THE INFORMATION WHICH SHALL BE RECORDED ON THE AS-BUILT DRAWINGS:

    - POWER DISTRIBUTION SYSTEM, INCLUDING DISTRIBUTION EQUIPMENT AND EACH CONDUIT AND WIRE SIZE INSTALLED.
    - FINAL LAYOUT AND CIRCUITING FOR POWER AND LIGHTING, SURFACE RACEWAYS AND RELATED EQUIPMENT, INCLUDING EACH CONDUIT AND WIRE SIZE.
    - CHANGES IN PLAN, SECTIONS, ELEVATIONS, AND DETAILS, SUCH AS SHIFTS IN LOCATION OF WALLS, DOORS, AND WINDOWS.
    - FINAL LOCATION AND ARRANGEMENT OF UNDERGROUND UTILITIES AND CONNECTIONS TO EXISTING UTILITIES, INCLUDING ELECTRICAL AND PHONE/TV.

18. BEFORE ANY EQUIPMENT IS INSTALLED, DETERMINE THAT SAID EQUIPMENT WILL PROPERLY FIT WITHIN THE SPACE ALLOCATED. INSTALL ALL EQUIPMENT AND MATERIALS IN SUCH A MANNER AS TO PROVIDE REQUIRED ACCESS FOR SERVICING AND MAINTENANCE. ALLOW AMPLE SPACE FOR REMOVAL OF ALL PARTS THAT REQUIRE REPLACEMENT OR SERVICING.

19. SUFFICIENT ACCESS AND WORKING SPACE SHALL BE PROVIDED AND MAINTAINED ABOUT ALL ELECTRICAL EQUIPMENT TO PERMIT READY AND SAFE OPERATION AND MAINTENANCE OF SUCH EQUIPMENT PER NEC ARTICLE 110 REQUIREMENTS.

20. ALL MATERIALS AND EQUIPMENT SHALL BE NEW, UNDAMAGED, BEAR THE UL LABEL WHERE APPLICABLE, AND BE AS SPECIFIED FOR USE IN EACH SPECIFIC LOCATION. ANY INCIDENTAL ACCESSORIES NECESSARY TO COMPLETE THE WORK IN ALL RESPECTS AND MAKE IT READY FOR OPERATION, EVEN IF NOT SPECIFICALLY SPECIFIED, SHALL BE FURNISHED, DELIVERED, AND INSTALLED BY THE ELECTRICAL CONTRACTOR WITHOUT ADDITIONAL EXPENSE TO THE CLIENT.

21. NOT ALL DETAILS OF SYSTEMS ARE SHOWN ON DRAWINGS, NOR ARE THEY SPECIFIED HEREIN. ELECTRICAL SYSTEMS SHALL BE SUCH AS TO LEGALLY PASS ALL INSPECTIONS BY THE LOCAL INSPECTION DEPARTMENT, STATE AND FEDERAL AUTHORITIES HAVING JURISDICTION.

22. MINOR DETAILS NOT USUALLY SHOWN OR SPECIFIED, BUT NECESSARY FOR THE PROPER INSTALLATION AND OPERATION OF A SYSTEM OR EQUIPMENT, SHALL BE INCLUDED IN THE ELECTRICAL CONTRACTOR'S ESTIMATE, AS IF SPECIFIED OR SHOWN HEREIN.

23. COORDINATE THE INSTALLATION OF ELECTRICAL MATERIALS AND EQUIPMENT ABOVE AND BELOW CEILINGS WITH SUSPENSION SYSTEM, MECHANICAL EQUIPMENT, AND OTHER BUILDING COMPONENTS. ALL COMPONENTS SHALL BE LOCATED AS TIGHT TO STRUCTURE AS POSSIBLE. COORDINATE CEILING CAVITY SPACE CAREFULLY WITH ALL TRADES.

24. CONTRACTOR SHALL NOTIFY ENGINEER 48 HOURS PRIOR TO SUBSTANTIAL COMPLETION OF CONSTRUCTION OR INSTALLATION OF CEILING TILE, TO SCHEDULE A FINAL PUNCH LIST WALK THROUGH.

25. THE CONTRACTOR SHALL PREPARE AN OPERATING AND MAINTENANCE MANUAL COVERING ALL SYSTEMS AND EQUIPMENT INSTALLED UNDER THIS DIVISION. SUBMIT AN OUTLINE OF A PREVENTATIVE MAINTENANCE PROGRAM FOR EACH SYSTEM.

26. WARRANTIES:

    A. PROVIDE COMPLETE WARRANTY INFORMATION FOR EACH ITEM, WHICH SHALL INCLUDE NAME OF PRODUCT OR EQUIPMENT, DATE OF BEGINNING OF WARRANTY OR BOND, DURATION OF WARRANTY OR BOND, AND NAMES, ADDRESSES, AND TELEPHONE NUMBERS OF MANUFACTURING/SERVICING PERSONNEL, AS WELL AS PROCEDURES FOR FILING A CLAIM AND OBTAINING WARRANTY SERVICES.

    B. THE CONTRACTOR SHALL WARRANT ALL MATERIALS, WORKMANSHIP AND THE SUCCESSFUL OPERATION OF ALL EQUIPMENT AND APPARATUS INSTALLED FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF FINAL ACCEPTANCE OF THE ENTIRE WORK AS IDENTIFIED IN THE GENERAL CONDITIONS.

27. THE CONDUIT SYSTEM AND ELECTRICAL ENCLOSURES SHALL BE SECURELY BONDED TOGETHER AND SUPPORTED PER NEC REQUIREMENTS.

28. CONDUIT JOINTS SHALL BE CUT SQUARE AND REAMED SMOOTH. BENDS OR OFFSETS SHALL BE MADE WITH AN APPROVED BENDER OR HICKEY, OR HUB-TYPE CONDUIT FITTINGS. BENDS SHALL BE MADE SO THAT THE CONDUIT IS NOT DAMAGED AND ITS INTERNAL DIAMETER IS NOT EFFECTIVELY REDUCED. THERE SHALL NOT BE MORE THAN THE EQUIVALENT OF FOUR QUARTER BENDS (360° TOTAL) BETWEEN PULL POINTS.

29. CONCEALED CONDUIT SYSTEMS SHALL BE RUN IN A DIRECT LINE WITH LONG SWEEP BENDS AND OFFSETS. EXPOSED CONDUIT RUNS SHALL BE PARALLEL TO AND AT RIGHT ANGLES TO BUILDING LINES, USING CONDUIT FITTINGS FOR ALL TURNS AND OFFSETS.

30. FEEDERS AND BRANCH CIRCUITS SHALL BE PROVIDED WITH APPROPRIATELY SIZED INSULATED EQUIPMENT GROUNDING CONDUCTOR, WHETHER SPECIFICALLY NOTED OR NOT. IF NOTED, THE ELECTRICAL CONTRACTOR IS REQUIRED TO USE THE SIZE OF GROUNDING CONDUCTOR INDICATED ON DRAWINGS. THIS CONDUCTOR SHALL BE CONNECTED FROM THE ELECTRICAL PANEL GROUND BAR TO THE DESIGNATED GROUNDING CONNECTION ON THE ELECTRICAL DEVICE SERVED. ENSURE LISTED GROUND BAR KITS HAVE BEEN INSTALLED PER NEC REQUIREMENTS IN THE ELECTRICAL PANELS.

31. ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL JUNCTION AND PULL BOXES TO PROVIDE ACCESS POINTS FOR PULLING AND FEEDING CONDUCTORS INTO A RACEWAY SYSTEM. JUNCTION AND PULL BOXES AND THEIR COVERS SHALL BE FORMED FROM SHEET STEEL, AND SHALL BE BARE METAL OR FINISHED IN GRAY ENAMEL PAINT. BOXES SHALL BE IN INDUSTRY STANDARD SIZES.

32. OUTLET BOXES WITH THE CORRECT FITTING FOR THE APPLICATION SHALL BE LOCATED AT EACH CONDUCTOR SPLICE POINT, AT EACH OUTLET, SWITCH POINT, OR JUNCTION POINT, AND AT EACH PULL POINT FOR THE CONNECTION OF CONDUIT AND OTHER RACEWAYS. OUTLET BOXES FOR CONCEALED WIRING SHALL BE MADE FROM GALVANIZED OR CADMIUM-PLATED SHEET STEEL, AND THEY SHALL HAVE A DEPTH OF AT LEAST 1.5 INCHES, WHETHER SINGLE OR GANGED. THE BOXES SHALL BE LARGE ENOUGH SIZE TO ACCOMMODATE THE NUMBER OF WIRING DEVICES AND CONDUCTORS AS SPECIFIED IN THE FILL SCHEDULE OF THE CURRENT NEC. SECURE BOXES WITH MOUNTING BRACKET, BRACES, HANGER OR BOX MOUNTING SUPPORT.

33. POWER AND DATA/TELECOMMUNICATIONS OUTLETS, FLUSH OR SURFACE MOUNTED ON WALLS, SHALL BE MOUNTED 18" ABOVE FINISHED FLOOR FROM FLOOR TO CENTERLINE OF THE BOX (AFF). LIGHT SWITCHES SHALL BE MOUNTED 48" AFF TO CENTERLINE OF THE BOX, IN ORDER TO COMPLY WITH ADA REQUIREMENTS, UNLESS OTHERWISE NOTED. REFER TO ARCHITECTURAL DRAWINGS FOR DEVICE INSTALLATION HEIGHTS PRIOR TO ROUGH-IN.

34. ELECTRICAL DEVICES (SWITCHES, RECEPTACLES, ETC.) SHALL BE 20A RATED UNLESS OTHERWISE SPECIFIED ON DRAWINGS. VERIFY DEVICE CONFIGURATION, COLOR, FINISH, AND MATERIAL REQUIREMENTS WITH ARCHITECT.

35. WIRING INSIDE THE BUILDING SHALL BE COPPER, INSULATION TYPE THHN/THWN, UNLESS OTHERWISE NOTED. THE MINIMUM CONDUCTOR SIZE SHALL BE 12 AWG. CONDUCTORS SIZED FROM 8 AWG AND LARGER SHALL BE STRANDED. WHERE MC TYPE FLEXIBLE CABLE IS INSTALLED IN LIEU OF WIRE AND CONDUIT, FULL-SIZE EQUIPMENT GROUNDING CONDUCTOR SHALL RUN WITH CURRENT CARRYING CONDUCTORS. (MC TYPE FLEXIBLE CABLE MAY BE USED ONLY AS AUTHORIZED BY OWNER AND DESIGN ENGINEER, AND WITH APPROVAL OF LOCAL CODE AUTHORITY.)

36. CONDUCTORS SIZES 6AWG AND SMALLER SHALL BE FACTORY COLOR-CODED WITH AN INDUSTRY-STANDARD DESIGNATED COLOR FOR EACH PHASE AND A NEUTRAL CONDUCTOR. CONDUCTORS SIZES 4 AND LARGER SHALL HAVE COLORS FIELD APPLIED USING THE COLOR MARKING TAPE OR BY PAINTING THE INSULATION. THESE COLORS SHALL BE USED CONSISTENTLY THROUGHOUT THE SYSTEM.

37. ALL JOINTS OR SPLICES FOR 10 AWG CONDUCTORS OR SMALLER SHALL BE MADE WITH UL-APPROVED WIRE NUTS, "IN-SURE" PUSH-IN CONNECTORS, OR COMPRESSION-TYPE CONNECTORS.

38. ALL JOINTS OR SPLICES FOR CONDUCTORS 8 AWG AND LARGER SHALL BE MADE WITH A MECHANICAL COMPRESSION CONNECTOR. AFTER THE CONDUCTORS HAVE BEEN MADE MECHANICALLY AND ELECTRICALLY SECURE, THE ENTIRE JOINT OR SPLICE SHALL BE COVERED WITH 3M SCOTCH BRAND NO. 33 TAPE, OR APPROVED EQUAL, TO MAKE THE INSULATION VALUE AT THE JOINT OR SPLICE EQUAL TO THE VALUE OF THE CONDUCTORS INSULATION. THE CONNECTORS SHALL BE UL APPROVED.

39. UNLESS OTHERWISE INDICATED, ALL WIRING FOR BRANCH CIRCUITS SHALL BE 12 AWG WHEN PROTECTED BY A 15- OR 20- AMP CIRCUIT BREAKER. IF DISTANCE FROM PANEL TO FIRST DEVICE IS 75 FEET OR GREATER FOR 120-VOLT CIRCUITS, OR 150 FEET OR GREATER FOR 277-VOLT CIRCUITS, 10 AWG WIRING SHALL BE INSTALLED.

40. FOR ALUMINUM CONDUCTOR TERMINATIONS, ALUMINUM BI-METALLIC PIN CONNECTORS ARE RECOMMENDED UNLESS COMPACT-TYPE CONDUCTORS ARE USED. THESE CONNECTORS SHALL BE UL LISTED PER UL486B, RATED FOR USE UP TO 600V AND TEMPERATURE UP TO 90°C. CONNECTORS SHALL BE INSTALLED WITH MANUFACTURER'S SPECIFIED CRIMPING TOOLS AND DIES.

41. INSTALLATION IN AREAS OF DRYWALL CEILING SHALL BE COORDINATED SUCH THAT ACCESS PANELS ARE NOT REQUIRED. ELEMENTS REQUIRING ACCESS SHALL BE LOCATED IN THE AREAS OF ACCESSIBLE CEILING, OR IN THE LOCATIONS COORDINATED WITH ARCHITECT. ACCESS PANELS REQUIRED WITHIN DRYWALL CEILINGS SHALL BE INSTALLED SYMMETRICALLY WITH OTHER PANELS OR DEVICES, AND SHALL BE MINIMUM SIZE REQUIRED, "MUD-IN" TYPE, AND FIRE RATED, IF REQUIRED. ACCESS PANELS IN FIRE-RATED WALLS AND CEILINGS SHALL HAVE PROPER UL LABEL AND FIRE RATING LISTING.

42. WALL AND CEILING ROUGH-IN INSTALLATIONS FOR LOW-VOLTAGE AND CONTROL WIRING OF ANY TYPE, SUCH AS DATA/TELECOMMUNICATIONS WIRING, FIRE ALARM WIRING, HVAC CONTROL WIRING, SECURITY SYSTEMS WIRING, TV CABLING, OPTICAL FIBER CABLING, ETC., SHALL BE COMPLETED BY THE ASSOCIATED CONTRACTOR AND READY FOR INSPECTION AT THE TIME OF ELECTRICAL ROUGH-IN INSPECTION. THE SHARP EDGES OF RACEWAYS AND BOXES, CONDUIT ENDS AND METAL STUDS, ETC., FOR MENTIONED CABLING SHALL BE PROTECTED BY INSULATED BUSHINGS OR GROMMETS. THE ASSOCIATED LOW VOLTAGE WIRING CONTRACTOR SHALL SECURELY FASTEN THE CABLES IN THE OPENINGS FOR THE WALL ROUGH-IN INSPECTIONS. WORK SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER (GROUPED CABLES ROUTED WITH SQUARE CORNERS AND PARALLEL TO BUILDING LINES.) THE LOW VOLTAGE INSTALLER SHALL PROVIDE THE REQUIRED SEPARATIONS BETWEEN THE SYSTEMS WIRING AND SUPPORT THE CABLES FROM THE BUILDING STRUCTURE AS NEEDED. CABLE TIES USED IN DUCTS, PLENUMS, AND OTHER AIR-HANDLING SPACES ARE REQUIRED TO HAVE A TESTING LABORATORY LISTING NUMBER AND LABEL ON EACH UNOPENED PACKAGE AS BEING APPROVED FOR USE IN THESE LOCATIONS.

43. ELECTRICAL CABINETS AND ENCLOSURES LOCATED IN PUBLIC AREAS SHALL BE LOCKABLE TYPE.

44. PENETRATIONS THROUGH STRUCTURAL MEMBERS SHALL NOT BE PERMITTED WITHOUT SPECIFIC WRITTEN PERMISSION FROM STRUCTURAL ENGINEER AND ARCHITECT. SUBMIT REQUESTS FOR PENETRATIONS TO ARCHITECT FOR REVIEW AND DISPOSITION. PRIOR TO CORE DRILLING THROUGH FLOORS, VERIFY CLEARANCE OF BEAMS, DUCTWORK, ETC., IN CEILING SPACE BELOW, AND X-RAY FOR CONDUIT AND/OR REBAR IN SLAB.

45. ALL ROOF PENETRATIONS SHALL BE SEALED WATER TIGHT. PROVIDE FLASHING AND COUNTER FLASHING AS REQUIRED. COORDINATE ROOFING WORK WITH THE GENERAL CONTRACTOR.

46. RACEWAYS SHALL BE PROVIDED WITH EXPANSION FITTINGS WHERE NECESSARY TO COMPENSATE FOR THERMAL EXPANSION AND CONTRACTION, AND TO ALLOW FOR MINOR MOVEMENT OF THE STRUCTURAL ELEMENTS OF THE BUILDING. EXPANSION FITTINGS FOR METAL RACEWAYS SHALL BE MADE ELECTRICALLY CONTINUOUS BY EQUIPMENT BONDING JUMPERS OR OTHER MEANS.

47. PROVIDE TYPEWRITTEN PANELBOARD DOOR DIRECTORIES WITH ACCURATE BRANCH CIRCUIT DESTINATIONS. CLEARLY MARK JUNCTION BOXES IN CEILING SPACE WITH PANEL DESIGNATIONS AND CIRCUIT NUMBERS. PROVIDE ENGRAVED PLASTIC LABELS FOR ALL DISTRIBUTION EQUIPMENT. ATTACH THESE LABELS PERMANENTLY TO EQUIPMENT WITH RIVETS OR SCREWS. SELF ADHESIVE TYPE IS NOT ACCEPTABLE. LABEL OUTLET AND SWITCH COVER PLATES WITH PANEL DESIGNATION AND CIRCUIT NUMBERS.

48. REQUIREMENTS FOR MECHANICAL EQUIPMENT ELECTRICAL CONNECTIONS:

    A. ELECTRICAL CONTRACTOR SHALL REVIEW MECHANICAL AND PLUMBING DRAWINGS AND SCHEDULES FOR VERIFICATION OF THE EQUIPMENT USED, WIRING AND ADDITIONAL INSTALLATION REQUIREMENTS PRIOR TO PROVIDING REQUIRED STARTERS/DISCONNECT SWITCHES. WHEN EQUIPMENT DELIVERED TO JOB SITE, ELECTRICAL CONTRACTOR SHALL VERIFY THIS DATA WITH EQUIPMENT NAMEPLATES OR MANUALS. IF SIGNIFICANT DISCREPANCIES OCCUR CONTACT ELECTRICAL ENGINEER FOR REVISION OF THE CONSTRUCTION DOCUMENTS.

    B. PROVIDE SAFETY DISCONNECT SWITCHES FOR ALL MECHANICAL EQUIPMENT UNLESS PROVIDED BY MECHANICAL CONTRACTOR AS SPECIFICALLY DIRECTED ON MECHANICAL DRAWING OR SPECIFICATION REQUIREMENTS.

    C. ELECTRICAL WIRING IN CONNECTION WITH THE AUTOMATIC TEMPERATURE CONTROL SYSTEM, WHERE SHOWN ON THE ELECTRICAL DIVISION DRAWINGS, SHALL BE PERFORMED BY THE ELECTRICAL CONTRACTOR. ALL OTHER WIRING, INCLUDING 120V REQUIRED FOR PROPER OPERATION OF THE AUTOMATIC TEMPERATURE CONTROL SYSTEM, SHALL BE PERFORMED BY THE MECHANICAL CONTRACTOR.

49. PROVIDE FIRE STOPPING MATERIAL AND SYSTEMS, AS LISTED IN THE UL FIRE RESISTANCE DIRECTORY, EQUAL TO THE FIRE RESISTANCE RATING OF THE RESPECTIVE WALL OR FLOOR ASSEMBLY FOR ALL PENETRATIONS OF CONDUIT, SLEEVES, WIRING, CABLES AND OTHER ELECTRICAL ITEMS THROUGH FIRE-RATED CORRIDOR WALLS, FIRE RESISTIVE WALLS, FIRE RESISTIVE SHAFTS, AND FLOOR PENETRATIONS.

50. TELECOMMUNICATIONS

    A. REFER TO TELECOMMUNICATIONS DRAWINGS, AND COORDINATE WITH TELECOMMUNICATIONS CONTRACTOR FOR EXACT LOCATION, REQUIREMENTS, SPECIFICATION AND ROUTING FOR ALL CONDUITS, RACEWAYS, JUNCTION BOXES AND FLOOR PENETRATIONS PRIOR TO ROUGH-IN.

    B. ALL TELECOMMUNICATIONS CABLING SHALL BE INSTALLED BY OWNER'S VENDOR.

    C. ELECTRICAL CONTRACTOR SHALL VERIFY QUANTITY AND TYPE OF DATA/PHONE/AUDIO/VIDEO PORTS TO BE INCLUDED IN FLOOR POKE-THRU DEVICES OR FLOOR BOXES WITH TELECOMMUNICATIONS CONTRACTOR PRIOR TO ORDERING OF SUB-PLATES AND REQUIRED ACCESSORIES.

    D. ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL GROUND BAR IN THE PHONE/DATA ROOM. PROVIDE 6 AWG COPPER CONDUCTOR FROM BUILDING GROUNDING ELECTRODE CONDUCTOR TO GROUND BAR. COORDINATE EXACT BAR LOCATION AND ADDITIONAL REQUIREMENTS WITH TELECOMMUNICATIONS CONTRACTOR.

51. FIRE ALARM

    A. GENERAL CONTRACTOR SHALL SOLICIT BIDS FROM FIRE ALARM CONTRACTORS FOR DESIGN AND INSTALLATION OF AN APPROVED FIRE ALARM SYSTEM AND DEVICES WHICH SHALL COMPLY WITH APPLICABLE CODES AND REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION.

    B. REQUIRED FIRE ALARM SYSTEM SHALL BE PROVIDED ON A DESIGN/BUILD BASIS BY FIRE ALARM CONTRACTOR. PRIOR TO BIDDING, FIRE ALARM CONTRACTOR SHALL VERIFY FIRE ALARM SYSTEM CAPABILITIES AND FIRE ALARM DEVICE LOCATIONS IN THIS SCOPE OF WORK. FIRE ALARM CONTRACTOR SHALL PREPARE AND SUBMIT SHOP DRAWINGS AND EQUIPMENT BROCHURES TO AUTHORITIES HAVING JURISDICTION, SUCH AS FIRE DEPARTMENT, BUILDING DEPARTMENT, ETC., AS REQUIRED, FOR REVIEW AND APPROVAL. CONTRACTOR SHALL ALSO PROVIDE THE ENGINEER WITH ONE (1) SET OF DRAWINGS, CALCULATIONS AND EQUIPMENT SUBMITTALS FOR HIS REVIEW AND RECORD.

    C. PROVIDE REQUIRED CONDUCTORS, ZAM'S, JAM'S, AND OTHER EQUIPMENT NECESSARY IN ORDER TO INSTALL SYSTEM AS REQUIRED. PROVIDE SYNCHRONIZING MODULES FOR STROBES. PRIOR TO PURCHASING FIRE ALARM DEVICES, PROVIDE CUT SHEETS, SHOP DRAWINGS, AND SEQUENCE OF OPERATION TO BUILDING OWNER AND FIRE PREVENTION BUREAU FOR THEIR APPROVAL AND TO ENGINEER FOR HIS REVIEW.

    D. MOUNT STROBES +80" AFF OR 6" BELOW THE CEILING, WHICHEVER IS LOWER. ENSURE ALL STROBE LIGHTS ARE SYNCHRONIZED.

    E. FIRE ALARM CONTRACTOR SHALL FURNISH DUCT DETECTORS (120V OR 24V), WITH REMOTE INDICATING LIGHT AND TEST SWITCH, FOR ALL MECHANICAL AIR-MOVING SYSTEMS WHERE REQUIRED BY CODE OR LOCAL AUTHORITIES. DETECTORS SHALL BE OF THE SAME MANUFACTURER AS FIRE ALARM SYSTEM. MECHANICAL CONTRACTOR SHALL INSTALL DETECTORS IN THE MECHANICAL DUCTWORK, AS REQUIRED BY CODE, TO FACILITATE MOTOR SHUTDOWN UPON DETECTION OF SMOKE. ELECTRICAL CONTRACTOR SHALL HARDWIRE DETECTOR TO THE FAN MOTOR (THROUGH A POWER-INTERRUPTING RELAY) FOR SHUTDOWN UPON DETECTION OF SMOKE; AND IF REQUIRED BY CODE, THE FIRE ALARM CONTRACTOR SHALL CONNECT TO FIRE ALARM SYSTEM AS TROUBLE ALARM. COORDINATE REQUIREMENTS AND SPECIFICATIONS WITH BUILDING OWNER OR BUILDING FIRE ALARM REPRESENTATIVE. SUBMIT DRAWINGS AND EQUIPMENT CUT SHEETS FOR ENGINEERS' REVIEW AND FIRE DEPARTMENT APPROVAL.

    F. FIRE/SMOKE DAMPERS SHALL BE ACTIVATED PER IMC SECTION 607.3.3.3. ACTIVATION SHALL BE PROVIDED BY FIRE ALARM CONTRACTOR.

    G. ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL STAND-ALONE COMBINATION SMOKE/CO DETECTORS REQUIRED PER IBC ARTICLE 907 IN DWELLING UNITS. PROVIDE 120V CONNECTION AND INTERCONNECTIONS BETWEEN DETECTORS AS REQUIRED.

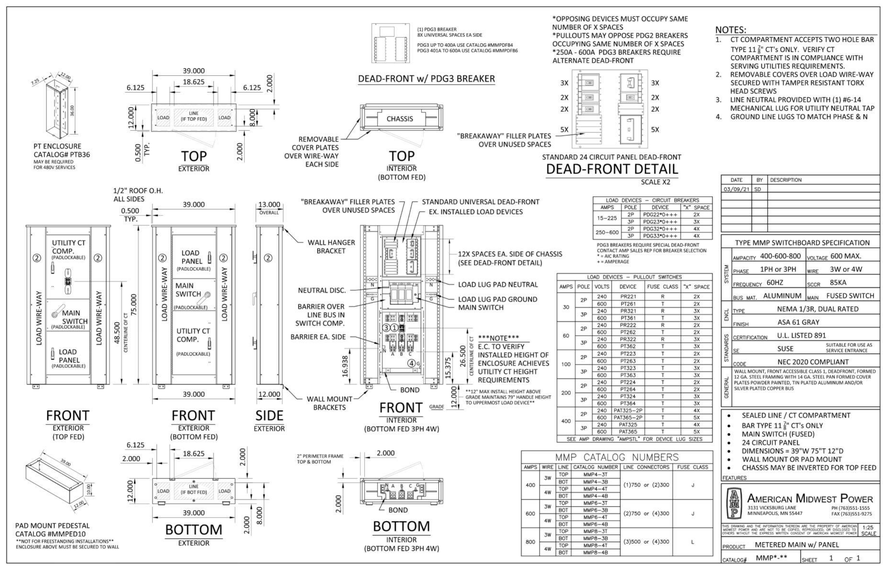
    H. FIRE ALARM SPEAKERS ARE REQUIRED IN

Residential Load Calculations for Granite Street Apartments - East Building

Floor	Number of units	Unit Type	Unit Area, sq. ft.	General Lighting and Receptacles, VA	Small Appliances and Laundry, VA	Dishwasher, VA	Garbage Disposal, VA	Microwave with hood, VA	Refrigerator, VA	Range, VA	Water Heater, VA	Dryer, VA	Condensing Unit Load (per 220.82(C)(1)), VA	FCU Fan Load (per 220.82(C)(2)), VA	FCU Heating Load (for 220.82(C)(4)), VA	65% of FCU Heating Load (per 220.82(C)(4)), VA	Largest HVAC Load (per 220.82(C)(1-4)), VA	General Lighting and Receptacles (per 220.82(B)(1)), VA	Small Appliances and Laundry (per 220.82(B)(2)), VA	Appliances Nameplate Ratings (per 220.82(B)(3)), VA	General Demand Load (per 220.82(B)), VA	Largest HVAC Load (per 220.82(C)(1-4)), VA	Total Demand Load, VA	Total Demand, A	Connected loads (per Article 220.84(C)), VA	Demand Factor (per Table 220.84), %	Calculated Service Load (per Article 220.84), VA	Calculated Service Load (per Article 220.84), A	Recommended Feeder Size, A
1	1	1.1	645	1935	4500	1200	690	1500	800	8000	4500	5000	6000	656	6000	3900	6656	1935	4500	21690	17250	6656	23906	114.9					
1	1	1.2	660	1980	4500	1200	690	1500	800	8000	4500	5000	6000	656	6000	3900	6656	1980	4500	21690	17268	6656	23924	115.0					
1	2	2.1	930	2790	4500	1200	690	1500	800	8000	4500	5000	6000	864	6000	3900	6864	2790	4500	21690	17592	6864	24456	117.6					
2	1	1.1	645	1935	4500	1200	690	1500	800	8000	4500	5000	6000	656	6000	3900	6656	1935	4500	21690	17250	6656	23906	114.9					
2	1	1.2	660	1980	4500	1200	690	1500	800	8000	4500	5000	6000	656	6000	3900	6656	1980	4500	21690	17268	6656	23924	115.0					
2	2	2.1	930	2790	4500	1200	690	1500	800	8000	4500	5000	6000	864	6000	3900	6864	2790	4500	21690	17592	6864	24456	117.6					
3	2	S.1	470	1410	4500	1200	690	1500	800	8000	4500	5000	4500	700	4500	2925	5200	1410	4500	21690	17040	5200	22240	106.9					
3	1	S.2	420	1260	4500	1200	690	1500	800	8000	4500	5000	4500	700	4500	2925	5200	1260	4500	21690	16980	5200	22180	106.6					
RDE	**11**		**7690**	**23070**	**49500**	**13200**	**7590**	**16500**	**8800**	**88000**	**49500**	**55000**					**69680**								**380840**	**42**	**159953**	**444.0**	**450**
TOTAL	**11**		**7690**	**23070**	**49500**	**13200**	**7590**	**16500**	**8800**	**88000**	**49500**	**55000**					**69680**								**380840**	**42**	**159953**	**444.0**	**450**

Residential Load Calculations for Granite Street Apartments - West Building

Floor	Number of units	Unit Type	Unit Area, sq. ft.	General Lighting and Receptacles, VA	Small Appliances and Laundry, VA	Dishwasher, VA	Garbage Disposal, VA	Microwave with hood, VA	Refrigerator, VA	Range, VA	Water Heater, VA	Dryer, VA	Condensing Unit Load (per 220.82(C)(1)), VA	FCU Fan Load (per 220.82(C)(2)), VA	FCU Heating Load (for 220.82(C)(4)), VA	65% of FCU Heating Load (per 220.82(C)(4)), VA	Largest HVAC Load (per 220.82(C)(1-4)), VA	General Lighting and Receptacles (per 220.82(B)(1)), VA	Small Appliances and Laundry (per 220.82(B)(2)), VA	Appliances Nameplate Ratings (per 220.82(B)(3)), VA	General Demand Load (per 220.82(B)), VA	Largest HVAC Load (per 220.82(C)(1-4)), VA	Total Demand Load, VA	Total Demand, A	Connected loads (per Article 220.84(C)), VA	Demand Factor (per Table 220.84), %	Calculated Service Load (per Article 220.84), VA	Calculated Service Load (per Article 220.84), A	Recommended Feeder Size, A
1	1	1.1	645	1935	4500	1200	690	1500	800	8000	4500	5000	6000	656	6000	3900	6656	1935	4500	21690	17250	6656	23906	114.9					
1	1	1.2	660	1980	4500	1200	690	1500	800	8000	4500	5000	6000	656	6000	3900	6656	1980	4500	21690	17268	6656	23924	115.0					
1	1	1.3A	720	2160	4500	1200	690	1500	800	8000	4500	5000	6000	656	6000	3900	6656	2160	4500	21690	17340	6656	23996	115.4					
1	1	2.1	930	2790	4500	1200	690	1500	800	8000	4500	5000	6000	864	6000	3900	6864	2790	4500	21690	17592	6864	24456	117.6					
2	1	1.1	645	1935	4500	1200	690	1500	800	8000	4500	5000	6000	656	6000	3900	6656	1935	4500	21690	17250	6656	23906	114.9					
2	1	1.2	660	1980	4500	1200	690	1500	800	8000	4500	5000	6000	656	6000	3900	6656	1980	4500	21690	17268	6656	23924	115.0					
2	1	1.3	715	2145	4500	1200	690	1500	800	8000	4500	5000	6000	656	6000	3900	6656	2145	4500	21690	17334	6656	23990	115.3					
2	1	2.1	930	2790	4500	1200	690	1500	800	8000	4500	5000	6000	864	6000	3900	6864	2790	4500	21690	17592	6864	24456	117.6					
3	1	1.4	600	1800	4500	1200	690	1500	800	8000	4500	5000	6000	656	6000	3900	6656	1800	4500	21690	17196	6656	23852	114.7					
3	2	S.1	470	1410	4500	1200	690	1500	800	8000	4500	5000	4500	700	4500	2925	5200	1410	4500	21690	17040	5200	22240	106.9					
RDW	**11**		**7445**	**22335**	**49500**	**13200**	**7590**	**16500**	**8800**	**88000**	**49500**	**55000**					**70720**								**381145**	**42**	**160081**	**444.3**	**450**
TOTAL	**11**		**7445**	**22335**	**49500**	**13200**	**7590**	**16500**	**8800**	**88000**	**49500**	**55000**					**70720**								**381145**	**42**	**160081**	**444.3**	**450**



FEEDER SCHEDULE

X	# OF SETS	CONDUCTORS	GROUND CONDUCTOR	CONDUIT SIZE
800.4N	3	4-400KCMIL AL		3"
600.4	2	4-500KCMIL AL	1-2/0 AL	3 1/2"
400.4	2	4-250KCMIL AL	1-1 AL	2 1/2"
200.4	1	4-250KCMIL AL	1-4 AL	2 1/2"
125.3R	1	3-1/0 AL	1-4 AL	1 1/2"

LEGEND: TYPICAL LABEL FORMAT IS **AAA.BC**, WHERE: **AAA**-REFERS TO CONDUCTORS CURRENT RATING **B**-NUMBER OF CURRENT CARRYING CONDUCTORS **C**-OPTIONS: **N**-SERVICE ENTRANCE; **S**-TRANSFORMER SECONDARY CONDUCTORS; **T** - TAP RULE PER NEC ARTICLE 250.122(G) FOR EQUIPMENT GROUNDING CONDUCTOR SIZING; **F** - 2-HOUR FIRE-RATED ENCLOSURE PER NEC 700.10(D); **R** - RESIDENTIAL FEEDERS PER NEC 310.12; **V** - VOLTAGE DROP COMPENSATION.

ELECTRICAL SERVICE NOTES

1. OWNER AND GENERAL CONTRACTOR ARE RESPONSIBLE FOR SUBMITTING ELECTRICAL SERVICE APPLICATION AND FULL SET OF LATEST ELECTRICAL DRAWINGS AS PART OF THE SERVICE REQUEST PACKAGE TO THE LOCAL ELECTRICAL UTILITY COMPANY. COPY OF THE SUBMITTED APPLICATION SHALL BE PROVIDED TO ELECTRICAL CONTRACTOR AND ELECTRICAL ENGINEER FOR RECORD AND REVIEW.
2. GENERAL AND ELECTRICAL CONTRACTORS ARE RESPONSIBLE FOR SCHEDULING ON SITE MEETING WITH LOCAL ELECTRICAL UTILITY COMPANY REPRESENTATIVE FOR VERIFICATION OF THE EXISTING FIELD CONDITIONS, COORDINATION OF THE REQUIRED MODIFICATIONS, AND INSTALLATION OF THE NEW ELECTRICAL SERVICE EQUIPMENT.
3. LOCAL ELECTRICAL UTILITY REPRESENTATIVE AND ELECTRICAL CONTRACTOR SHALL JOINTLY REVIEW THE SET OF THE ELECTRICAL CONSTRUCTION DOCUMENTS, INCLUDING ELECTRICAL ONE-LINE DIAGRAM(S), LOAD CALCULATIONS, PANEL SCHEDULES, AND SERVICE EQUIPMENT LAYOUT AND SELECTION.
4. ELECTRICAL CONTRACTOR SHALL COORDINATE ADDITIONAL INSTALLATION REQUIREMENTS PER LOCAL UTILITY REGULATIONS, STANDARDS FOR INSTALLATION AND USE.
5. IF PROPOSED INSTALLATION IS NOT COMPLIANT WITH LOCAL UTILITY STANDARDS, OWNER AND GENERAL CONTRACTORS ARE RESPONSIBLE FOR SUBMITTING NECESSARY DOCUMENTS REQUESTING AN EXCEPTION FOR THIS PARTICULAR PROJECT. THIS SUBMITTAL MUST BE COMPLETE BEFORE START OF CONSTRUCTION. ADDITIONAL DOCUMENTATION, INCLUDING DETAILS, PROPOSED INSTALLATION INFORMATION, ELECTRICAL ONE-LINE DIAGRAMS, AND ASSOCIATED BUILDING SECTIONS AND FLOOR PLANS SHALL BE INCLUDED INTO SUBMISSION PACKAGE.
6. NO EQUIPMENT SHALL BE PURCHASED WITHOUT PRIOR LOCAL UTILITY COMPANY APPROVAL FOR PROPOSED SERVICE CONFIGURATION, VOLTAGE, ANY EXCEPTIONS IF PRESENT, AND EQUIPMENT LAYOUT.

[X] GROUNDING NOTES

GROUNDING ELECTRODE SYSTEM AND GROUNDING ELECTRODE CONDUCTORS SHALL BE INSTALLED PER NATIONAL ELECTRICAL CODE (NEC) ARTICLE 250 REQUIREMENTS.

AT MINIMUM, FOLLOWING GROUNDING ELECTRODE CONNECTIONS SHALL BE ESTABLISHED:

1. 2 AWG CU GROUNDING ELECTRODE CONDUCTOR, SIZED PER TABLE 250.66, TO METAL UNDERGROUND WATER PIPE. PIPE SHALL BE IN DIRECT CONTACT WITH THE EARTH FOR 10 FEET OR MORE AND ELECTRICALLY CONTINUOUS PER ARTICLE 250.52(A)(1) REQUIREMENTS. GROUNDING ELECTRODE CONDUCTOR SHALL BE CONNECTED WITHIN FIVE FEET FROM THE POINT OF PIPE ENTRANCE TO THE BUILDING PER ARTICLE 250.68(C).
2. MINIMUM 4 AWG CU GROUNDING ELECTRODE CONDUCTOR TO CONCRETE-ENCASED ELECTRODE PER ARTICLE 250.52(A)(3) REQUIREMENTS.
3. MINIMUM 6 AWG CU GROUNDING ELECTRODE CONDUCTOR TO ROD ELECTRODE PER ARTICLE 250.52(A)(5) REQUIREMENTS. ROD SHALL NOT BE SMALLER THAN 3/4" DIAMETER AND NOT SHORTER THAN EIGHT FEET.
4. 2 AWG COMMON GROUNDING ELECTRODE CONDUCTOR, SIZED PER TABLE 250.66, SHALL BE PROVIDED PER ARTICLE 250.58 REQUIREMENTS TO CONNECT SERVICE EQUIPMENT ENCLOSURES TO GROUNDING BUSBAR. THE GROUNDING ELECTRODE CONDUCTOR SHALL BE CONNECTED TO THE GROUNDED SERVICE CONDUCTOR IN ACCESSIBLE ENCLOSURE ON THE SUPPLY SIDE OF THE SERVICE DISCONNECT MEANS.
5. 2 AWG MAIN BONDING JUMPER, FOR CONNECTION BETWEEN THE GROUNDED CIRCUIT CONDUCTOR AND THE EQUIPMENT GROUNDING CONDUCTOR AT THE SERVICE, AND SUPPLY SIDE EQUIPMENT BONDING JUMPER, SIZED PER TABLE 250.102(C)(1).

COORDINATE IF ANY ADDITIONAL WORK WILL BE REQUIRED PER LIGHTNING PROTECTION SCOPE OF WORK.

SERIES RATING NOTES

FOR THE PURPOSE OF THIS PROJECT IT IS ASSUMED THAT SIEMENS ELECTRICAL DISTRIBUTION EQUIPMENT WILL BE USED. IN CASE OF ALTERNATE EQUIPMENT SELECTION, ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING SERIES RATING NOTES ACCORDING TO MANUFACTURER'S PUBLICATIONS.
BASED ON THE SIEMENS PUBLICATION #CBTA-00101-1020 ISSUED IN OCTOBER 2020, SERIES CONNECTED SHORT CIRCUIT RATINGS (SEE TABLES ON THIS DRAWING), THE FOLLOWING RESTRICTIONS FOR OVERCURRENT PROTECTION DEVICES APPLY:

1. CIRCUIT BREAKERS IN RESIDENTIAL PANELS BOARDS "RD*" FEEDING RESIDENTIAL LOAD CENTERS SHALL BE 3VA-TYPE BREAKERS. BRANCH CIRCUIT BREAKERS IN RESIDENTIAL LOAD CENTERS SHALL BE OF THE FOLLOWING TYPES: QPH, BLH OR BQH AS SHOWN IN THE PUBLICATION. THIS COMBINATION PROVIDES SERIES RATING UP TO 65,000AIC.
2. EQUIPMENT ENCLOSURES FOR CIRCUIT BREAKERS OR FUSES APPLIED IN COMPLIANCE WITH SERIES COMBINATION RATINGS SHALL BE LEGIBLE MARKED IN THE FIELD PER NEC ARTICLE 110.22 REQUIREMENTS TO INDICATE THE EQUIPMENT HAS BEEN APPLIED WITH A SERIES COMBINATION RATING. THE MARKING SHALL BE READILY VISIBLE AND STATE THE FOLLOWING,"CAUTION - SERIES COMBINATION SYSTEM RATED ---------- AMPERES. IDENTIFIED REPLACEMENT COMPONENTS REQUIRED."

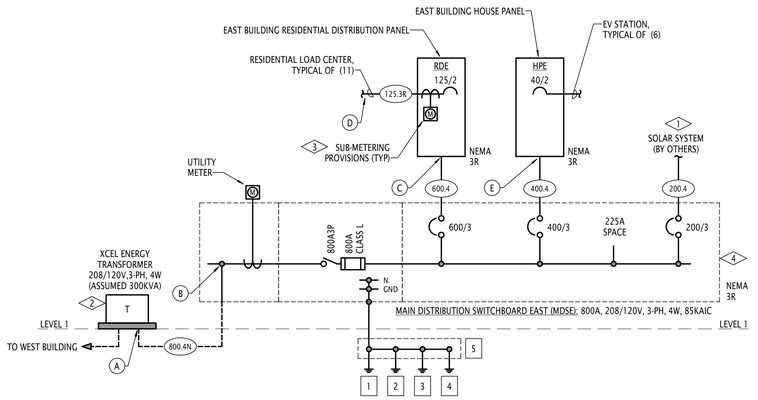
[X] ELECTRICAL DETAIL NOTES

1 SOLAR SYSTEM DESIGN BY OTHERS. COORDINATE EXACT SCOPE OF WORK AND ADDITIONAL REQUIREMENTS WITH SOLAR SYSTEM DESIGNER.

2 ELECTRICAL CONTRACTOR SHALL COORDINATE SCOPE OF WORK ASSOCIATED WITH UTILITY ELECTRICAL SERVICE WITH XCEL ENERGY REPRESENTATIVE AND DRY UTILITIES COORDINATOR IF HIRED FOR THIS PROJECT. IT IS ASSUMED THAT THE "EAST" BUILDING AND "WEST" BUILDING WILL BE CONNECTED TO A SINGLE TRANSFORMER. FOR THE SCOPE OF THIS PROJECT IT IS ASSUMED THAT THE 750KVA PAD-MOUNTED UTILITY TRANSFORMER WITH A SECONDARY 208/120V, 3-PHASE, 4-WIRE CONNECTION WILL BE PROVIDED. REFER TO XCEL ENERGY "STANDARDS FOR ELECTRICAL INSTALLATION AND USE" FOR ADDITIONAL ELECTRICAL SERVICE REQUIREMENTS. THE AVAILABLE FAULT CURRENT FOR THIS TRANSFORMER SIZE WILL BE 39,100 AIC. ELECTRICAL CONTRACTOR SHALL CONFIRM THE TRANSFORMER SIZE WITH XCEL ENERGY DESIGNER/PLANNER. CONTACT ELECTRICAL ENGINEER IF TRANSFORMER WILL BE SIZED DIFFERENTLY COMPARED TO SHOWN ON DRAWINGS. FAULT CURRENT CALCULATIONS MIGHT NEED TO BE REVISED TO REFLECT AVAILABLE LEVEL OF THE SHORT CIRCUIT CURRENT.

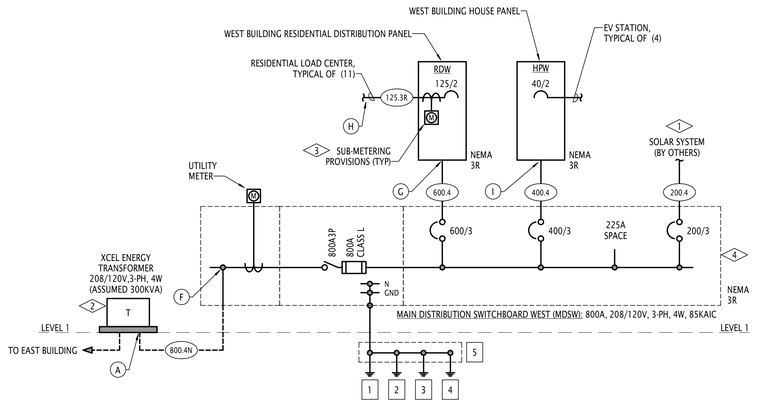
3 BASIS OF DESIGN INCLUDES USE OF SIEMENS PANELBOARD WITH INTEGRATED SEM3 MULTIPOINT METERING (OR EATON PRL3 AND PRL4 PANELBOARDS WITH INTEGRATED POWER XPERT MULTI-POINT METERING) OR OWNER APPROVED EQUAL. COORDINATE COMPATIBILITY OF THE EQUIPMENT WITH OWNER AND THIRD-PARTY SUB-METERING PROVIDER. REFER TO MANUFACTURER'S DOCUMENTATION FOR PROPER EQUIPMENT INSTALLATION.

4 BASIS OF DESIGN INCLUDES USE OF 800A, 208/120V, 3-PH, 4W, NEMA 3R METERED MAIN PANELBOARD AS MANUFACTURED BY AMERICAN MIDWEST POWER, CAT.# MMP8-4B, OR OWNER APPROVED EQUAL. REFER TO MANUFACTURER'S DOCUMENTATION FOR PROPER EQUIPMENT INSTALLATION.



1 ONE-LINE DIAGRAM - EAST BUILDING

NO SCALE



2 ONE-LINE DIAGRAM - WEST BUILDING

NO SCALE

Fault Current Calculations

Calculation Date: 03/07/2022

Maximum Available Fault Current (IAIC)
I SCA = (I AIC x M)
where M = 1 / (1 + f), and f = (√ (Phase) × L × I AIC) / (C × n × E)
(Note: Type "1/0" for 1/0AWG wire size, "2/0" for 2/0AWG, "3/0" for 3/0AWG, and "4/0" for 4/0AWG)

Point	Fault Location	Conductors Length, feet	Conductors size	# conductors per phase	Cu (1) Al (2)	Raceway Magnetic (1) Nonmagn. (2)	Voltage	Phase	"C" Value	Previous fault value	Fault value
A	At 300kVA Utility Transformer										52,000
B	At MDSE	95	400	3	2	2	208	3	18505	52,000	29,868
C	At Panel RDE	8	500	2	2	2	208	3	21390	29,868	28,541
D	At Nearest Load Center	25	"1/0"	1	2	1	208	1	5777	28,541	17,907
E	At Panel HPE	10	250	2	2	1	208	3	12122	29,868	27,089
F	At MDSW	160	400	3	2	2	208	3	18505	52,000	23,132
G	At Panel RDW	8	500	2	2	2	208	3	21390	23,132	22,328
H	At Nearest Load Center	25	"1/0"	1	2	1	208	1	5777	22,328	15,246
I	At Panel HPW	10	250	2	2	1	208	3	12122	23,132	21,429

Molded Case Circuit Breakers

Series Connected Short Circuit Ratings
240V Breaker (Continued)

Series Rating	Main Breaker		Branch Breaker			
kAIR	Max Amps	Type	P	Amps	Volts
42,000	225	QSHH (2P)	QPF2N	1	15-30	120
			QAF2N, QFGA2N	1	15-20	120
			QAFN	2	15-20	120/240
			BT, BTH	1	15-20	120/240
65,000	70 (1P) 125 (2P) 100 (3P)	HQP, HBQ, HB	QP, BQ, BL, QPH, BQH, BLH	1 2 3	15-70 15-125 15-100	120/240 240 240
			QPF, BLF, BQF, QE, BE, BLE, QPHF, BLHF, BQHF, QEH, BLEH, QPF2, QPF2N, BLF2, QPHF2, BLHF2	1	15-30	120
			QEH, BLEH, QE, QPHF, BLHF, BLE, QPF, BLF	2	15-60	120/240
			QT	1, 2	15-40	120/240
			QG, BG, BLG	1, 2	15-30	120/240
			BAF, QAF, BQAF, QAF2, QAF2N, BAF2, QAFH2, BAFH2, QFGA2, QFGA2N, BFGA2, QFGAH2, BFGAH2	1	15-20	120
			QAF, BAF, QAFN	2	15-20	120/240
	100 125	ED4 100 (1P) ED4, ED6 125 (2, 3P)	QP, BQ, BL,QPH, BQH, BLH	1 2 3	15-70 15-125 15-100	120/240 240 240
			QPF, BLF, BQF, QE, BE, BLE, QPHF, BLHF, BQHF, QEH, BLEH, QPF2, QPF2N, BLF2, QPHF2, BLHF2	1	15-30	120
			QEH, BLEH, QE, QPHF, BLHF, BLE, QPF, BLF	2	15-60	120/240
			QAF2, QAF2N, BAF2, BAF, QAF, BQAF, QAFH2, BAFH2, QAFH, BQAFH, BAFH, QFGA2, QFGA2N, BFGA2, QFGAH2, BFGAH2	1	15-20	120
			QAF, QAFN, BAF, QAFH, BAFH	2	15-20	120/240
			ED2	1,2,3	15-100	120/240
			QT	1,2	15-40	120/240
			BT, BTH	1	15-20	120/240
	125	SEAS (3VA) (2 & 3P)	QPH, BLH, BQH	1,2,3	15-125	120/240
			QAF2, QAF2N, BAF2, QAFH2, BAFH2, QFGA2, BFGA2, QFGAH2, QFGA2N, BFGAH2	1	15-20	120
			QPF2, QPF2N, BLF2, QPHF2, BLHF2	1	15-30	120

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FLOOR
DENVER, CO 80202
PH: 303.389.0095 | FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

ELECTRICAL ONE-LINE DIAGRAM

EG002

PLOT DATE: 3/23/2022 8:20:04 AM

COPYRIGHT©

DISTRIBUTION PANEL: MDSE

LOCATION: TRASH / RECYCLING B102
MAIN DEVICE: 800
MOUNTING: SURFACE
BUS AMPS: 800A
GROUND BUS: Yes
FEED: BOTTOM

VOLTAGE: 208/120 Wye V. 3 ø 4 W.
A.I.C. RATING: 85,000
GFP:
REMARKS: NEMA 3R

SECTION No. 1

CCT	POLES	RATING, A	LOAD, A	LOAD, VA	DESCRIPTION/NAMEPLATE
1	3	600	444	159,953	PANEL RDE - RESIDENTIAL LOADS
2	3	400	186	66,925	PANEL HPE - HOUSE LOADS
3	3	200	--	0	SOLAR SYSTEM (BY OTHERS)
4	3	--	--	--	SPACE
5	1	--	--	--	UNUSABLE SPACE
6	1	--	--	--	UNUSABLE SPACE

LOAD CLASSIFICATION	CONNECTED, VA	DEMAND	ESTIMATED, VA	PANEL TOTALS	
Lighting	729	125.00%	911	**PHASE A CONNECTED LOAD, VA:**	76,744
Receptacles	1,080	100.00%	1,080	**PHASE B CONNECTED LOAD, VA:**	74,297
Heating HVAC	19,887	100.00%	19,887	**PHASE C CONNECTED LOAD, VA:**	75,837
Electric Heat	3,000	100.00%	3,000	**TOTAL CONNECTED LOAD, VA:**	**226,878**
Other	163,543	100.00%	163,543	**TOTAL CONNECTED CURRENT, A:**	**630**
Continuous	38,640	125.00%	48,300	**PHASE A DEMAND LOAD, VA:**	80,073
				PHASE B DEMAND LOAD, VA:	77,520
				PHASE C DEMAND LOAD, VA:	79,127
				PHASE A DEMAND CURRENT, A:	669
				PHASE B DEMAND CURRENT, A:	646
				PHASE C DEMAND CURRENT, A:	661
				TOTAL EST. DEMAND LOAD, VA:	**236,720**
				TOTAL EST. DEMAND CURRENT, A:	**657**

NOTES:

DISTRIBUTION PANEL: MDSW

LOCATION: TRASH / RECYCLING B102
MAIN DEVICE: 800
MOUNTING: SURFACE
BUS AMPS: 800A
GROUND BUS: Yes
FEED: BOTTOM

VOLTAGE: 208/120 Wye V. 3 ø 4 W.
A.I.C. RATING: 85,000
GFP:
REMARKS: NEMA 3R

SECTION No. 1

CCT	POLES	RATING, A	LOAD, A	LOAD, VA	DESCRIPTION/NAMEPLATE
1	3	600	444	160,081	PANEL RDW - RESIDENTIAL LOADS
2	3	400	149	53,567	PANEL HPW - HOUSE LOADS
3	3	200	--	0	SOLAR SYSTEM (BY OTHERS)
4	3	--	--	--	SPACE
5	1	--	--	--	UNUSABLE SPACE
6	1	--	--	--	UNUSABLE SPACE

LOAD CLASSIFICATION	CONNECTED, VA	DEMAND	ESTIMATED, VA	PANEL TOTALS	
Lighting	676	125.00%	844	**PHASE A CONNECTED LOAD, VA:**	72,413
Receptacles	1,080	100.00%	1,080	**PHASE B CONNECTED LOAD, VA:**	71,220
Heating HVAC	19,887	100.00%	19,887	**PHASE C CONNECTED LOAD, VA:**	70,015
Electric Heat	3,000	100.00%	3,000	**TOTAL CONNECTED LOAD, VA:**	**213,648**
Other	164,046	100.00%	164,046	**TOTAL CONNECTED CURRENT, A:**	**593**
Continuous	24,960	125.00%	31,200	**PHASE A DEMAND LOAD, VA:**	74,585
				PHASE B DEMAND LOAD, VA:	73,356
				PHASE C DEMAND LOAD, VA:	72,115
				PHASE A DEMAND CURRENT, A:	623
				PHASE B DEMAND CURRENT, A:	613
				PHASE C DEMAND CURRENT, A:	601
				TOTAL EST. DEMAND LOAD, VA:	**220,057**
				TOTAL EST. DEMAND CURRENT, A:	**611**

NOTES:

PANELBOARD: HPE

LOCATION: TRASH / RECYCLING B102
MOUNTING: SURFACE NEMA 3R
MAIN DEVICE: 400MLO
BUS AMPS: 400A
FEED: BOTTOM

VOLTAGE: 208/120 Wye V. 3 ø 4 W.
A.I.C. RATING: 35,000
SPECIAL:

LOAD DESCRIPTION	BKR	P	CK T	A		B		C		CK T	P	BKR	LOAD DESCRIPTION
LIGHTING - EXT, RISER RM & CARPORT	20	1	1	327	3120					2	2	40	EV CHARGING STATION, EXTERIOR
LIGHTING - BLDG E, N. STAIRWELL	20	1	3			201	3120			4			
LIGHTING - BLDG E, S. STAIRWELL	20	1	5					201	3120	6	2	40	EV CHARGING STATION, EXTERIOR
RECEPTACLES - BLDG E, EXTERIOR	20	1	7	180	3120					8			
RECEPTACLE - BLDG E, RISER ROOM	20	1	9			180	3120			10	2	40	EV CHARGING STATION, EXTERIOR
RECEPTACLES - BLDG E, N. STAIRWELL	20	1	11					360	3120	12			
RECEPTACLES - BLDG E, S. STAIRWELL	20	1	13	360	1200					14	1	20	MONUMENT SIGN (FUTURE)
DCU - BLDG E, RISER ROOM	20	1	15			240	750			16	1	20	SNOWMELT - DOWNSPOUTS (GFP,L)
ECUH-5 - BLDG E, N. STAIRWELL, 1ST FLOOR (L)	20	3	17					1657	750	18	1	20	SNOWMELT - DOWNSPOUTS (GFP,L)
			19	1657	750					20	1	20	SNOWMELT - DOWNSPOUTS (GFP,L)
			21			1657	0			22	1	20	SPARE
ECUH-5 - BLDG E, N. STAIRWELL, 3RD FLOOR (L)	20	3	23					1657	0	24	1	20	SPARE
			25	1657	0					26	1	20	SPARE
			27			1657	0			28	1	20	SPARE
ECUH-5 - BLDG E, S. STAIRWELL, 1ST FLOOR (L)	20	3	29					1657	0	30	1	20	SPARE
			31	1657	--					32	1	--	SPACE
			33			1657	--			34	1	--	SPACE
ECUH-5 - BLDG E, S. STAIRWELL, 3RD FLOOR (L)	20	3	35					1657	--	36	1	--	SPACE
			37	1657	--					38	1	--	SPACE
			39			1657	--			40	1	--	SPACE
EH-1 - BLDG E, RISER ROOM	15	1	41					1500	--	42	1	--	SPACE
EH-1 - BLDG E, RISER ROOM	15	1	43	1500	--					44	1	--	SPACE
FIRE ALARM CONTROL PANEL (L)	20	1	45			500	--			46	1	--	SPACE
IRRIGATION CONTROLLER - BLDG E	20	1	47					600	--	48	1	--	SPACE
EV CHARGING STATION, EXTERIOR	40	2	49	3120	--					50	1	--	SPACE
			51			3120	--			52	1	--	SPACE
EV CHARGING STATION, EXTERIOR	40	2	53					3120	--	54	1	--	SPACE
			55	3120	--					56	1	--	SPACE
EV CHARGING STATION, EXTERIOR	40	2	57			3120	--			58	1	--	SPACE
			59					3120	--	60	1	--	SPACE
TOTAL LOAD , VA:				23,426		20,980		22,520					
TOTAL CURRENT, A:				197		175		190					
DEMAND LOAD, VA:				26,871		24,065		25,831					
DEMAND CURRENT, A:				226		201		218					

LOAD CLASSIFICATION	CONNECTED	DEMAND	ESTIMATED	PANEL TOTALS	
Continuous	38,640	125.00%	48,300		
Electric Heat	3,000	100.00%	3,000	**TOTAL CONNECTED LOAD, VA:**	66,925
Heating HVAC	19,887	100.00%	19,887	**TOTAL CONNECTED CURRENT, A:**	186
Lighting	729	125.00%	911	**TOTAL EST. DEMAND LOAD, VA:**	76,767
Other	3,590	100.00%	3,590	**TOTAL EST. DEMAND CURRENT, A:**	213
Receptacles	1,080	100.00%	1,080		

NOTES:
"L" INDICATES THAT LOCKABLE MEANS COMPLIANT WITH NEC ARTICLE 110.25 TO BE PROVIDED. "GFP" IN THE CIRCUIT BREAKER DESCRIPTION REFERS TO GFPE-TYPE CIRCUIT BREAKER TO BE INSTALLED.

PANELBOARD: HPW

LOCATION: TRASH / RECYCLING B102
MOUNTING: SURFACE NEMA 3R
MAIN DEVICE: 400MLO
BUS AMPS: 400A
FEED: BOTTOM

VOLTAGE: 208/120 Wye V. 3 ø 4 W.
A.I.C. RATING: 35,000
SPECIAL:

LOAD DESCRIPTION	BKR	P	CK T	A		B		C		CK T	P	BKR	LOAD DESCRIPTION
LIGHTING - EXT & RISER & BIKE RM	20	1	1	274	3120					2	2	40	EV CHARGING STATION, EXTERIOR
LIGHTING - BLDG W, E. STAIRWELL	20	1	3			201	3120			4			
LIGHTING - BLDG W, W. STAIRWELL	20	1	5					201	375	6	1	20	SNOWMELT - DOWNSPOUTS (GFP,L)
RECEPTACLES - BLDG W, EXTERIOR	20	1	7	180	750					8	1	20	SNOWMELT - DOWNSPOUTS (GFP,L)
RECEPTACLE - BLDG W, RISER ROOM	20	1	9			180	750			10	1	20	SNOWMELT - DOWNSPOUTS (GFP,L)
RECEPTACLES - BLDG W, E. STAIRWELL	20	1	11					360	750	12	1	20	SNOWMELT - DOWNSPOUTS (GFP,L)
RECEPTACLES - BLDG W, W....	20	1	13	360	0					14	1	20	SPARE
DCU - BLDG W, RISER ROOM	20	1	15			240	0			16	1	20	SPARE
ECUH-5 - BLDG W, E. STAIRWELL, 1ST FLOOR (L)	20	3	17					1657	0	18	1	20	SPARE
			19	1657	0					20	1	20	SPARE
			21			1657	0			22	1	20	SPARE
ECUH-5 - BLDG W, E. STAIRWELL, 3RD FLOOR (L)	20	3	23					1657	--	24	1	--	SPACE
			25	1657	--					26	1	--	SPACE
			27			1657	--			28	1	--	SPACE
ECUH-5 - BLDG W, W. STAIRWELL, 1ST FLOOR (L)	20	3	29					1657	--	30	1	--	SPACE
			31	1657	--					32	1	--	SPACE
			33			1657	--			34	1	--	SPACE
ECUH-5 - BLDG W, W. STAIRWELL, 3RD FLOOR (L)	20	3	35					1657	--	36	1	--	SPACE
			37	1657	--					38	1	--	SPACE
			39			1657	--			40	1	--	SPACE
EH-1 - BLDG W, RISER ROOM	15	1	41					1500	--	42	1	--	SPACE
EH-1 - BLDG W, RISER ROOM	15	1	43	1500	--					44	1	--	SPACE
FIRE ALARM CONTROL PANEL (L)	20	1	45			500	--			46	1	--	SPACE
IRRIGATION CONTROLLER - BLDG W	20	1	47					600	--	48	1	--	SPACE
EV CHARGING STATION, EXTERIOR	40	2	49	3120	--					50	1	--	SPACE
			51			3120	--			52	1	--	SPACE
EV CHARGING STATION, EXTERIOR	40	2	53					3120	--	54	1	--	SPACE
			55	3120	--					56	1	--	SPACE
EV CHARGING STATION, EXTERIOR	40	2	57			3120	--			58	1	--	SPACE
			59					3120	--	60	1	--	SPACE
TOTAL LOAD , VA:				19,053		17,860		16,655					
TOTAL CURRENT, A:				160		150		139					
DEMAND LOAD, VA:				21,332		19,996		18,647					
DEMAND CURRENT, A:				179		168		155					

LOAD CLASSIFICATION	CONNECTED	DEMAND	ESTIMATED	PANEL TOTALS	
Continuous	24,960	125.00%	31,200		
Electric Heat	3,000	100.00%	3,000	**TOTAL CONNECTED LOAD, VA:**	53,567
Heating HVAC	19,887	100.00%	19,887	**TOTAL CONNECTED CURRENT, A:**	149
Lighting	676	125.00%	844	**TOTAL EST. DEMAND LOAD, VA:**	59,976
Other	3,965	100.00%	3,965	**TOTAL EST. DEMAND CURRENT, A:**	166
Receptacles	1,080	100.00%	1,080		

NOTES:
"L" INDICATES THAT LOCKABLE MEANS COMPLIANT WITH NEC ARTICLE 110.25 TO BE PROVIDED. "GFP" IN THE CIRCUIT BREAKER DESCRIPTION REFERS TO GFPE-TYPE CIRCUIT BREAKER TO BE INSTALLED.

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, COLORADO 80202
PH: 303.389.0095 | FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

ELECTRICAL SCHEDULES

EG003

PLOT DATE: 3/23/2022 8:20:08 AM

COPYRIGHT©

PANELBOARD: RDE

LOCATION: TRASH / RECYCLING B102
MOUNTING: SURFACE NEMA 3R
MAIN DEVICE: 600MLO
BUS AMPS: 600A
FEED: BOTTOM
VOLTAGE: 208/120 WyeV/3 ø 4 W.
A.I.C. RATING: 35,000
SPECIAL:

LOAD DESCRIPTION	BKR	P	CKT	A	B	C	CKT	P	BKR	LOAD DESCRIPTION
LC1(E101)	125	2	1	...	...		2	2	125	LC2(E102)
			3		...	...	4			
LC2(E103)	125	2	5			...	6	2	125	LC1(E104)
			7	...	...		8			
LC1(E201)	125	2	9		0	0	10	2	125	LC2(E202)
			11			0	12			
LC2(E203)	125	2	13	0	0		14	2	125	LC1(E204)
			15		0	0	16			
LC3(E301)	125	2	17			...	18	2	125	LC3(E302)
			19	...	...		20			
LC3(E303)	125	2	21		...	--	22	1	--	SPACE
			23			...	24	1	--	SPACE
SUBMETERS VOLTAGE LEADS	20	3	25	0	--		26	1	--	SPACE
			27		0	--	28	1	--	SPACE
			29			0	-- 30	1	--	SPACE

NOTES:
THIS RESIDENTIAL PANEL SCHEDULE IS SHOWN TO INDICATE THE CONNECTED RESIDENTIAL UNITS AND FEEDER CIRCUIT BREAKER SIZES. REFER TO RESIDENTIAL LOAD CALCULATIONS ON SHEET EG002 FOR UNIT CALCULATIONS. REFER TO TYPICAL UNIT PLANS FOR LOAD CENTER CONFIGURATIONS.

PANELBOARD: RDW

LOCATION: TRASH / RECYCLING B102
MOUNTING: SURFACE NEMA 3R
MAIN DEVICE: 600MLO
BUS AMPS: 600A
FEED: BOTTOM
VOLTAGE: 208/120 WyeV/3 ø 4 W.
A.I.C. RATING: 35,000
SPECIAL:

LOAD DESCRIPTION	BKR	P	CKT	A	B	C	CKT	P	BKR	LOAD DESCRIPTION
LC1(W101)	125	2	1	...	...		2	2	125	LC2(W102)
			3		...	...	4			
LC2(W103)	125	2	5			0	... 6	2	125	LC2(W104)
			7	0	...		8			
LC1(W201)	125	2	9		0	0	10	2	125	LC2(W202)
			11			0	0	12		
LC2(W203)	125	2	13	0	...		14	2	125	LC2(W204)
			15		0	...	16			
LC2(W301)	125	2	17			...	0	18	2	125	LC3(W302)
			19	...	0		20			
LC3(W303)	125	2	21		0	--	22	1	--	SPACE
			23			0	--	24	1	--	SPACE
SUBMETERS VOLTAGE LEADS	20	3	25	0	--		26	1	--	SPACE
			27		0	--	28	1	--	SPACE
			29			0	-- 30	1	--	SPACE

NOTES:
THIS RESIDENTIAL PANEL SCHEDULE IS SHOWN TO INDICATE THE CONNECTED RESIDENTIAL UNITS AND FEEDER CIRCUIT BREAKER SIZES. REFER TO RESIDENTIAL LOAD CALCULATIONS ON SHEET EG002 FOR UNIT CALCULATIONS. REFER TO TYPICAL UNIT PLANS FOR LOAD CENTER CONFIGURATIONS.

MECHANICAL EQUIPMENT SCHEDULE

TAG	DESCRIPTION	MOTOR, HP	LOAD, A	VA	VOLTS	PH	OCPD SIZE	BRANCH CIRCUIT CONDUCTORS	SPECIFIC NOTES
BF-1	BOOSTER FAN	0.25	5.8	696	120	1	15	(2-12 & 1-12GND)	1
DCP-1	CIRCULATING PUMP	0.17	4.4	528	120	1	15	(2-12 & 1-12GND)	2
ECUH-5	CABINET UNIT HEATER	-	13.8	4,972	208	3	20	(3-12 & 1-12GND)	
EF-1	BATHROOM EXHAUST FAN	-	0.4	47	120	1	15	(2-12 & 1-12GND)	
EF-2	BATHROOM EXHAUST FAN	-	0.4	47	120	1	15	(2-12 & 1-12GND)	
EH-1	RECESSED WALL HEATER	-	12.5	1,500	120	1	20	(2-12 & 1-12GND)	
HEWH-1	ELECTRIC WATER HEATER	-	21.6	4,500	208	1	30	(2-10 & 1-10GND)	1
VTAC-1	SINGLE PACKAGE VERTICAL AIR CONDITIONER	-	25	5,200	208	1	35	(2-8 & 1-10GND)	
VTAC-2	SINGLE PACKAGE VERTICAL AIR CONDITIONER	-	32	6,656	208	1	50	(2-6 & 1-10GND)	
VTAC-3	SINGLE PACKAGE VERTICAL AIR CONDITIONER	-	33	6,864	208	1	50	(2-6 & 1-10GND)	

GENERAL NOTES
1. ELECTRICAL CONTRACTOR SHALL OBTAIN A COPY OF THE MECHANICAL AND PLUMBING EQUIPMENT SUBMITTALS TO COMPARE AGAINST CURRENT MECHANICAL EQUIPMENT SCHEDULE. REPORT ANY DISCREPANCIES TO ELECTRICAL ENGINEER FOR VERIFICATION OF THE EQUIPMENT SELECTION AND REQUIRED REVISION OF THE DRAWINGS OR SCHEDULES.
2. FIELD VERIFY EQUIPMENT NAMEPLATES AND MANUALS AGAINST PARAMETERS SHOWN ON THIS SCHEDULE. IF SIGNIFICANT DISCREPANCIES OCCUR, CONTACT ELECTRICAL ENGINEER FOR REQUIRED REVISION OF THE DRAWINGS.
3. COORDINATE EXACT EQUIPMENT LOCATIONS AND ADDITIONAL INSTALLATION REQUIREMENTS WITH MECHANICAL/PLUMBING CONTRACTOR PRIOR TO ROUGH-IN.
4. EQUIPMENT DISCONNECTS SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR, UNLESS FURNISHED BY MANUFACTURER OR PROVIDED BY MECHANICAL CONTRACTOR. REFER TO MECHANICAL AND PLUMBING DRAWINGS FOR SCOPE OF THE EQUIPMENT SUPPLIED BY MECHANICAL AND ELECTRICAL CONTRACTORS.
5. CONTROL PANEL SHORT CIRCUIT RATING SHALL BE INDICATED ON THE FACTORY INSTALLED LABEL AND SHALL BE ADEQUATE FOR THESE INSTALLATION CONDITIONS.

SPECIFIC NOTES:
1. INTERLOCK BF-1 AND HEWH-1. COORDINATE WITH MECHANICAL AND PLUMBING CONTRACTORS PRIOR TO ROUGH-IN.
2. PRIOR TO PERFORMING ANY WORK, VERIFY WITH PLUMBING CONTRACTOR IF DCP-1 IS NEEDED IN THE RESIDENTIAL UNIT HEWH-1 CLOSETS. PROVIDE 120V CIRCUIT IN RESIDENTAIL UNIT LOAD CENTERS AS REQUIRED.

LUMINAIRE SCHEDULE

TYPE	DESCRIPTION	LAMPS	DIMMING TYPE	MOUNTING	LOAD, VA	VOLTS	MANUFACTURER	CATALOG NUMBER	SPECIFIC NOTES
					0	0			
A	4' LINEAR LED STRIP WITH BATTERY BACKUP	LED, 3000K, 82CRI, 4000LM	0-10V 1%	SURFACE/SUSPENDED	40	120	LITHONIA LIGHTING	WL4-40L-EZ1-LP830-DIM50-EL14L	1
B	4' LINEAR LED STRIP	LED, 3000K, 80CRI, 4000LM	0-10V 1%	SURFACE/SUSPENDED	28	120	LITHONIA LIGHTING	CLX-L48-4000LM-SEF-L/LENS-WD-MVOLT-EZ1-30K-80CRI	1
E-B1	LINEA 37" LED BOLLARD	LED, 3000K, 80CRI, 568LM	-	GROUND	16	120	HESS AMERICA	LN950-LED-WW-A-UNV-03SRA	
E-DS1	EXTERIOR LED SCONCE	LED, 3000K, 80CRI, 2100LM	-	SURFACE	18	120	LIGMAN LIGHTING	UCI-18W-T3-W30-*-120/277V	1
E-DS2	EXTERIOR LED SCONCE	LED, 3000K, 90CRI, 391LM	-	SURFACE	18	120	MODERN FORMS	WS-W38610	1
E-LS1	2-FOOT EXTERIOR LED LINEAR STRIP (15W)	LED, 3000K, 82CRI, 1206LM	-	SURFACE	15	120	LUMINAIRE LED	VPF4-2FT-MIN10-15W-30K-MVOLT-CLP-*	1
E-LS2	2-FOOT EXTERIOR LED LINEAR STRIP (20W)	LED, 3000K, 82CRI, 2189LM	-	SURFACE	20	120	LUMINAIRE LED	VPF4-2FT-MIN10-20W-30K-MVOLT-CLP-*	1
EX	WHITE THERMOPLASTIC EXIT SIGN WITH GREEN LETTERS WITH REMOTE HEAD AND BATTERY BACKUP	LED	-	RECESSED/SURFACE	0.75	120	LITHONIA LIGHTING	LHQM-LED-*-G-HO RO / ELMRW-LP220L*-SGL	4
RU1	DECORATIVE PENDANT	LED, 3000K, 90CRI, 1000LM	TRIAC	SUSPENDED	12	120	BASELITE	UDC14 * * * *12W 3K LDM120	2
RU2	SURFACE MOUNT DOWNLIGHT	LED, 3000K, 90CRI, 700LM	ELV	SURFACE	10	120	ACUITY BRANDS / JUNO	JSF-SIN-07LM-30K-90CRI-120-FRPC-WH	
RU3	VANITY FIXTURE	LED, 3000K, 90CRI, 1317LM	ELV	WALL	24	120	MODERN FORMS	WS-38826 *	1
RU4	CEILING FAN WITH LIGHT KIT	LED, 3000K, 90CRI, 708LM	DIM	SUSPENDED	36	120	MODERN FORMS	FR-W1803-44L * *	3

GENERAL NOTE:
1. VERIFY FIXTURE CATALOG NUMBER, FINISH, LENGTH, LAMPS SELECTION, AND ADDITIONAL INSTALLATION REQUIREMENTS WITH ARCHITECT/OWNER PRIOR TO ORDERING.
2. LIGHT FIXTURE SUBSTITUTIONS OF EQUAL QUALITY AND PERFORMANCE WILL BE ACCEPTED WITH PRIOR OWNER/ARCHITECT APPROVAL.
3. COORDINATE DIMMING TYPE AND DIMMERS COMPATIBILITY WITH FIXTURE PROVIDER. NO SHARED NEUTRAL IS ALLOWED FOR DIMMING SWITCH LEGS.
4. DIMMING TYPE SHOWN AS "DIM" INDICATES THAT FIXTURE IS DIMMABLE, BUT ENGINEER HAS NO INFORMATION ABOUT USED TYPE OF DIMMING.
5. SYMBOL "*" IN CATALOG NUMBER INDICATES OPTIONS, TRIM, FINISH, AND COLOR SELECTIONS TO BE COORDINATED WITH ARCHITECT OR OWNER.

SPECIFIC NOTES:
1. FINISH TBD BY ARCHITECT.
2. FINISH AND MOUNTING TBD BY ARCHITECT.
3. HOUSING AND BLADE TBD BY ARCHITECT.
4. HOUSING COLOR TBD BY ARCHITECT.

LOAD CENTER: LC1(E104)

LOCATION:
MOUNTING: RECESSED NEMA1
MAIN DEVICE: 125 MLO
BUS AMPS: 125 AMPS
VOLTAGE: 208/120 Single V. 1 ø 3 W.
A.I.C. RATING: SERIES RATING
SPECIAL:

LOAD DESCRIPTION	BKR	P	CKT	A	C	CKT	P	BKR	LOAD DESCRIPTION
LIGHTING, SMOKE DETECTORS, EF-1 & EF-2 (AFCI)	15	1	1	...	...	2	1	20	WASHER (AFCI/GFCI)
RECEPTACLES - GENERAL (AFCI)	15	1	3		...	4	2	30	DRYER (GFCI)
RECEPTACLES - KITCHEN (AFCI/GFCI)	20	1	5	...	...	6			
RECEPTACLES - KITCHEN (AFCI/GFCI)	20	1	7		...	8	1	15	BF-1 (AFCI)
DISHWASHER/DISPOSAL (AFCI/GFCI)	20	1	9	...	...	10	2	30	HEWH-1 (L)
REFRIGERATOR (AFCI/GFCI)	15	1	11		...	12			
MICROWAVE/HOOD (AFCI/GFCI)	20	1	13	...	...	14	2	50	VTAC-3 (L)
RANGE (GFCI)	50	2	15		...	16			
			17	...	...	18	1	15	RECEPTACLES - GENERAL (AFCI)
RECEPTACLE - BATHROOM (AFCI/GFCI)	20	1	19		...	-- 20	1	--	SPACE
RECEPTACLES - GENERAL (AFCI)	15	1	21	...	0	22	2	20	SPD
RECEPTACLE - BATHROOM (AFCI/GFCI)	20	1	23		...	0 24			

NOTES:
"AFCI" IN CIRCUIT DESCRIPTION REFERS TO AFCI-TYPE AND "GFCI" REFERS TO GFCI-TYPE CIRCUIT BREAKER TO BE INSTALLED. "AFCI/GFCI" REFERS TO COMBINATION AFCI/GFCI CIRCUIT BREAKER TO BE INSTALLED.

LOAD CENTER: LC2(E103)

LOCATION:
MOUNTING: RECESSED NEMA1
MAIN DEVICE: 125 MLO
BUS AMPS: 125 AMPS
VOLTAGE: 208/120 Single V. 1 ø 3 W.
A.I.C. RATING: SERIES RATING
SPECIAL:

LOAD DESCRIPTION	BKR	P	CKT	A	C	CKT	P	BKR	LOAD DESCRIPTION
LIGHTING, SMOKE DETECTORS, EF-1 & EF-2 (AFCI)	15	1	1	...	...	2	1	20	WASHER (AFCI/GFCI)
RECEPTACLES - GENERAL (AFCI)	15	1	3		...	4	2	30	DRYER (GFCI)
RECEPTACLES - KITCHEN (AFCI/GFCI)	20	1	5	...	...	6			
RECEPTACLES - KITCHEN (AFCI/GFCI)	20	1	7		...	8	1	15	BF-1 (AFCI)
DISHWASHER/DISPOSAL (AFCI/GFCI)	20	1	9	...	...	10	2	30	HEWH-1 (L)
REFRIGERATOR (AFCI/GFCI)	15	1	11		...	12			
MICROWAVE/HOOD (AFCI)	20	1	13	...	...	14	2	50	VTAC-2 (L)
RANGE (GFCI)	50	2	15		...	16			
			17	...	--	18	1	--	SPACE
RECEPTACLE - BATHROOM (AFCI/GFCI)	20	1	19		...	-- 20	1	--	SPACE
RECEPTACLES - GENERAL (AFCI)	15	1	21	...	0	22	2	20	SPD
SPACE	--	1	23		--	0 24			

NOTES:
"AFCI" IN CIRCUIT DESCRIPTION REFERS TO AFCI-TYPE AND "GFCI" REFERS TO GFCI-TYPE CIRCUIT BREAKER TO BE INSTALLED. "AFCI/GFCI" REFERS TO COMBINATION AFCI/GFCI CIRCUIT BREAKER TO BE INSTALLED.

LOAD CENTER: LC3(E303)

LOCATION: UNIT TYPE S.2 E303
MOUNTING: RECESSED NEMA1
MAIN DEVICE: 125 MLO
BUS AMPS: 125 AMPS
VOLTAGE: 208/120 Single V. 1 ø 3 W.
A.I.C. RATING: SERIES RATING
SPECIAL:

LOAD DESCRIPTION	BKR	P	CKT	B	C	CKT	P	BKR	LOAD DESCRIPTION
LIGHTING, SMOKE DETECTORS, EF-1 & EF-2 (AFCI)	15	1	1	...	...	2	1	20	WASHER (AFCI/GFCI)
RECEPTACLES - GENERAL (AFCI)	15	1	3		...	4	2	30	DRYER (GFCI)
RECEPTACLES - KITCHEN (AFCI/GFCI)	20	1	5	...	...	6			
RECEPTACLES - KITCHEN (AFCI/GFCI)	20	1	7		...	8	1	15	BF-1 (AFCI)
DISHWASHER/DISPOSAL (AFCI/GFCI)	20	1	9	...	...	10	2	30	HEWH-1 (L)
REFRIGERATOR (AFCI/GFCI)	15	1	11		...	12			
MICROWAVE/HOOD (AFCI/GFCI)	20	1	13	...	...	14	2	35	VTAC-1 (L)
RANGE (GFCI)	50	2	15		...	16			
			17	...	--	18	1	--	SPACE
RECEPTACLE - BATHROOM (AFCI/GFCI)	20	1	19		...	-- 20	1	--	SPACE
SPACE	--	1	21	--	0	22	2	20	SPD
SPACE	--	1	23		--	0 24			

NOTES:
"AFCI" IN CIRCUIT DESCRIPTION REFERS TO AFCI-TYPE AND "GFCI" REFERS TO GFCI-TYPE CIRCUIT BREAKER TO BE INSTALLED. "AFCI/GFCI" REFERS TO COMBINATION AFCI/GFCI CIRCUIT BREAKER TO BE INSTALLED.

OCCUPANCY SENSOR SCHEDULE

TYPE	DESCRIPTION	MANUF.	MODEL	SPECIFIC NOTES
1	LOW VOLTAGE DUAL TECHNOLOGY CEILING-MOUNTED OCCUPANCY SENSOR (EXTENDED RANGE 360 DEGREE)	ACUITY CONTROLS	NCM-PDT-10-RJB-LT	
LC	20-AMP 4-POLE CONTACTOR	WATTSTOPPER	C115NC	
LV	LOW VOLTAGE ON/OFF DIMMING WALLPOD	ACUITY CONTROLS	NPODM-*	
P1	ON/OFF POWER/RELAY PACK (16A)	ACUITY CONTROLS	NPP16-EFP	
TS	ASTRONOMICAL TIMER SWITCH	WATTSTOPPER	RT-200	1

GENERAL NOTES
1. VERIFY DEVICE SELECTION, CATALOG NUMBER, FINISH, AND ADDITIONAL INSTALLATION REQUIREMENTS WITH OWNER, ARCHITECT, AND LOCAL MANUFACTURER REPRESENTATIVE PRIOR TO ORDERING.
2. SENSOR REQUIRES POWERPACK.

SEQUENCE OF OPERATIONS FOR LIGHTING CONTROLS

SPACE TYPE	OCCUPANCY SENSOR					WALL SWITCH				TIME CLOCK				DAYLIGHT SENSOR					SPECIFIC NOTES
	VACANCY MODE (MANUAL ON)	OCCUPANCY MODE (AUTO ON)	AUTO ON INITIAL LIGHT LEVEL (%)	VACANT LIGHT LEVEL (%)	SENSOR TIME OUT (MIN)	ON/OFF ONLY	DIMMER SWITCH KEY SWITCH	SCENES SELECTOR/KEYPAD TOUCH PANEL		SCHEDULED ON AT	SCHEDULED OFF AT	OVERRIDE SWITCH	BLINK WARN (Y/N)	ASTRONOMIC	INDOOR ON/OFF ONLY	INDOOR DIMMING	EXTERIOR PHOTOCELL	EMERGENCY 24/7	
BIKE STORAGE AREA		●			15	●													
STAIRWELLS		●	100	50															
SITE LIGHTING										DUSK	DAWN	●		●			●		1

SPECIFIC NOTES:
1. COORDINATE WITH CLIENT IF PHOTOCELL "ON" OR "OFF" OVERRIDE WILL BE NEEDED.

PLOT DATE: 3/23/2022 8:20:12 AM

COPYRIGHT©

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, CO 80202
PH: 303.389.0095 | FAX: 303.389.8098
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

ELECTRICAL SCHEDULES

EG004

FEEDERS AND BRANCH CIRCUITS SCHEDULE

PANEL	CIRCUIT	LOAD DESCRIPTION	VOLTS	POLES	LOAD, A	OCPD, A	CONDUCTORS	TYPE	LENGTH, FT	VOLTAGE DROP, %	VOLTAGE DROP, V
HPE											
HPE	1	LIGHTING - EXT, RISER RM & CARPORT	120	1	2.7	20	1-#12, 1-#12, 1-#12GND	CU 60 N	216	2.0	2.4
HPE	2,4	EV CHARGING STATION, EXTERIOR	208	2	30.0	40	2-#6, 1-#6GND	CU 60	142	2.0	4.2
HPE	3	LIGHTING - BLDG E, N. STAIRWELL	120	1	1.7	20	1-#12, 1-#12, 1-#12GND	CU 60 N	84	0.5	0.6
HPE	5	LIGHTING - BLDG E, S. STAIRWELL	120	1	1.7	20	1-#12, 1-#12, 1-#12GND	CU 60 N	136	0.8	0.9
HPE	6,8	EV CHARGING STATION, EXTERIOR	208	2	30.0	40	2-#6, 1-#6GND	CU 60	169	2.4	5.0
HPE	7	RECEPTACLES - BLDG E, EXTERIOR	120	1	1.5	20	1-#12, 1-#12, 1-#12GND	CU 60 N	16	0.1	0.1
HPE	9	RECEPTACLE - BLDG E, RISER ROOM	120	1	1.5	20	1-#12, 1-#12, 1-#12GND	CU 60 N	91	0.5	0.5
HPE	10,12	EV CHARGING STATION, EXTERIOR	208	2	30.0	40	2-#6, 1-#6GND	CU 60	169	2.4	5.0
HPE	11	RECEPTACLES - BLDG E, N. STAIRWELL	120	1	3.0	20	1-#12, 1-#12, 1-#12GND	CU 60 N	74	0.7	0.9
HPE	13	RECEPTACLES - BLDG E, S. STAIRWELL	120	1	3.0	20	1-#12, 1-#12, 1-#12GND	CU 60 N	127	1.3	1.5
HPE	14	MONUMENT SIGN (FUTURE)	120	1	10.0	20	1-#8, 1-#8, 1-#8GND	CU 60 N	169	2.2	2.6
HPE	15	DCU - BLDG E, RISER ROOM	120	1	2.0	20	1-#12, 1-#12, 1-#12GND	CU 60 N	94	0.6	0.8
HPE	16	SNOWMELT - DOWNSPOUTS (GFP,L)	120	1	6.3	20	1-#12, 1-#12, 1-#12GND	CU 60 N	126	2.6	3.2
HPE	17,19,21	ECUH-5 - BLDG E, N. STAIRWELL, 1ST FLOOR (L)	208	3	13.8	20	3-#12, 1-#12GND	CU 60	54	1.2	2.6
HPE	18	SNOWMELT - DOWNSPOUTS (GFP,L)	120	1	6.3	20	1-#10, 1-#10, 1-#10GND	CU 60 N	178	2.2	2.7
HPE	20	SNOWMELT - DOWNSPOUTS (GFP,L)	120	1	6.3	20	1-#12, 1-#12, 1-#12GND	CU 60 N	120	2.5	3.0
HPE	23,25,27	ECUH-5 - BLDG E, N. STAIRWELL, 3RD FLOOR (L)	208	3	13.8	20	3-#12, 1-#12GND	CU 60	69	1.6	3.3
HPE	29,31,33	ECUH-5 - BLDG E, S. STAIRWELL, 1ST FLOOR (L)	208	3	13.8	20	3-#12, 1-#12GND	CU 60	106	2.4	5.1
HPE	35,37,39	ECUH-5 - BLDG E, S. STAIRWELL, 3RD FLOOR (L)	208	3	13.8	20	3-#12, 1-#12GND	CU 60	121	2.8	5.8
HPE	41	EH-1 - BLDG E, RISER ROOM	120	1	12.5	15	1-#10, 1-#10, 1-#10GND	CU 60 N	85	2.1	2.6
HPE	43	EH-1 - BLDG E, RISER ROOM	120	1	12.5	15	1-#10, 1-#10, 1-#10GND	CU 60 N	93	2.3	2.8
HPE	45	FIRE ALARM CONTROL PANEL (L)	120	1	4.2	20	1-#12, 1-#12, 1-#12GND	CU 60 N	88	1.2	1.5
HPE	47	IRRIGATION CONTROLLER - BLDG E	120	1	5.0	20	1-#12, 1-#12, 1-#12GND	CU 60 N	89	1.5	1.8
HPE	49,51	EV CHARGING STATION, EXTERIOR	208	2	30.0	40	2-#8, 1-#10GND	CU 60	85	1.9	4.0
HPE	53,55	EV CHARGING STATION, EXTERIOR	208	2	30.0	40	2-#8, 1-#10GND	CU 60	86	1.9	4.0
HPE	57,59	EV CHARGING STATION, EXTERIOR	208	2	30.0	40	2-#6, 1-#6GND	CU 60	142	2.0	4.2
HPW											
HPW	1	LIGHTING - EXT & RISER & BIKE RM	120	1	2.3	20	1-#12, 1-#12, 1-#12GND	CU 60 N	168	1.3	1.5
HPW	2,4	EV CHARGING STATION, EXTERIOR	208	2	30.0	40	2-#8, 1-#10GND	CU 60	123	2.8	5.7
HPW	3	LIGHTING - BLDG W, E. STAIRWELL	120	1	1.7	20	1-#12, 1-#12, 1-#12GND	CU 60 N	133	0.7	0.9
HPW	5	LIGHTING - BLDG W, W. STAIRWELL	120	1	1.7	20	1-#12, 1-#12, 1-#12GND	CU 60 N	81	0.5	0.5
HPW	6	SNOWMELT - DOWNSPOUTS (GFP,L)	120	1	3.1	20	1-#12, 1-#12, 1-#12GND	CU 60 N	57	0.6	0.7
HPW	7	RECEPTACLES - BLDG W, EXTERIOR	120	1	1.5	20	1-#12, 1-#12, 1-#12GND	CU 60 N	13	0.1	0.1
HPW	8	SNOWMELT - DOWNSPOUTS (GFP,L)	120	1	6.3	20	1-#12, 1-#12, 1-#12GND	CU 60 N	111	2.3	2.8
HPW	9	RECEPTACLE - BLDG W, RISER ROOM	120	1	1.5	20	1-#12, 1-#12, 1-#12GND	CU 60 N	72	0.4	0.4
HPW	10	SNOWMELT - DOWNSPOUTS (GFP,L)	120	1	6.3	20	1-#10, 1-#10, 1-#10GND	CU 60 N	175	2.2	2.6
HPW	11	RECEPTACLES - BLDG W, E. STAIRWELL	120	1	3.0	20	1-#12, 1-#12, 1-#12GND	CU 60 N	123	1.2	1.5
HPW	12	SNOWMELT - DOWNSPOUTS (GFP,L)	120	1	6.3	20	1-#12, 1-#12, 1-#12GND	CU 60 N	132	2.7	3.3
HPW	13	RECEPTACLES - BLDG W, W. STAIRWELL	120	1	3.0	20	1-#12, 1-#12, 1-#12GND	CU 60 N	71	0.7	0.9
HPW	15	DCU - BLDG W, RISER ROOM	120	1	2.0	20	1-#12, 1-#12, 1-#12GND	CU 60 N	66	0.4	0.5
HPW	17,19,21	ECUH-5 - BLDG W, E. STAIRWELL, 1ST FLOOR (L)	208	3	13.8	20	3-#12, 1-#12GND	CU 60	104	2.4	5.0
HPW	23,25,27	ECUH-5 - BLDG W, E. STAIRWELL, 3RD FLOOR (L)	208	3	13.8	20	3-#12, 1-#12GND	CU 60	113	2.6	5.4
HPW	29,31,33	ECUH-5 - BLDG W, W. STAIRWELL, 1ST FLOOR (L)	208	3	13.8	20	3-#12, 1-#12GND	CU 60	51	1.2	2.5
HPW	35,37,39	ECUH-5 - BLDG W, W. STAIRWELL, 3RD FLOOR (L)	208	3	13.8	20	3-#12, 1-#12GND	CU 60	62	1.4	2.9
HPW	41	EH-1 - BLDG W, RISER ROOM	120	1	12.5	15	1-#12, 1-#12, 1-#12GND	CU 60 N	71	3.0	3.5
HPW	43	EH-1 - BLDG W, RISER ROOM	120	1	12.5	15	1-#12, 1-#12, 1-#12GND	CU 60 N	63	2.6	3.1
HPW	45	FIRE ALARM CONTROL PANEL (L)	120	1	4.2	20	1-#12, 1-#12, 1-#12GND	CU 60 N	60	0.8	1.0
HPW	47	IRRIGATION CONTROLLER - BLDG W	120	1	5.0	20	1-#12, 1-#12, 1-#12GND	CU 60 N	73	1.2	1.5
HPW	49,51	EV CHARGING STATION, EXTERIOR	208	2	30.0	40	2-#8, 1-#10GND	CU 60	68	1.5	3.2
HPW	53,55	EV CHARGING STATION, EXTERIOR	208	2	30.0	40	2-#8, 1-#10GND	CU 60	69	1.5	3.2
HPW	57,59	EV CHARGING STATION, EXTERIOR	208	2	30.0	40	2-#8, 1-#10GND	CU 60	122	2.8	5.7
MDSE											
MDSE	1	PANEL RDE - RESIDENTIAL LOADS	208	3	444.0	600	2 runs of 3-#500, 1-#500, 1-#2/0GND	AL 75 N	24	0.1	0.3
MDSE	2	PANEL HPE - HOUSE LOADS	208	3	185.8	400	2 runs of 3-#250, 1-#250, 1-#1GND	AL 75 N	21	0.1	0.2
MDSW											
MDSW	1	PANEL RDW - RESIDENTIAL LOADS	208	3	444.3	600	2 runs of 3-#500, 1-#500, 1-#2/0GND	AL 75 N	22	0.1	0.2
MDSW	2	PANEL HPW - HOUSE LOADS	208	3	148.7	400	2 runs of 3-#250, 1-#250, 1-#1GND	AL 75 N	14	0.0	0.1

GENERAL NOTES:

1. THIS SCHEDULE IS SHOWN TO INDICATE THE RECOMMENDED CONDUCTOR SIZES FOR THE FEEDERS AND BRANCH CIRCUITS.
2. THE LENGTHS ARE APPROXIMATE VALUES BASED ON THE SOFTWARE CALCULATIONS. ACTUAL CONDUCTOR LENGTH MIGHT VARY DUE TO THE FIELD CONDITIONS.
3. DO NOT USE CONDUCTORS SMALLER THAN 12 AWG.
4. DUE TO THE SOFTWARE LIMITATION, THE EQUIPMENT GROUNDING CONDUCTOR SIZE MIGHT NOT BE SHOWN INCREASED WHEN UNGROUNDED CONDUCTORS SIZE IS INCREASED DUE TO THE ANY REASON. INCREASE THE EQUIPMENT GROUNDING CONDUCTOR SIZE PROPORTIONALLY TO INCREASE OF THE UNGROUNDED CONDUCTORS PER NEC ARTICLE 250.122(B) IF NEEDED.
5. THE "TYPE" COLUMN HAS REFERENCES TO THE MATERIAL OF THE CONDUCTORS. "CU" REFERS TO COPPER AND "AL" TO ALUMINUM CONDUCTORS.

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, CO 80202
Ph: 303.389.0095 | FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

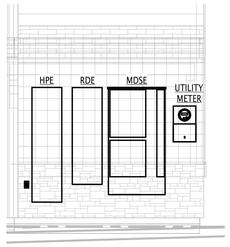
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

FEEDERS BRANCH CIRCUITS SCHEDULE

EG005

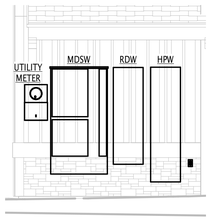
PLOT DATE: 3/23/2022 8:20:19 AM

COPYRIGHT©



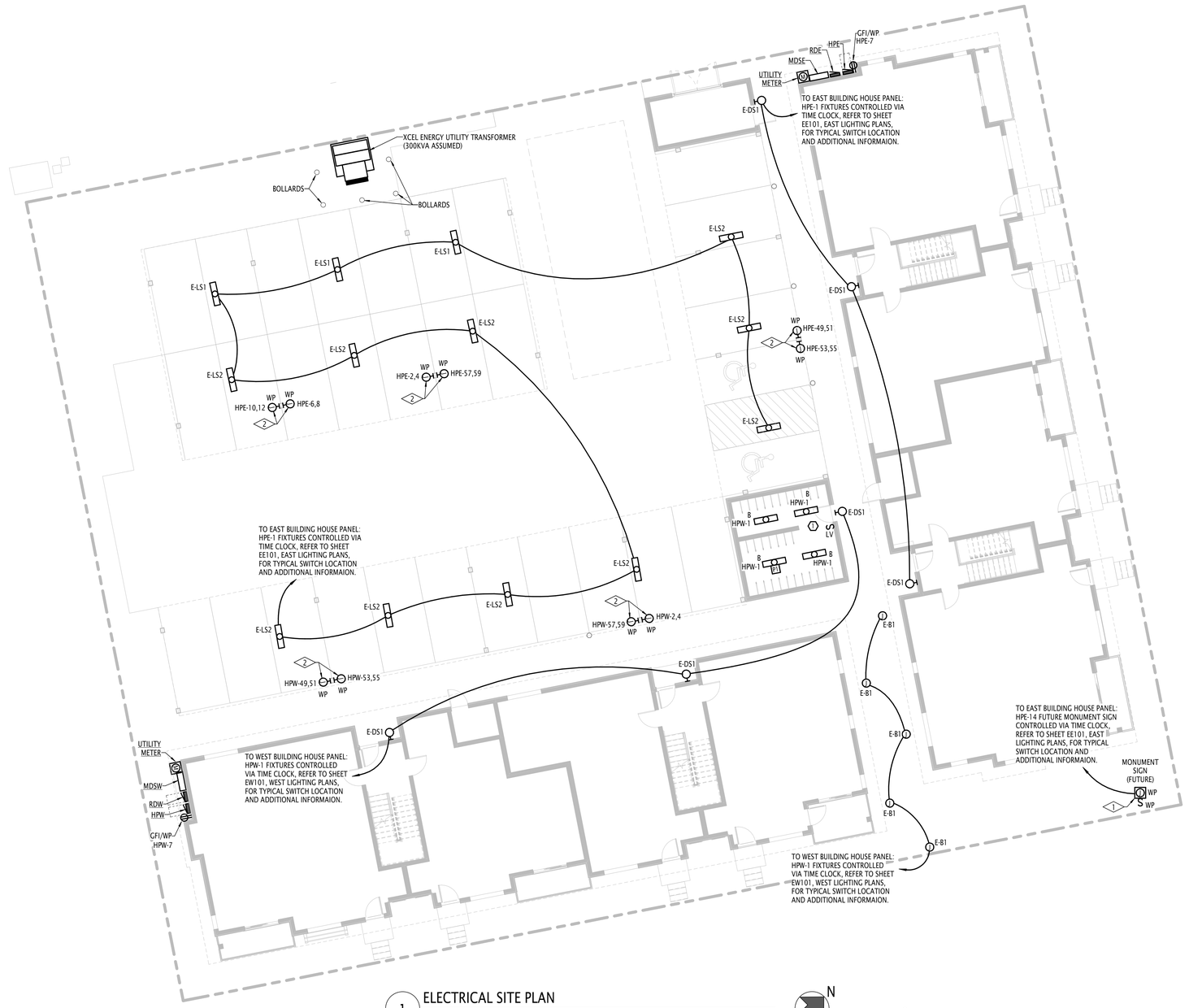
2 EAST BUILDING SERVICE EQUIPMENT ELEVATION

NO SCALE



3 WEST BUILDING SERVICE EQUIPMENT ELEVATION

NO SCALE



1 ELECTRICAL SITE PLAN

SCALE: 1" = 10'-0"

0' 4' 8' 16' 32'

X ELECTRICAL DETAIL NOTES

1 ELECTRICAL CONTRACTOR SHALL PROVIDE 1" PVC40 CONDUIT AND PULL STRING FROM EAST BUILDING TO OWNER PROVIDED MONUMENT SIGN (FUTURE) IN THE APPROXIMATE LOCATION SHOWN. CIRCUIT MONUMENT SIGN TO EAST BUILDING HOUSE PANEL, HPE, CIRCUIT 14. COORDINATE EXACT LOCATION, CONDUIT SIZE, ROUTING AND ANY ADDITIONAL INSTALLATION REQUIREMENTS WITH ARCHITECT AND OWNER PRIOR TO ROUGH-IN.

2 PROVIDE ELECTRIC VEHICLE (EV) READY SPACE WHERE INFRASTRUCTURE IS INSTALLED AND IS MADE READY FOR A FUTURE ELECTRIC VEHICLE. THE FOLLOWING NEEDS TO BE PROVIDED:
A. THE MINIMUM 1" CONDUIT TO BE INSTALLED FROM THE PANEL LOCATION TO THE FUTURE EVSE LOCATION
B. MINIMUM 8 AWG CU CONDUCTORS TO BE INSTALLED IN THE CONDUIT
C. THE TERMINATION AT EVSE LOCATION SHALL BE DONE IN EITHER:
- 40-AMPERES RATED NEMA RECEPTACLE OR SAE J1772 EV PLUG
- A JUNCTION BOX OR OUTLET BOX THAT IS CAPPED OFF WITH THE CONDUIT SEALED AND THE CAP LABELED AS "EV READY FOR FUTURE USE"
- AN EVSE INSTALLED WITHIN THE PARKING SPACE.
THE ELECTRICAL LOAD FOR EV READY SPACES IS INCLUDED IN THE UTILITY SERVICE CALCULATIONS FOR SERVICE EQUIPMENT SIZING. THE SPACES FOR THE ASSOCIATED CIRCUIT BREAKERS WILL BE RESERVED IN THE PANELS AND MARKED AS "EV READY SPACES."

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, CO 80202
PH: 303.389.0095 | FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

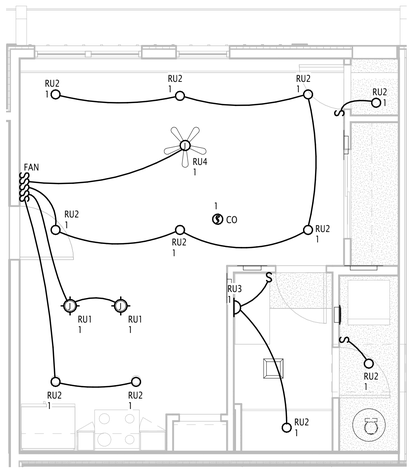
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

ELECTRICAL SITE PLAN

EG101

PLOT DATE: 3/23/2022 8:20:20 AM

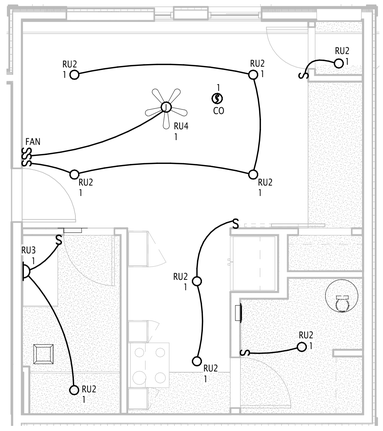
COPYRIGHT©



1 UNIT S.1 ENLARGED LIGHTING PLAN

SCALE: 1/4" = 1'-0"

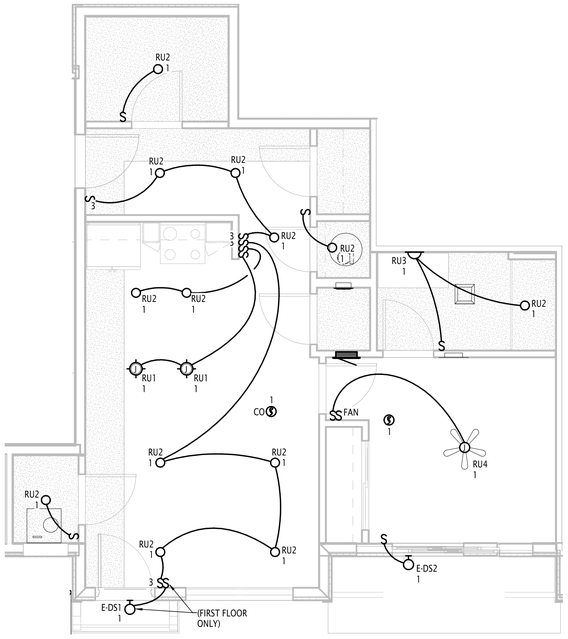
0' 1' 2' 4' 8' 16'



3 UNIT S.2 ENLARGED LIGHTING PLAN

SCALE: 1/4" = 1'-0"

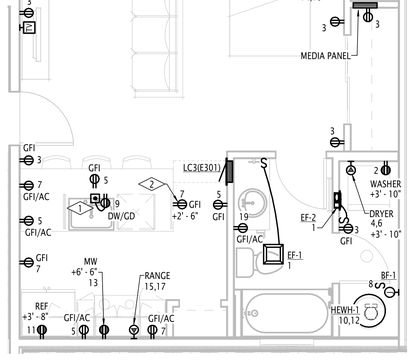
0' 1' 2' 4' 8' 16'



5 UNIT 1.1 ENLARGED LIGHTING PLAN

SCALE: 1/4" = 1'-0"

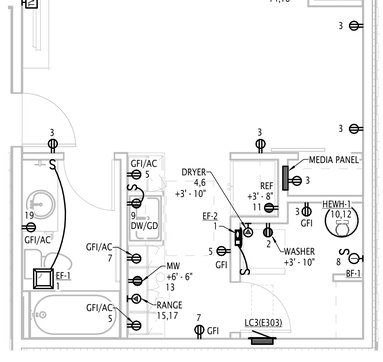
0' 1' 2' 4' 8' 16'



2 UNIT S.1 ENLARGED POWER PLAN

SCALE: 1/4" = 1'-0"

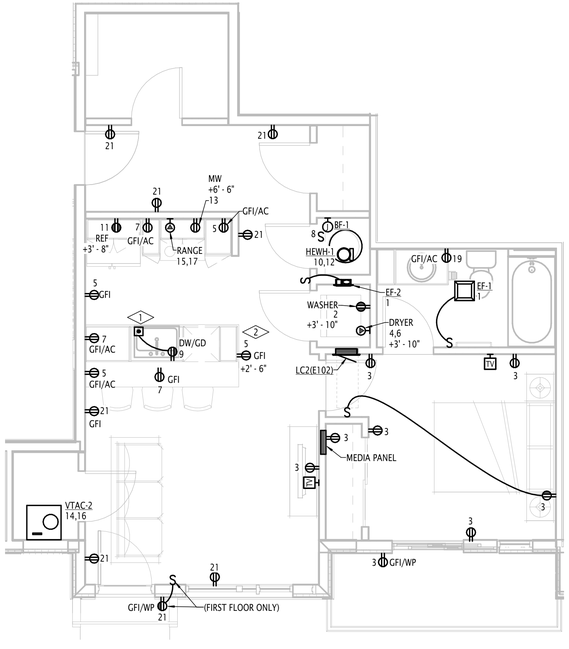
0' 1' 2' 4' 8' 16'



4 UNIT S.2 ENLARGED POWER PLAN

SCALE: 1/4" = 1'-0"

0' 1' 2' 4' 8' 16'



6 UNIT 1.1 ENLARGED POWER PLAN

SCALE: 1/4" = 1'-0"

0' 1' 2' 4' 8' 16'

RESIDENTIAL NOTES

1. THESE NOTES APPLY TO ALL ELECTRICAL DRAWINGS CONTAINING TYPICAL UNIT ELECTRICAL PLANS.
2. UNIT PLANS MAY BE MIRRORED AND/OR ROTATED RELATIVE TO THE FLOOR PLAN. REFER TO ARCHITECTURAL AND ELECTRICAL FLOOR PLANS FOR LOCATION AND ORIENTATION OF THE UNITS.
3. REFER TO ARCHITECTURAL AND INTERIOR DESIGN DRAWINGS FOR EXACT DEVICE AND LIGHT FIXTURE LOCATIONS, ORIENTATIONS AND MOUNTING HEIGHTS.
4. FURNISH AND INSTALL LIGHT FIXTURES COMPLETE WITH LAMPS, BALLAST(S), AND MOUNTING HARDWARE. ELECTRICAL CONTRACTOR SHALL SUBMIT FIXTURE CUT SHEETS TO ARCHITECT AND OWNER FOR THEIR FINAL APPROVAL PRIOR TO ORDERING OF THE LUMINAIRES. ELECTRICAL CONTRACTOR SHALL ALSO VERIFY QUANTITIES, MOUNTING REQUIREMENTS, FINISHES, FIXTURE AVAILABILITY AND LEAD TIME FOR DELIVERY TO SITE.
5. LIGHT FIXTURES AND OTHER CEILING DEVICES SHALL BE EQUALLY SPACED AND ALIGNED WITH ADJACENT ELEMENTS AND CENTERED ON CEILING ELEMENTS, U.N.O.
6. THE LIGHT FIXTURE(S) INSTALLED IN CLOTHES CLOSETS SHALL BE LISTED FOR INSTALLATION WITHIN CLOTHES STORAGE SPACES OR SHALL UTILIZE COMPLETELY ENCLOSED LED LIGHT SOURCES AS INDICATED IN NEC ARTICLE 410.16. THE FIXTURE(S) SHALL BE INSTALLED SUCH THAT MINIMUM CLEARANCES FROM CLOTHES STORAGE AREAS ARE MAINTAINED AS FOLLOWS: 12 INCHES FROM SURFACE-MOUNTED FIXTURES OR 6 INCHES FOR RECESSED FIXTURES.
7. ALL ELECTRICAL DEVICES SHALL BE COLOR WHITE WITH WHITE WALL PLATES. ALL SWITCHES SHALL BE DECORA-STYLE, UNLESS NOTED OTHERWISE. MULTIPLE LIGHT SWITCHES SHALL BE MOUNTED IN A MULTIPLE-GANG BOX WITH SINGLE COVER PLATE. REFER TO ARCHITECTURAL AND INTERIOR DESIGN DRAWINGS FOR ADDITIONAL INFORMATION AND REQUIREMENTS FOR ELECTRICAL DEVICE TYPE, COLOR AND FINISH REQUIREMENTS.
8. ALL RECEPTACLE AND DATA/PHONE/TV OUTLETS SHALL BE MOUNTED AT STANDARD HEIGHT OF 18" ABOVE FINISHED FLOOR (AFF), UNLESS NOTED OTHERWISE (UNO). COORDINATE MOUNTING HEIGHTS WITH ARCHITECTURAL AND INTERIOR DESIGNER DRAWINGS.
9. LIGHTING CONTROLS, LOAD CENTERS, SWITCHES, RECEPTACLES AND PHONE/TV OUTLETS INTENDED FOR UNOBSTRUCTED FORWARD OR SIDE REACH SHALL BE LOCATED 48-INCHES MAXIMUM AND 15-INCHES MINIMUM ABOVE THE FLOOR PER ICC A117.1-2009 REQUIREMENTS. UNIT'S LOAD CENTERS SHALL BE INSTALLED WITH CIRCUIT BREAKERS LOCATED NOT HIGHER THAN 48-INCHES ABOVE FINISHED FLOOR.
10. 125-VOLT, SINGLE PHASE, 15- AND 20-AMPERE RECEPTACLES INSTALLED IN BATHROOMS OR IN THE KITCHENS, WHERE INSTALLED TO SERVE THE COUNTERTOP SURFACES, SHALL HAVE GROUND-FAULT CIRCUIT-INTERRUPTER PROTECTION FOR PERSONNEL PER NATIONAL ELECTRICAL CODE (NEC) ARTICLE 210.8 (A).
11. WHEN RECEPTACLE IS MARKED AS "GFI", GFCI PROTECTION NEEDS TO BE PROVIDED. PROVIDE GFCI-TYPE CIRCUIT BREAKER OR RECEPTACLE. WHEN MULTIPLE RECEPTACLES ARE SHOWN AS "GFI" AND CONNECTED TO THE SAME CIRCUIT NOT PROTECTED BY GFCI-TYPE CIRCUIT BREAKER, FIRST RECEPTACLE IN THE BRANCH CIRCUIT NEEDS TO BE GFCI-TYPE WITH ALL OTHER RECEPTACLES CONNECTED TO THE LOAD SIDE OF THIS RECEPTACLE.
12. EACH MULTIWIRE BRANCH CIRCUIT SHALL BE PROVIDED WITH A MEANS THAT WILL SIMULTANEOUSLY DISCONNECT ALL UNGROUNDED CONDUCTORS AT THE POINT WHERE THE BRANCH CIRCUIT ORIGINATES.
13. THE UNGROUNDED AND GROUNDED CONDUCTORS OF EACH MULTIWIRE BRANCH CIRCUIT SHALL BE GROUPED BY WIRE TIES OR SIMILAR MEANS IN AT LEAST ONE LOCATION WITHIN THE PANELBOARD OR OTHER POINT OF ORIGIN.
14. WHERE INDIVIDUAL BOXES (TELEPHONE, ELECTRICAL, ETC.) ARE INSTALLED ON EITHER SIDE OF A PARTITION SEPARATING DWELLING UNITS OR DWELLING UNIT & CORRIDOR, STAGGER BOXES A MINIMUM OF 2'-0". THESE BOXES SHALL ALSO BE COVERED WITH EITHER A FIRE OR SOUND PUTTY PAD. ENSURE ELECTRICAL BOXES AND FIXTURES ARE INSTALLED PER IBC SECTIONS 713.3.2 AND 713.4.1.2 FOR MINIMUM MEMBRANE PENETRATION PROTECTION REQUIREMENTS.
15. ALL 125-VOLT, 15- AND 20-AMPERE RECEPTACLES IN THE RESIDENTIAL UNITS SHALL BE LISTED AS TAMPER-RESISTANT.
16. MICROWAVE/HOOD RECEPTACLE SHALL BE INSTALLED HORIZONTALLY.
17. RECEPTACLES AND SWITCHES SHALL NOT BE INSTALLED WITHIN OR DIRECTLY OVER A BATHTUB.
18. INSTALL FIRESTOPPING PUTTY PADS ON OUTLET BOXES IN THE FIRE RATED WALLS.
19. MECHANICAL EQUIPMENT LOCATIONS, WIRING, AND ADDITIONAL INSTALLATION REQUIREMENTS SHALL BE VERIFIED AND COORDINATED WITH MECHANICAL CONTRACTOR.
20. EACH TV OUTLET SHALL BE EQUIPPED WITH COAXIAL (RG6) CONNECTION. ADDITIONAL LOW VOLTAGE BOXES ARE REQUESTED. COORDINATE EXACT JUNCTION BOX LOCATIONS AND ADDITIONAL INSTALLATION REQUIREMENTS WITH TELECOMMUNICATIONS CONTRACTOR.
21. ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL LINE VOLTAGE SMOKE AND COMBINATION SMOKE/CO ALARMS WITH BATTERY BACKUP AND SOUND ANNUNCIATION. WHERE MORE THAN ONE SMOKE ALARM IS INSTALLED WITHIN INDIVIDUAL UNIT, THE SMOKE ALARMS SHALL BE INTERCONNECTED IN SUCH A MANNER THAT THE ACTIVATION OF ONE ALARM WILL ACTIVATE ALL OF THE ALARMS IN THE INDIVIDUAL UNIT. LOCATION SMOKE DETECTORS SHALL BE COORDINATED WITH REQUIREMENTS OF THE INTERNATIONAL FIRE ALARM CODE FOR FULLY SPRINKLERED BUILDING AND LOCAL AUTHORITY HAVING JURISDICTION. COORDINATE WITH FIRE ALARM CONTRACTOR IF ANNUNCIATION SHALL BE PROVIDED TO THE BUILDING FIRE ALARM SYSTEM.
22. SMOKE DETECTORS AND FIRE ALARM SYSTEM ANNUNCIATION DEVICES LOCATED IN ANSI TYPE "A" ROOMS IN ADDITION TO SOUND ANNUNCIATION SHALL BE EQUIPPED WITH BUILT-IN STROBE LIGHT PROVIDING AN EFFECTIVE INTENSITY OF NOT LESS THAN 110 CANDELA.
23. ALL DWELLING UNITS SHALL BE PROVIDED WITH THE CAPABILITY TO SUPPORT VISIBLE ALARM NOTIFICATION APPLIANCES IN ACCORDANCE WITH CHAPTER 10 OF ICC A117.1. SUCH CAPABILITY SHALL BE PERMITTED TO INCLUDE THE POTENTIAL FOR FUTURE INTERCONNECTIONS OF THE BUILDING FIRE ALARM SYSTEM WITH THE UNIT SMOKE ALARMS, REPLACEMENT OF AUDIBLE APPLIANCES WITH COMBINATION AUDIBLE/VISIBLE APPLIANCES, OR FUTURE EXTENSION OF THE EXISTING WIRING FROM THE UNIT SMOKE ALARM LOCATIONS TO REQUIRED LOCATIONS FOR VISIBLE APPLIANCES.
24. DRYER BRANCH CIRCUIT CONDUCTORS SHALL BE (3-10 CU & 1-10 CU GND). COORDINATE PLUG CONFIGURATION WITH APPLIANCES SUPPLIER.
25. RANGE BRANCH CIRCUIT CONDUCTORS SHALL BE (3-6 CU & 1-10 CU GND). COORDINATE CIRCUIT BREAKER SIZE AND PLUG CONFIGURATION WITH APPLIANCE SUPPLIER.
26. FAN COIL UNIT SHALL BE HARDWIRED. ELECTRICAL CONTRACTOR SHALL VERIFY THAT UNIT IS PROVIDED WITH INTEGRAL SWITCH WITH A MARKED-OFF POSITION THAT DISCONNECTS ALL UNGROUNDED CONDUCTORS. PROVISIONS OF THE NEC ARTICLE 422.34 APPLIED FOR THIS INSTALLATION.

X ELECTRICAL DETAIL NOTES

1 PROVIDE SINK-TOP SWITCH KIT FOR GARBAGE DISPOSAL. COORDINATE BUTTON FINISH AND EXACT LOCATION WITH ARCHITECT AND INTERIOR DESIGNER. THE BUTTON SHALL FIT STANDARD 1-1/4" TO 1-1/2" DIAMETER SINK FAUCET HOLE. VERIFY WITH PLUMBING CONTRACTOR THAT THE BUTTON SYSTEM IS COMPATIBLE WITH PROVIDED GARBAGE DISPOSAL AND PROVIDES THE NON-SWITCHED RECEPTACLE FOR DISHWASHER.

2 ISLAND OR PENINSULA RECEPTACLE TO BE MOUNTED NOT MORE THAN 12" BELOW THE COUNTERTOP. THE COUNTERTOP AT THIS LOCATION SHALL NOT EXTEND MORE THAN 6" BEYOND IT'S SUPPORT BASE. COORDINATE EXACT DEVICE LOCATION AND MOUNTING HEIGHT WITH ARCHITECT/ CLIENT PRIOR TO ROUGH-IN.

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, CO 80202
Ph: 303.389.0095 | FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

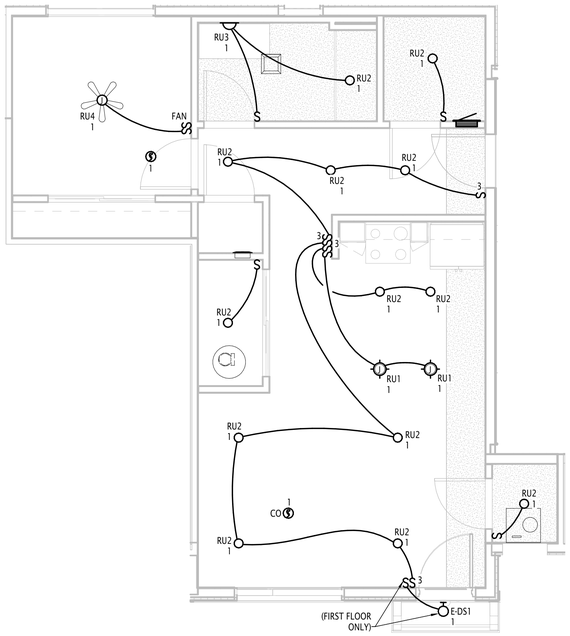
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

ENLARGED TYPICAL UNIT ELECTRICAL PLANS

EG401

PLOT DATE: 3/23/2022 8:20:34 AM

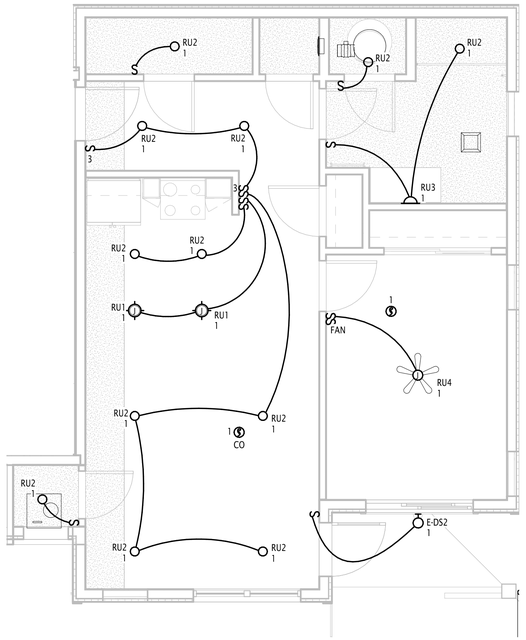
COPYRIGHT©



1 UNIT 1.2 ENLARGED LIGHTING PLAN

SCALE: 1/4" = 1'-0"

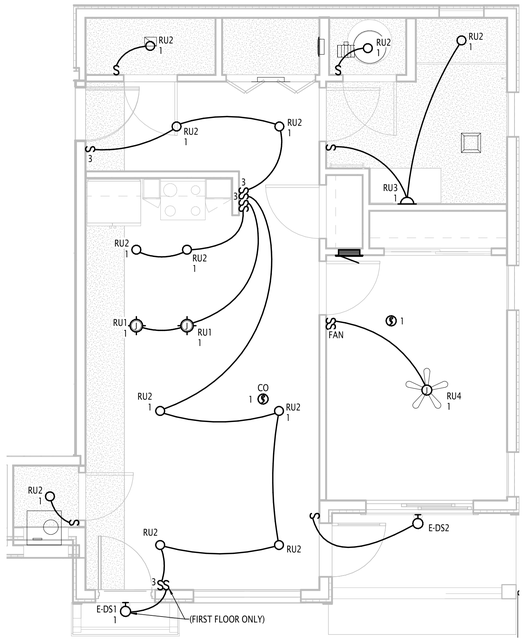
0' 1' 2' 4' 8' 16'



3 UNIT 1.3 ENLARGED LIGHTING PLAN

SCALE: 1/4" = 1'-0"

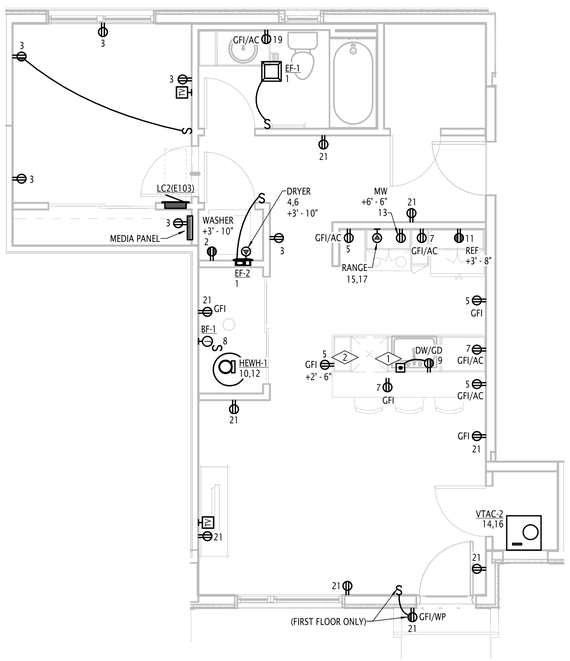
0' 1' 2' 4' 8' 16'



5 UNIT 1.3A ENLARGED LIGHTING PLAN

SCALE: 1/4" = 1'-0"

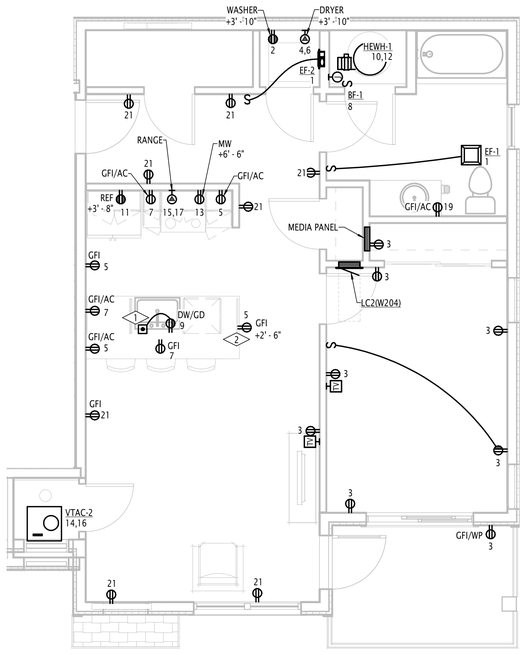
0' 1' 2' 4' 8' 16'



2 UNIT 1.2 ENLARGED POWER PLAN

SCALE: 1/4" = 1'-0"

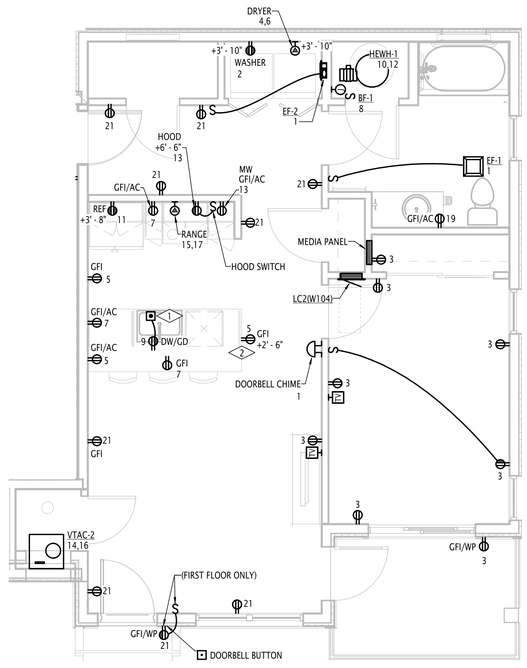
0' 1' 2' 4' 8' 16'



4 UNIT 1.3 ENLARGED POWER PLAN

SCALE: 1/4" = 1'-0"

0' 1' 2' 4' 8' 16'



6 UNIT 1.3A ENLARGED POWER PLAN

SCALE: 1/4" = 1'-0"

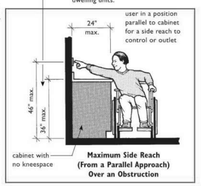
0' 1' 2' 4' 8' 16'

Side Reach Over an Obstruction

To reach controls and outlets mounted over base cabinets which lack knee space, a person using a wheelchair must be able to approach the cabinet from a position parallel to the cabinet and execute a side reach. This parallel position is made up of a 30-inch x 48-inch clear floor space adjoining a 36-inch wide minimum accessible route. When executing a side reach over a cabinet, the upper limit of the range is reduced to 46 inches.

Cabinet depth is limited to 24 inches. HUD permits use of a standard 24-inch deep cabinet with an additional extension of 1 to 1-1/2 inches for countertops for a maximum depth of 25-1/2 inches. If a built-in shelf, cabinet, or other obstruction must be deeper than 25-1/2 inches, then any switches, outlets, and controls that must be in accessible locations are not permitted to be installed over such deep surfaces.

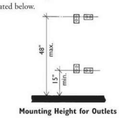
Countertop is shown at the typical kitchen height of 36". The drawing in the Guidelines (taken from ANSI Figure 6(c)), on which this drawing is based, gives this dimension as 34". The 34" dimension shown in the Guidelines is in no way intended to dictate counter heights in covered dwelling units.



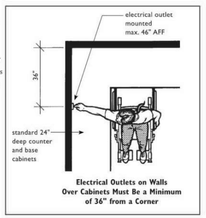
Maximum Side Reach (from a Parallel Approach) Over an Obstruction

Mounting Locations for Outlets

For accessible controls and outlets, all operable parts must be within the ranges specified above. When electrical outlets are installed horizontally or vertically, duplex outlets must have both receptacles within the reach range. Measurements are made as illustrated below.



Mounting Height for Outlets



Electrical Outlets on Walls Over Cabinets Must Be a Minimum of 36" from a Corner

X ELECTRICAL DETAIL NOTES

1 PROVIDE SINK-TOP SWITCH KIT FOR GARBAGE DISPOSAL. COORDINATE BUTTON FINISH AND EXACT LOCATION WITH ARCHITECT AND INTERIOR DESIGNER. THE BUTTON SHALL FIT STANDARD 1-1/4" TO 1-1/2" DIAMETER SINK FAUCET HOLE. VERIFY WITH PLUMBING CONTRACTOR THAT THE BUTTON SYSTEM IS COMPATIBLE WITH PROVIDED GARBAGE DISPOSAL AND PROVIDES THE NON-SWITCHED RECEPTACLE FOR DISHWASHER.

2 ISLAND OR PENINSULA RECEPTACLE TO BE MOUNTED NOT MORE THAN 12" BELOW THE COUNTERTOP. THE COUNTERTOP AT THIS LOCATION SHALL NOT EXTEND MORE THAN 6" BEYOND IT'S SUPPORT BASE. COORDINATE EXACT DEVICE LOCATION AND MOUNTING HEIGHT WITH ARCHITECT/ CLIENT PRIOR TO ROUGH-IN.

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, CO 80202
PH: 303.389.0095 | FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

Sheet Issue & Revision Log

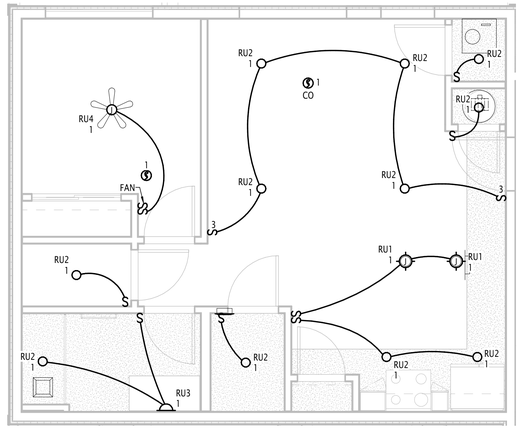
No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

ENLARGED TYPICAL UNIT ELECTRICAL PLANS **EG402**

PLOT DATE: 3/23/2022 8:20:48 AM

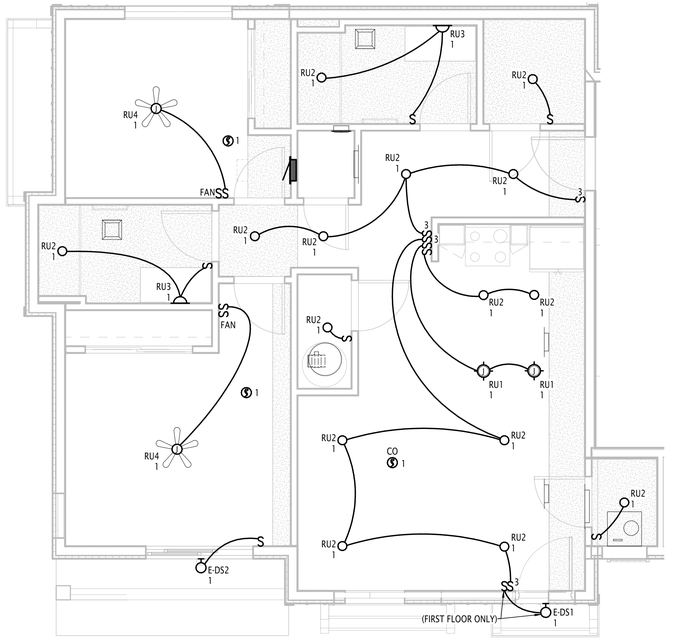
COPYRIGHT©



1 UNIT 1.4 ENLARGED LIGHTING PLAN

SCALE: 1/4" = 1'-0"

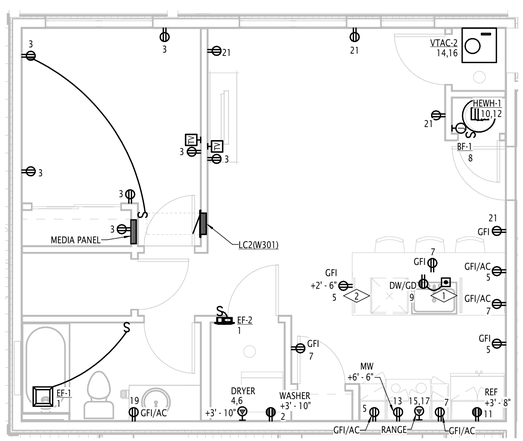
0' 1" 2' 4' 8' 16'



3 UNIT 2.1 ENLARGED LIGHTING PLAN

SCALE: 1/4" = 1'-0"

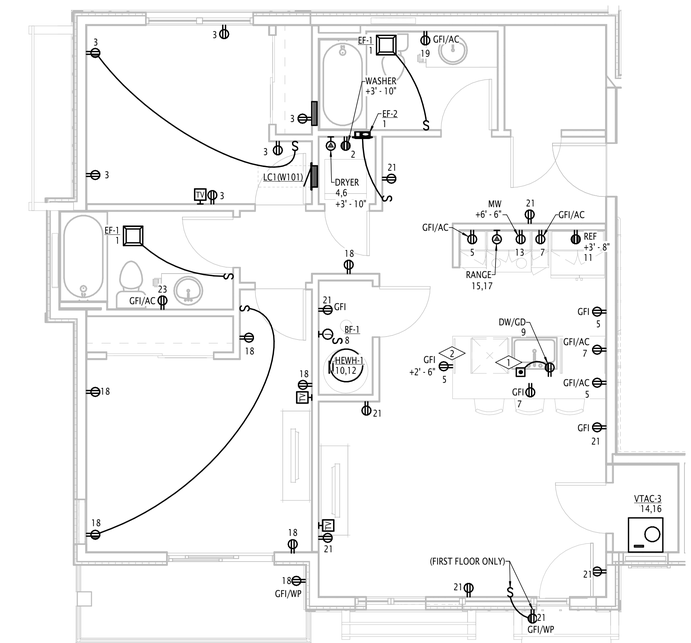
0' 1" 2' 4' 8' 16'



2 UNIT 1.4 ENLARGED POWER PLAN

SCALE: 1/4" = 1'-0"

0' 1" 2' 4' 8' 16'



4 UNIT 2.1 ENLARGED POWER PLAN

SCALE: 1/4" = 1'-0"

0' 1" 2' 4' 8' 16'

ELECTRICAL DETAIL NOTES

1 PROVIDE SINK-TOP SWITCH KIT FOR GARBAGE DISPOSAL. COORDINATE BUTTON FINISH AND EXACT LOCATION WITH ARCHITECT AND INTERIOR DESIGNER. THE BUTTON SHALL FIT STANDARD 1-1/4" TO 1-1/2" DIAMETER SINK FAUCET HOLE. VERIFY WITH PLUMBING CONTRACTOR THAT THE BUTTON SYSTEM IS COMPATIBLE WITH PROVIDED GARBAGE DISPOSAL AND PROVIDES THE NON-SWITCHED RECEPTACLE FOR DISHWASHER.

2 ISLAND OR PENINSULA RECEPTACLE TO BE MOUNTED NOT MORE THAN 12" BELOW THE COUNTERTOP. THE COUNTERTOP AT THIS LOCATION SHALL NOT EXTEND MORE THAN 6" BEYOND IT'S SUPPORT BASE. COORDINATE EXACT DEVICE LOCATION AND MOUNTING HEIGHT WITH ARCHITECT/ CLIENT PRIOR TO ROUGH-IN.

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, CO 80202
PH: 303.389.0095 / FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

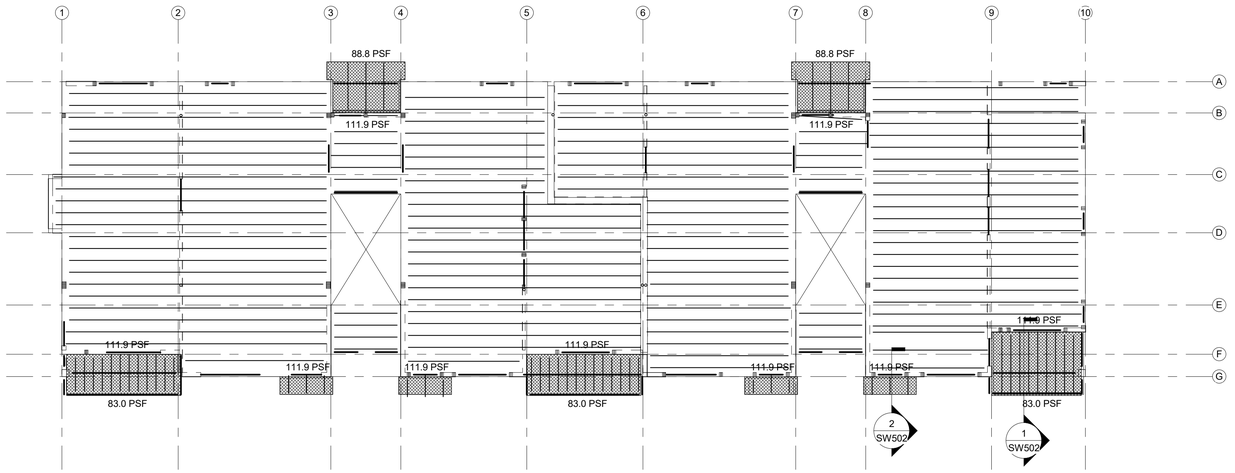
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

ENLARGED TYPICAL UNIT ELECTRICAL PLANS

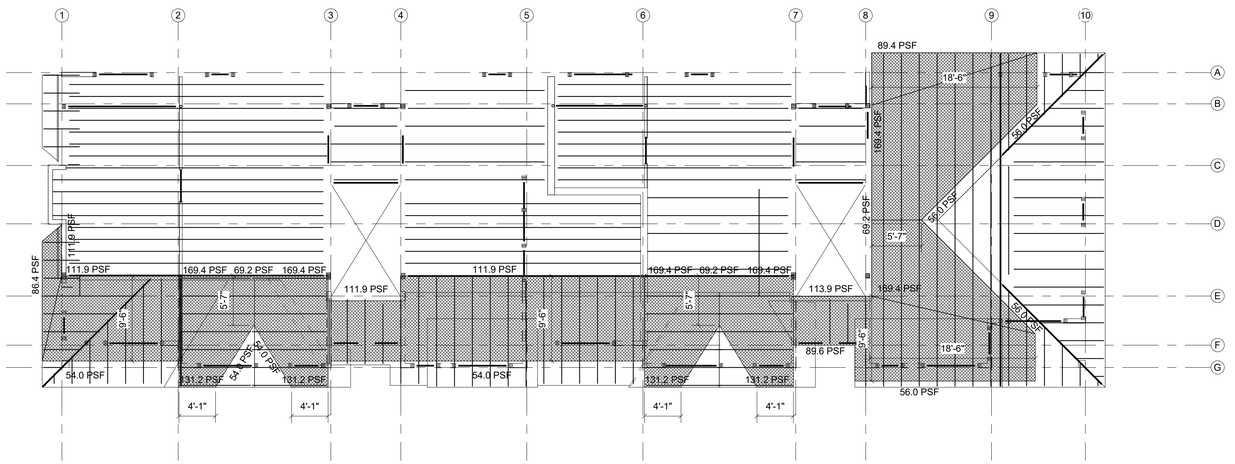
EG403

PLOT DATE: 3/23/2022 8:20:57 AM

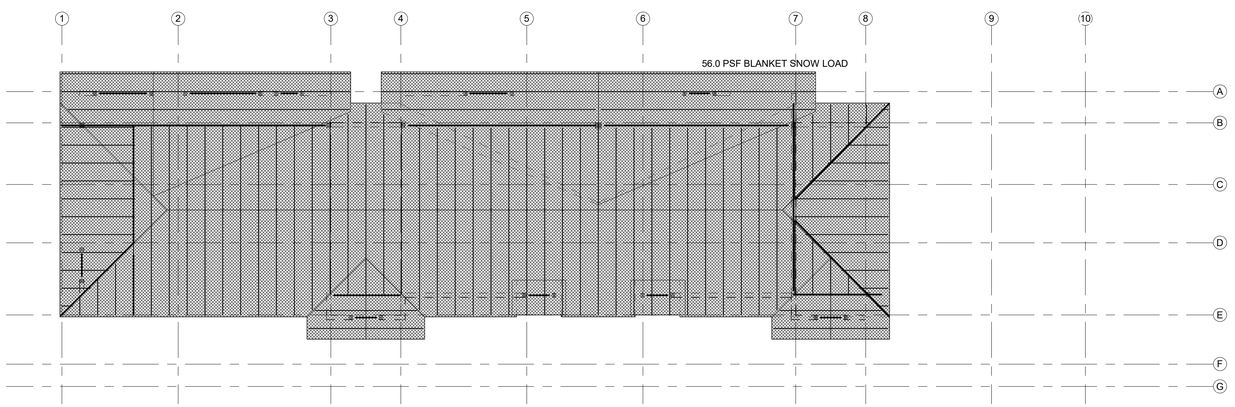
COPYRIGHT©



1 **LEVEL 2 - WEST SNOW LOAD**
1/8" = 1'-0"



2 **LEVEL 3 - WEST SNOW LOAD**
1/8" = 1'-0"



3 **ROOF - WEST SNOW LOAD**
1/8" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

Studio NYL
2955 Basel ne Road, #314 303.558.3145
Boulder, Colorado 80303 www.studionyl.com
Boulder | Denver | Colorado Springs Boston | Minneapolis

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21009

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

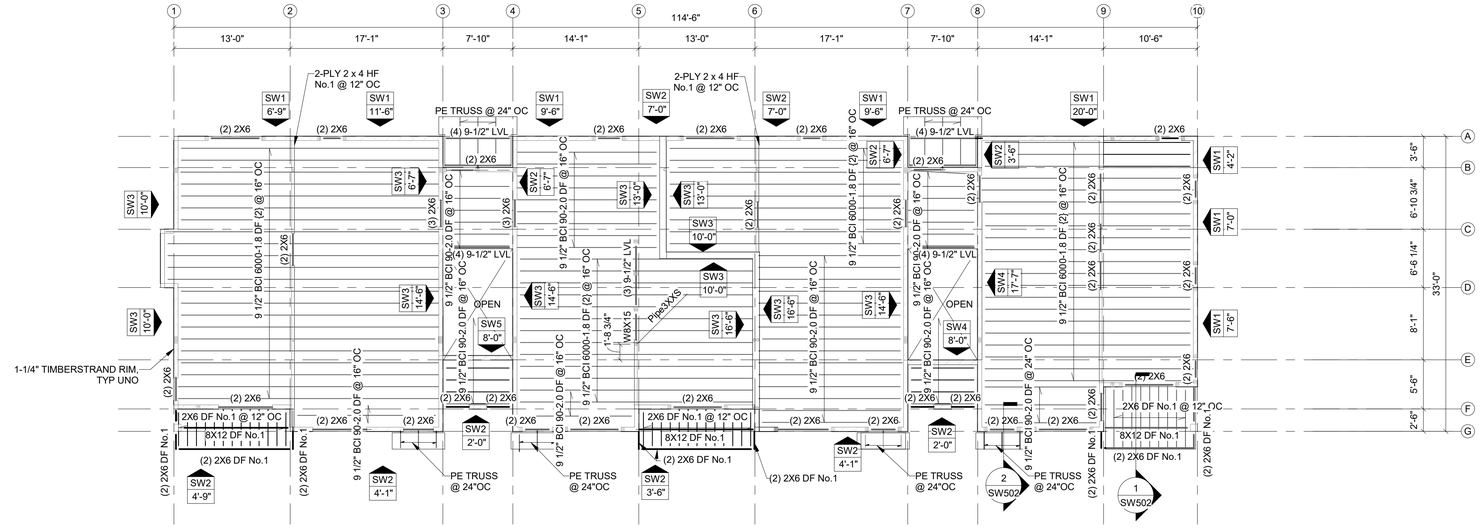
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

SNOW LOADING PLANS

SW100

PLOT DATE: 3/22/2022 11:05:18 AM

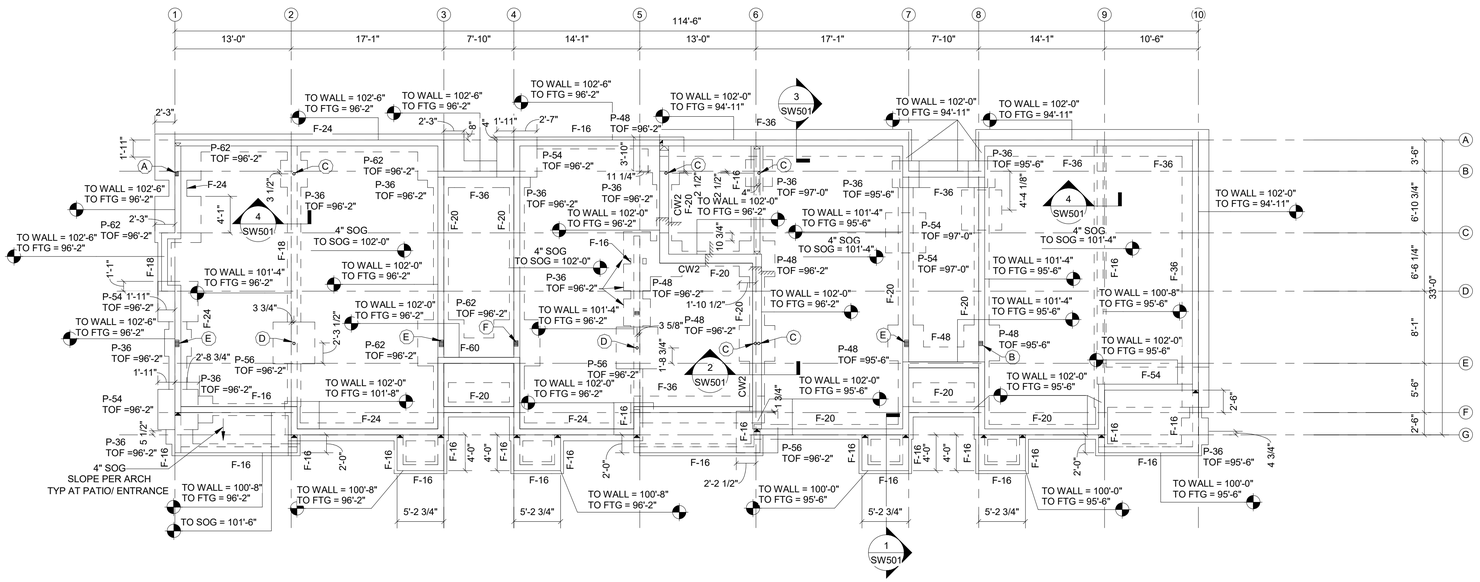
COPYRIGHT©



2 LEVEL 2 - WEST
1/8" = 1'-0"

LVL 1 WALLS:
- TYP INTERIOR BRG WALL - 2 x 4 HF No.1 @ 12" OC UNO
- TYP INTERIOR DEMISING WALL - 2 x 4 HF No.1 @ 12" OC EA SIDE
- TYP EXTERIOR BRG WALL - 2 x 6 HF No.2 @ 16" OC

FLOOR FRAMING PLAN NOTES
- REFER TO GENERAL STRUCTURAL NOTES FOR ADDITIONAL INFORMATION.
- VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS.
- VERIFY SITE DATUM WITH ARCHITECTS DRAWINGS.
- CONTRACTOR SHALL VERIFY ALL FIELD DIMENSIONS PRIOR TO CONSTRUCTION.
- DETAILS ARE NOT CUT AT EVERY LOCATION THEY OCCUR. IF A CONDITION IS UNCLEAR, CONTACT ARCHITECT IMMEDIATELY BEFORE PROCEEDING.
- COORDINATE ALL OPENINGS THROUGH STRUCTURAL MEMBERS W/ ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND CIVIL DRAWINGS. TRIM OPENINGS AS SHOWN ON PLANS.
- SEE MECH, ELECT, AND CIVIL DRAWINGS FOR SLEEVE LOCATIONS. PIPES, CONDUITS AND OTHER PENETRATIONS NOT SHOWN SHALL NOT PASS THROUGH MASONRY WALLS AND COLUMNS, CONCRETE WALLS, BEAMS AND COLUMNS OR STEEL BEAMS OR COLUMNS WITHOUT PRIOR APPROVAL FROM STRUCTURAL ENGINEER OF RECORD.
- REFER TO ARCHITECTURAL DRAWINGS FOR FIRE RATING AND UL DESIGN NUMBER.
- FOR MISCELLANEOUS STEEL NOT SHOWN ON PLANS, SEE GENERAL STRUCTURAL NOTES AND GRAPHICAL GENERAL NOTES
- PRELIMINARY ELEVATIONS SHOWN ARE BASED ON INFORMATION PROVIDED BY THE ARCHITECT AND ARE SUBJECT TO CHANGE.
- TOP OF STEEL IS NOTED THUS (###'-## ###").
- ALL COMPOSITE STEEL BEAMS ARE DESIGNED FOR UNSHORED CONSTRUCTION. DO NOT SHORE COMPOSITE BEAMS WITHOUT PERMISSION OF ENGINEER OF RECORD
- REFER TO GRAPHICAL GENERAL NOTES FOR HEADERS, BEARING STUDS (T, TRIMMER STUDS) AND WIND STUDS (KS, KING STUDS). PROVIDE MINIMUM (2) 2x TRIMMER STUDS UNDER EACH BEAM OR HEADER AND (2) 2x KING STUDS EACH END WHERE NOT NOTED ON PLAN.
- SHEARWALLS SHOWN ARE FROM LEVEL BELOW TO PLAN LEVEL.
- WALL STUDS SHALL BE PER STUD SCHEDULE ON PLAN
- STEEL BEAM SHEAR CONN SHALL BE PER GGN ST-16 UNO
- ROOF SHEATHING SHALL BE 23/32" PLYWOOD OR O.S.B. (48/24 RATING) ATTACHED TO FRAMING W/ 0.148a NAILS SPACED AT 4" OC ALONG ALL PANEL EDGES AND 12" OC IN THE FIELD, MIN 1-1/2" PEN INTO FRAMING (UNBLOCKED)
- FLOOR SHEATHING SHALL BE 23/32" PLYWOOD OR O.S.B. (24 OC RATING) ATTACHED TO FRAMING W/ 0.148a NAILS SPACED AT 4" OC ALONG ALL PANEL EDGES AND 12" OC IN THE FIELD, MIN 1-1/2" PEN INTO FRAMING (UNBLOCKED)



1 FOUNDATION PLAN - WEST
1/8" = 1'-0"

FOUNDATION:
- TYP STRIP FTG TO BE 16" WIDE X 12" DEEP. REINF W/ (2) #5 T&B LONG
- ISOLATED FTG P-36 TO BE 36"x36"x12". REINF W/ (5) #5 EA WAY.
- ISOLATED FTG P-48 TO BE 48"x48"x12". REINF W/ (8) #5 EA WAY.
- FROST DEPTH = 40" PER GEOTECH.

CONCRETE WALL SCHEDULE

MARK	WIDTH	REINFORCING
CW1	8"	(2)#5 T+B (HORIZ) #4 EA FACE @16" OC HORIZ, #4 VERTS @16" OC EA FACE
CW2	1'-0"	(2)#5 T+B (HORIZ) #4 EA FACE @16" OC HORIZ, #4 VERTS @12" OC EA FACE

ALL WALLS CW1 UNO

STRUCTURAL COLUMN SCHEDULE

MARK	TYPE
A	(3) 2x6 HF #2
B	(4) 2x6 HF #2
C	Pipe3STD
D	Pipe3XXS
E	(6) 2x6 HF #2
F	(5) 2x6 HF #2

ISOLATED FOOTING SCHEDULE

MARK	LENGTH	WIDTH	THICKNESS	REINFORCING
P-36	3'-0"	3'-0"	1'-0"	(4)#5 EA WAY T+B
P-48	4'-0"	4'-0"	1'-0"	(5)#5 EA WAY T+B
P-54	4'-6"	4'-6"	1'-4"	(6) # EA WAY T+B
P-56	4'-8"	4'-8"	1'-4"	(6) # EA WAY T+B
P-62	5'-2"	5'-2"	1'-0"	(4)#5 EA WAY T+B

STRIP FOOTING SCHEDULE

MARK	WIDTH	THICKNESS	REINFORCING
F-16	1'-4"	1'-0"	(3) #5 LONG, #5@12" OC TRANS
F-18	1'-6"	1'-0"	(3) #5 LONG, #5@12" OC TRANS
F-20	1'-8"	1'-0"	(3) #5 LONG, #5@12" OC TRANS
F-24	2'-0"	1'-0"	(3) #5 LONG, #5@12" OC TRANS
F-36	3'-0"	1'-0"	(3) #5 LONG, #5@12" OC TRANS
F-48	4'-0"	1'-0"	(3) #5 LONG, #5@12" OC TRANS
F-54	4'-6"	1'-0"	(3) #5 LONG, #5@12" OC TRANS
F-60	5'-0"	1'-0"	(3) #5 LONG, #5@12" OC TRANS

FOUNDATION PLAN NOTES
- REFER TO GENERAL STRUCTURAL NOTES FOR ADDITIONAL INFORMATION.
- VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS.
- VERIFY SITE DATUM WITH ARCHITECTS DRAWINGS.
- CONTRACTOR SHALL VERIFY ALL FIELD DIMENSIONS PRIOR TO CONSTRUCTION.
- DETAILS ARE NOT CUT AT EVERY LOCATION THEY OCCUR. IF A CONDITION IS UNCLEAR, CONTACT ARCHITECT IMMEDIATELY BEFORE PROCEEDING.
- COORDINATE ALL OPENINGS THROUGH STRUCTURAL MEMBERS W/ ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND CIVIL DRAWINGS. TRIM OPENINGS AS SHOWN ON PLANS.
- SEE MECH, ELECT, AND CIVIL DRAWINGS FOR SLEEVE LOCATIONS. PIPES, CONDUITS AND OTHER PENETRATIONS NOT SHOWN SHALL NOT PASS THROUGH MASONRY WALLS AND COLUMNS, CONCRETE WALLS, BEAMS AND COLUMNS OR STEEL BEAMS OR COLUMNS WITHOUT PRIOR APPROVAL FROM STRUCTURAL ENGINEER OF RECORD.
- REFER TO ARCHITECTURAL DRAWINGS FOR FIRE RATING AND UL DESIGN NUMBER.
- FOR MISCELLANEOUS STEEL NOT SHOWN ON PLANS, SEE GENERAL STRUCTURAL NOTES AND GRAPHICAL GENERAL NOTES
- PRELIMINARY ELEVATIONS SHOWN ARE BASED ON INFORMATION PROVIDED BY THE ARCHITECT AND ARE SUBJECT TO CHANGE.
- VERIFY EXACT LOCATION OF STEPS, RAMPS, DEPRESSED AND/OR RAISED AREAS OF SLAB-ON-GRADE WITH ARCHITECTURAL DRAWINGS.
- SLAB ON GRADE SHALL BE CONCRETE REINFORCED W/ 6x6-W2.1xW2.1 WWF UNO
- ALL CONCRETE WALL REINFORCING INDICATED ON PLAN SHALL BE FULL HEIGHT OF WALL UNO.
- ALL FOOTINGS TO BE CENTERED ON FOUNDATION WALLS UNO.
- FOR ANCHOR BOLT SPACING AND HOLD-DOWNS REQUIRED AT SHEAR WALLS, REFER TO FRAMING PLAN AND SHEARWALL SCHEDULE.

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

Studio NYL
2955 Basel ne Road, #314 303.558.3145
Bou der, Colorado 80303 www.stud onyl.com
Boulder | Denver | Colorado Springs Boston | Minneapolis

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21009

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

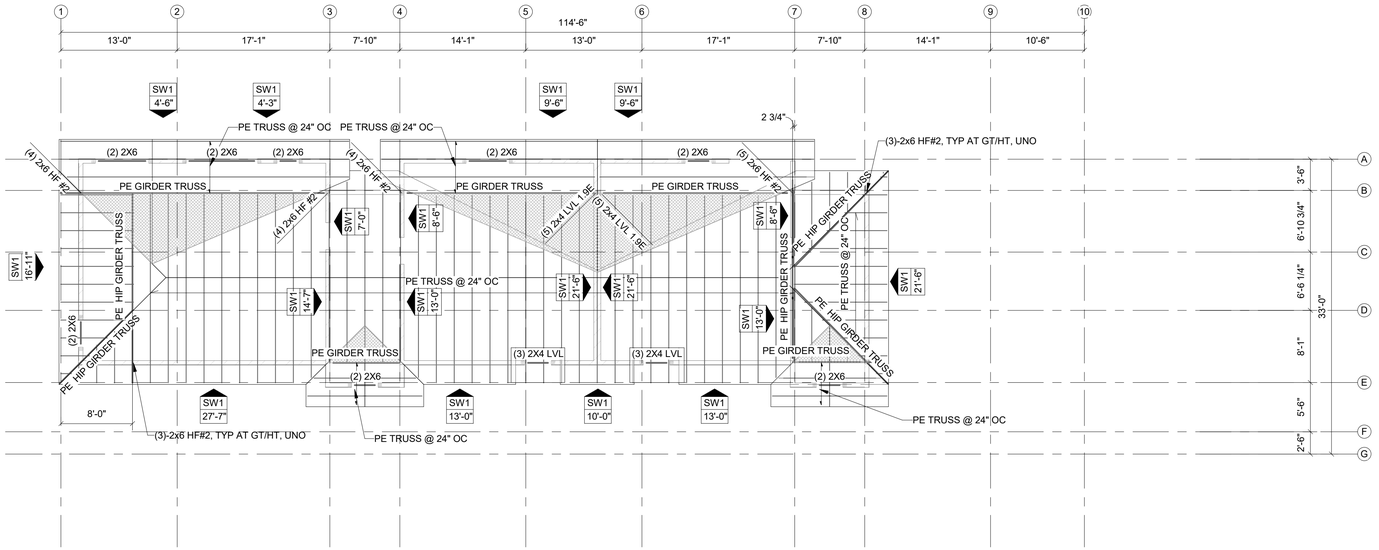
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

FOUNDATION & LEVEL 2 PLAN - WEST BUILDING

SW101

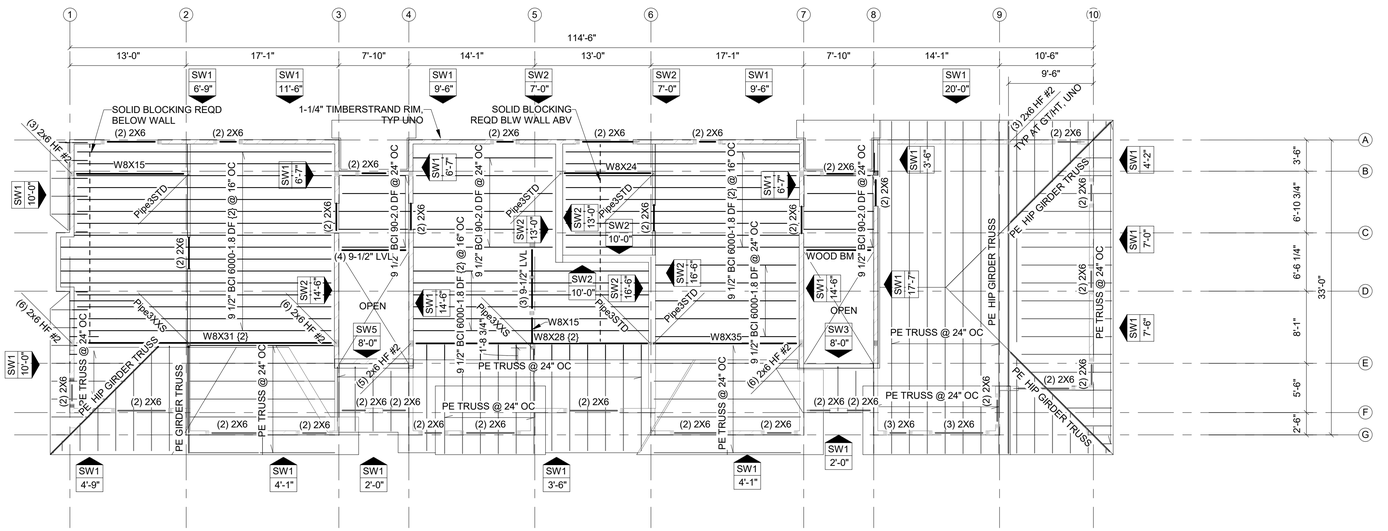
PLOT DATE: 3/22/2022 11:05:18 AM

COPYRIGHT©



ROOF - WEST
1/8" = 1'-0"

LVL 3 WALLS:
- TYP INTERIOR DEMISING WALL - 2 x 4 HF No.1 @ 16" OC EA SIDE
- TYP EXTERIOR BRG WALL - 2 x 6 HF No.2 @ 16" OC



LEVEL 3 - WEST
1/8" = 1'-0"

LVL 2 WALLS:
- TYP INTERIOR BRG WALL - 2 x 4 HF No.2 @ 12" OC UNO
- TYP INTERIOR DEMISING WALL -2 x 4 HF No.2 @ 16" OC EA SIDE
- TYP EXTERIOR BRG WALL - 2 x 6 HF No.2 @ 16" OC

ROOF FRAMING PLAN NOTES
- REFER TO GENERAL STRUCTURAL NOTES FOR ADDITIONAL INFORMATION.
- VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS.
- VERIFY SITE DATUM WITH ARCHITECTS DRAWINGS.
- CONTRACTOR SHALL VERIFY ALL FIELD DIMENSIONS PRIOR TO CONSTRUCTION.
- DETAILS ARE NOT CUT AT EVERY LOCATION THEY OCCUR. IF A CONDITION IS UNCLEAR, CONTACT ARCHITECT IMMEDIATELY BEFORE PROCEEDING.
- COORDINATE ALL OPENINGS THROUGH STRUCTURAL MEMBERS W/ ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND CIVIL DRAWINGS. TRIM OPENINGS AS SHOWN ON PLANS.
- SEE MECH, ELECT, AND CIVIL DRAWINGS FOR SLEEVE LOCATIONS. PIPES, CONDUITS AND OTHER PENETRATIONS NOT SHOWN SHALL NOT PASS THROUGH MASONRY WALLS AND COLUMNS, CONCRETE WALLS, BEAMS AND COLUMNS OR STEEL BEAMS OR COLUMNS WITHOUT PRIOR APPROVAL FROM STRUCTURAL ENGINEER OF RECORD.
- REFER TO ARCHITECTURAL DRAWINGS FOR FIRE RATING AND UL DESIGN NUMBER.
- FOR MISCELLANEOUS STEEL NOT SHOWN ON PLANS, SEE GENERAL STRUCTURAL NOTES AND GRAPHICAL GENERAL NOTES
- PRELIMINARY ELEVATIONS SHOWN ARE BASED ON INFORMATION PROVIDED BY THE ARCHITECT AND ARE SUBJECT TO CHANGE.
- TOP OF STEEL IS NOTED THUS (###'-## ###/##").
- SHEARWALLS SHOWN ARE FROM LEVEL BELOW TO PLAN LEVEL.
- REFER TO GRAPHICAL GENERAL NOTES FOR HEADERS, BEARING STUDS (T, TRIMMER STUDS) AND WIND STUDS (KS, KING STUDS). PROVIDE MINIMUM (2) 2x TRIMMER STUDS UNDER EACH BEAM OR HEADER AND (2) 2x KING STUDS EACH END WHERE NOT NOTED ON PLAN.
- WALL STUDS SHALL BE PER STUD SCHEDULE ON PLAN.
- STEEL BEAM SHEAR CONN SHALL BE PER GGN ST-16 UNO
- ROOF SHEATHING SHALL BE 23/32" PLYWOOD OR O.S.B. (48/24 RATING) ATTACHED TO FRAMING W/ 0.148ø NAILS SPACED AT 4" OC ALONG ALL PANEL EDGES AND 12" OC IN THE FIELD, MIN 1-1/2" PEN INTO FRAMING (UNBLOCKED)

FLOOR FRAMING PLAN NOTES
- REFER TO GENERAL STRUCTURAL NOTES FOR ADDITIONAL INFORMATION.
- VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS.
- VERIFY SITE DATUM WITH ARCHITECTS DRAWINGS.
- CONTRACTOR SHALL VERIFY ALL FIELD DIMENSIONS PRIOR TO CONSTRUCTION.
- DETAILS ARE NOT CUT AT EVERY LOCATION THEY OCCUR. IF A CONDITION IS UNCLEAR, CONTACT ARCHITECT IMMEDIATELY BEFORE PROCEEDING.
- COORDINATE ALL OPENINGS THROUGH STRUCTURAL MEMBERS W/ ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND CIVIL DRAWINGS. TRIM OPENINGS AS SHOWN ON PLANS.
- SEE MECH, ELECT, AND CIVIL DRAWINGS FOR SLEEVE LOCATIONS. PIPES, CONDUITS AND OTHER PENETRATIONS NOT SHOWN SHALL NOT PASS THROUGH MASONRY WALLS AND COLUMNS, CONCRETE WALLS, BEAMS AND COLUMNS OR STEEL BEAMS OR COLUMNS WITHOUT PRIOR APPROVAL FROM STRUCTURAL ENGINEER OF RECORD.
- REFER TO ARCHITECTURAL DRAWINGS FOR FIRE RATING AND UL DESIGN NUMBER.
- FOR MISCELLANEOUS STEEL NOT SHOWN ON PLANS, SEE GENERAL STRUCTURAL NOTES AND GRAPHICAL GENERAL NOTES
- PRELIMINARY ELEVATIONS SHOWN ARE BASED ON INFORMATION PROVIDED BY THE ARCHITECT AND ARE SUBJECT TO CHANGE.
- TOP OF STEEL IS NOTED THUS (###'-## ###/##").
- ALL COMPOSITE STEEL BEAMS ARE DESIGNED FOR UNSHORED CONSTRUCTION. DO NOT SHORE COMPOSITE BEAMS WITHOUT PERMISSION OF ENGINEER OF RECORD
- REFER TO GRAPHICAL GENERAL NOTES FOR HEADERS, BEARING STUDS (T, TRIMMER STUDS) AND WIND STUDS (KS, KING STUDS). PROVIDE MINIMUM (2) 2x TRIMMER STUDS UNDER EACH BEAM OR HEADER AND (2) 2x KING STUDS EACH END WHERE NOT NOTED ON PLAN.
- SHEARWALLS SHOWN ARE FROM LEVEL BELOW TO PLAN LEVEL.
- WALL STUDS SHALL BE PER STUD SCHEDULE ON PLAN
- STEEL BEAM SHEAR CONN SHALL BE PER GGN ST-16 UNO
- ROOF SHEATHING SHALL BE 23/32" PLYWOOD OR O.S.B. (48/24 RATING) ATTACHED TO FRAMING W/ 0.148ø NAILS SPACED AT 4" OC ALONG ALL PANEL EDGES AND 12" OC IN THE FIELD, MIN 1-1/2" PEN INTO FRAMING (UNBLOCKED)
- FLOOR SHEATHING SHALL BE 23/32" PLYWOOD OR O.S.B. (24 OC RATING) ATTACHED TO FRAMING W/ 0.148ø NAILS SPACED AT 4" OC ALONG ALL PANEL EDGES AND 12" OC IN THE FIELD, MIN 1-1/2" PEN INTO FRAMING (UNBLOCKED)

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

Studio NYL
2955 Baseline Road, #314
Boulder | Denver | Colorado Springs | Boston | Minneapolis
303.558.3145
www.studionyl.com

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21009

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

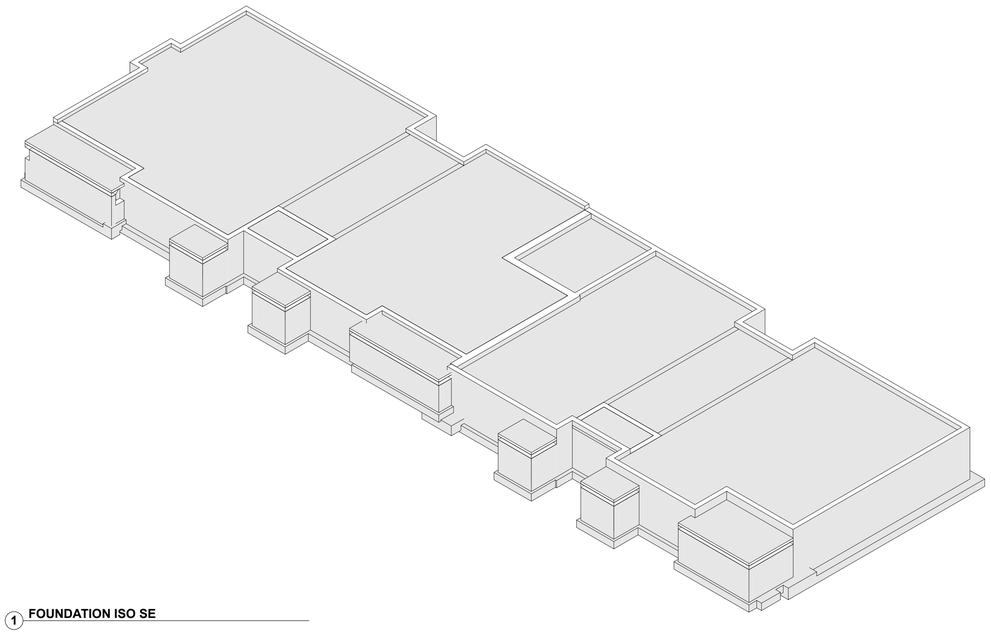
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

LEVEL 3 & ROOF PLAN - WEST BUILDING

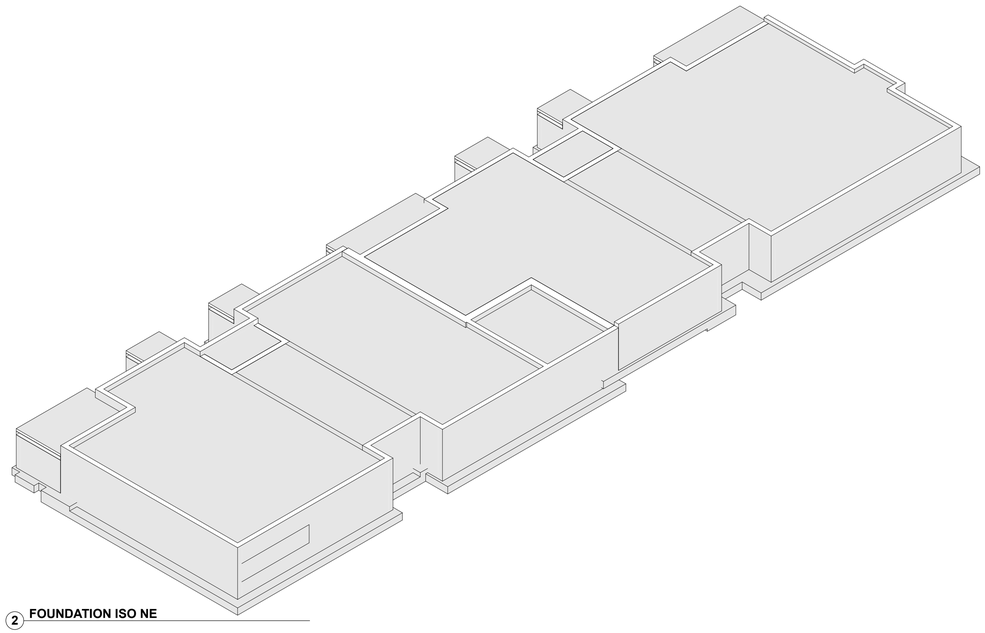
SW102

PLOT DATE: 3/22/2022 11:05:19 AM

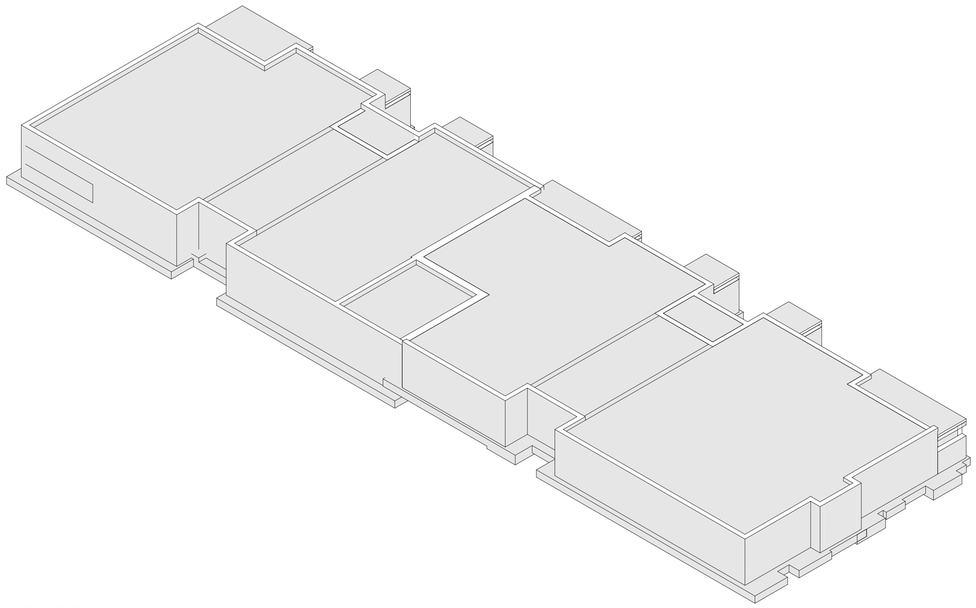
COPYRIGHT©



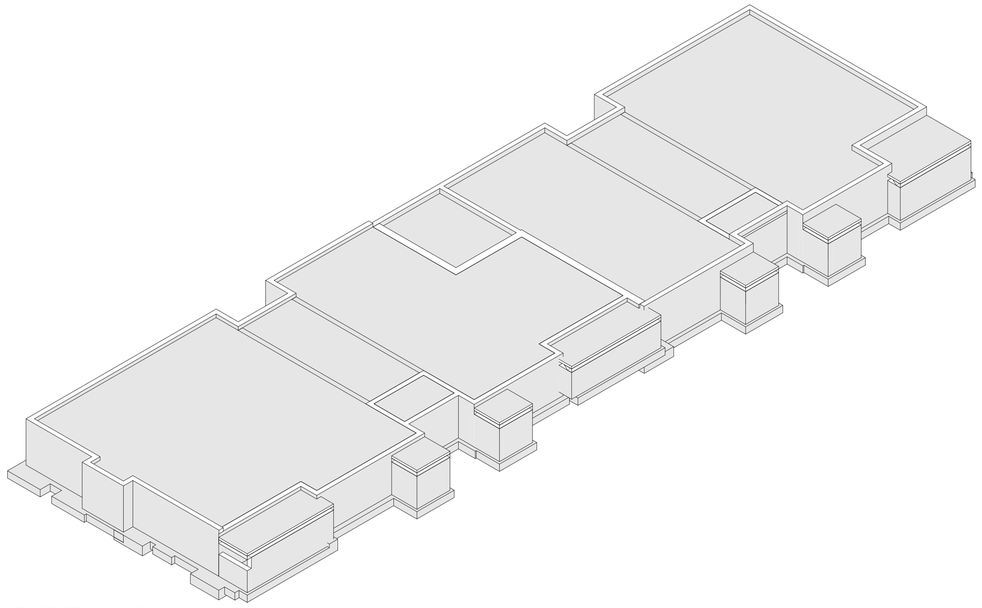
1 FOUNDATION ISO SE



2 FOUNDATION ISO NE



3 FOUNDATION ISO NW



4 FOUNDATION ISO SW

NOTE: ISO VIEWS ARE FOR GRAPHICAL REPRESENTATION ONLY. USE PLAN AND DETAIL INFO ONLY

PLOT DATE: 3/22/2022 11:05:20 AM

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

Studio NYL
2955 Basel ne Road, #314 303.558.3145
Boulder, Colorado 80303 www.studionyl.com
Boulder | Denver | Colorado Springs Boston | Minneapolis

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21009

Sheet Issue & Revision Log

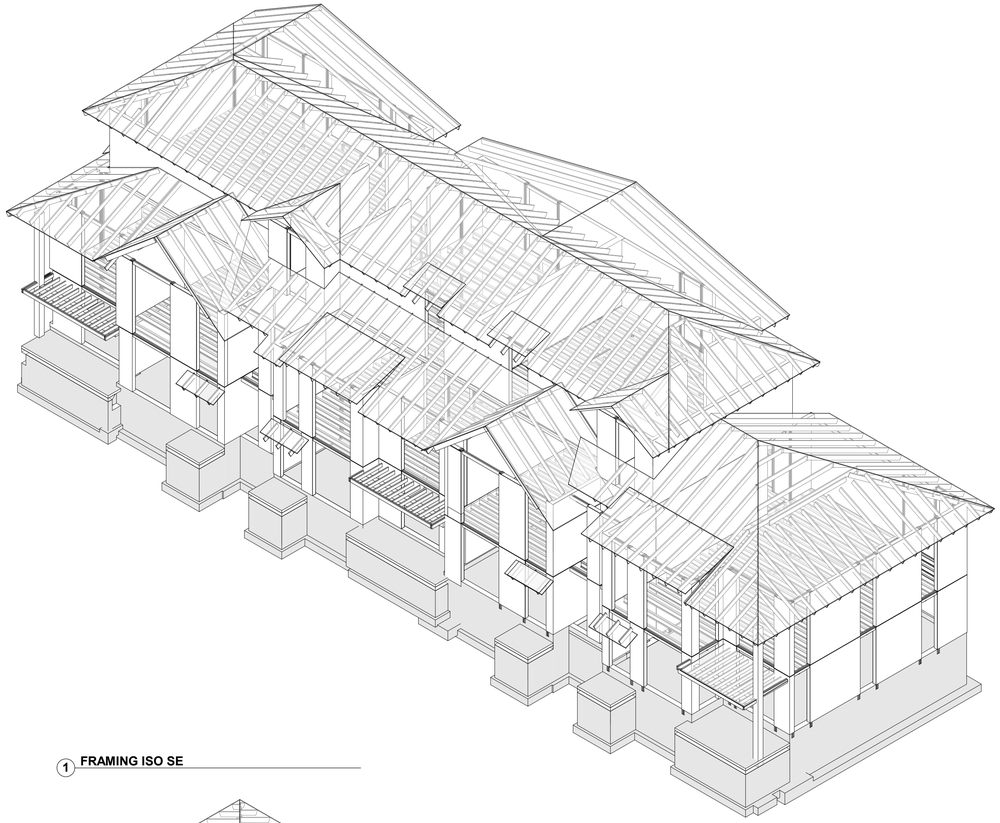
No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

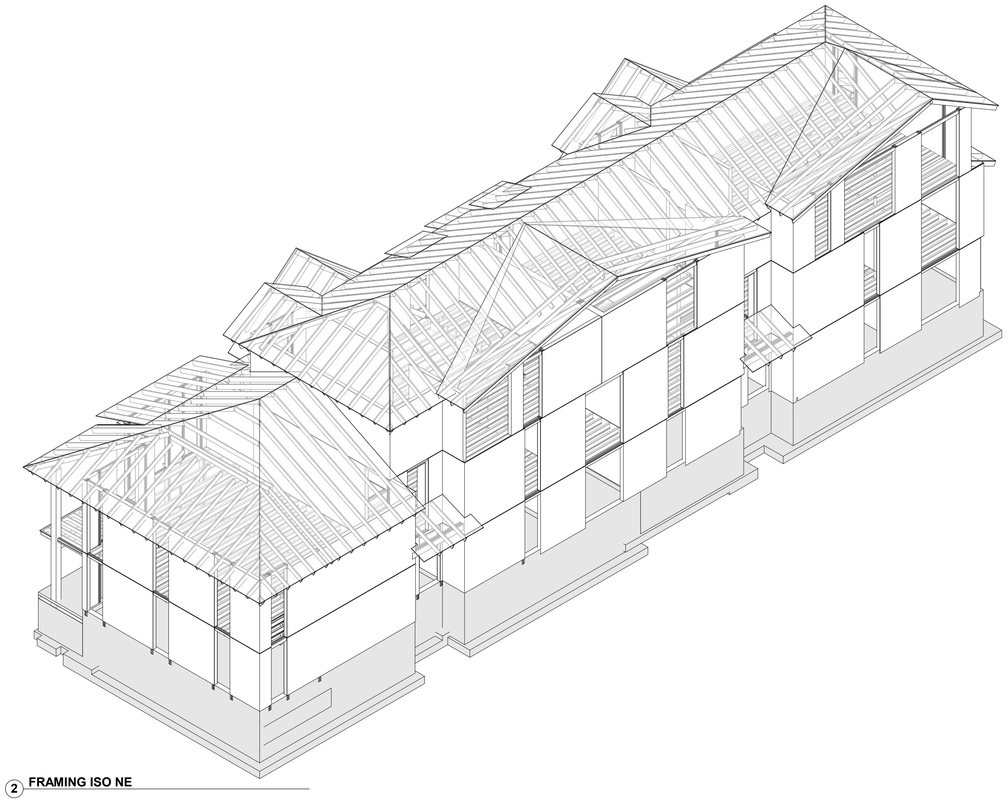
FOUNDATION ISOMETRIC VIEWS

SW201

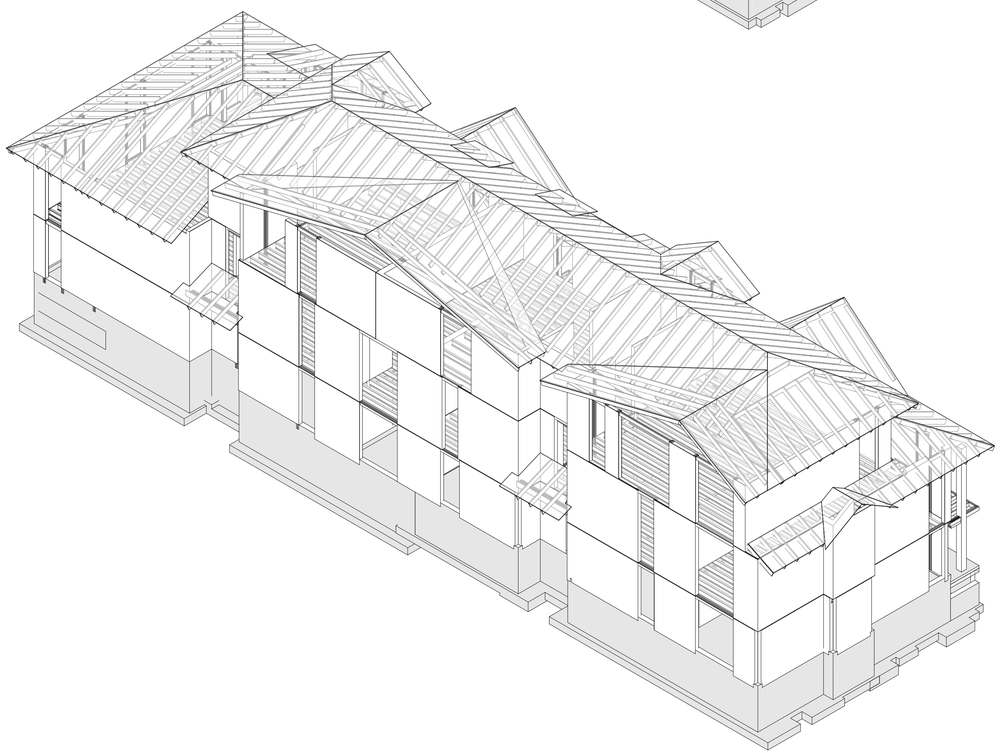
COPYRIGHT©



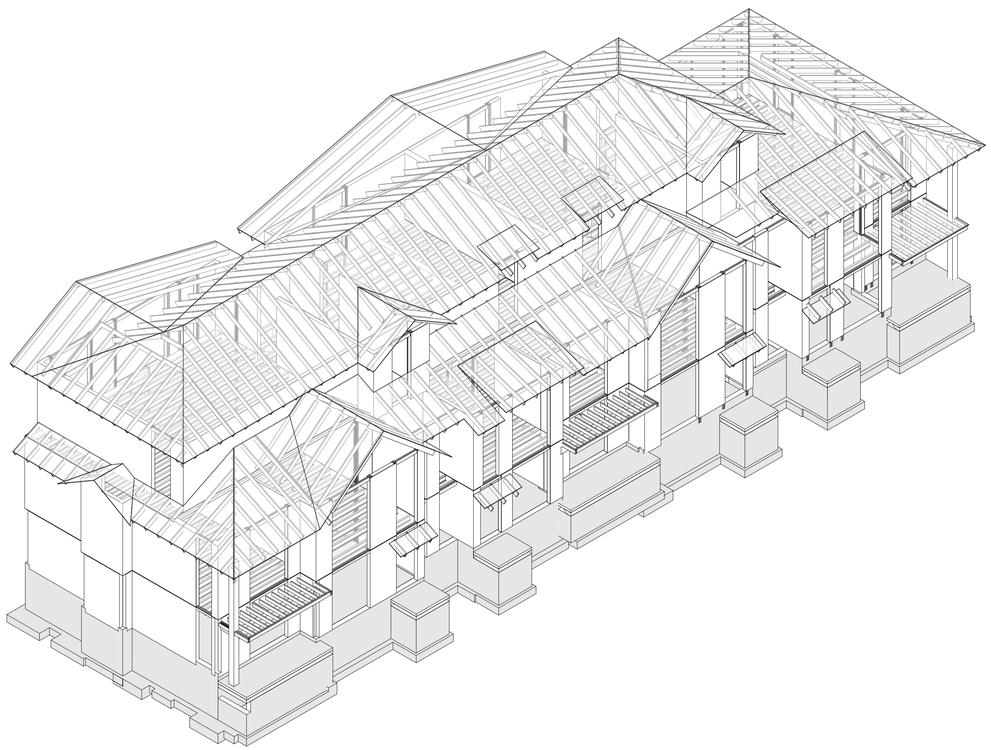
1 FRAMING ISO SE



2 FRAMING ISO NE



3 FRAMING ISO NW



4 FRAMING ISO SW

NOTE: ISO VIEWS ARE FOR GRAPHICAL REPRESENTATION ONLY. USE PLAN AND DETAIL INFO ONLY

PLOT DATE: 3/22/2022 11:05:23 AM

COPYRIGHT©

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

Studio NYL
2855 Basel ne Road, #314 303.558.3145
Bou der, Colorado 80303 www.stud onyl.com
Boulder | Denver | Colorado Springs Boston | Minneapolis

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21009

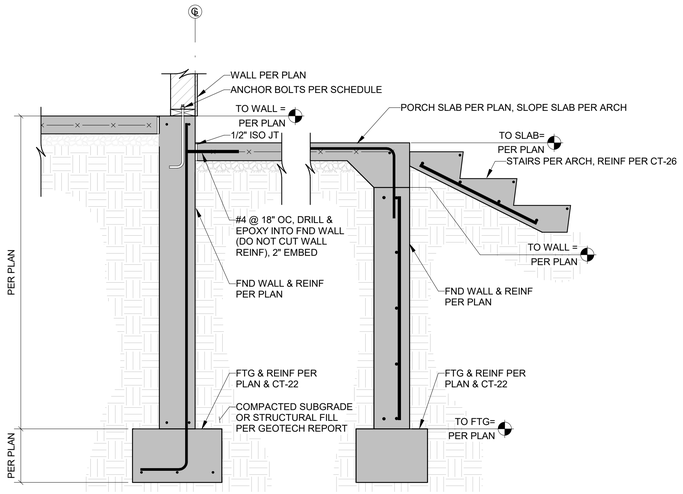
Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

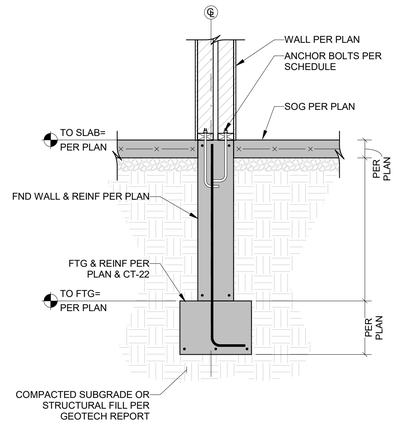
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

FRAMING ISOMETRIC VIEWS

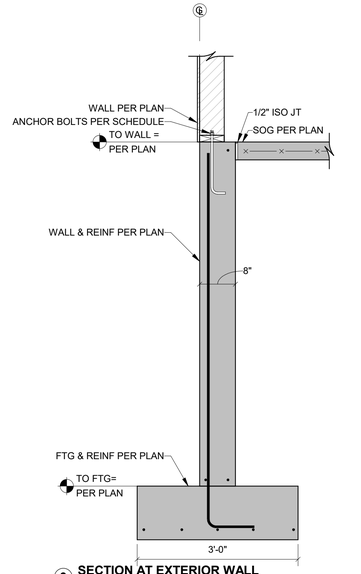
SW202



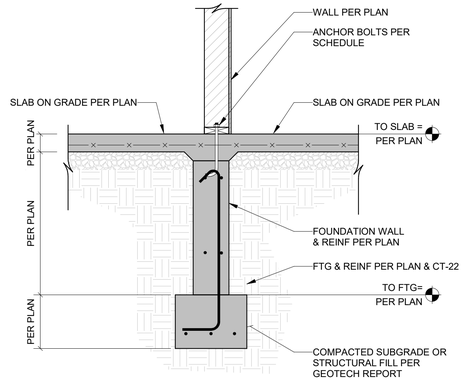
1 **SECTION AT ENTRANCE/ STAIR**
3/4" = 1'-0"



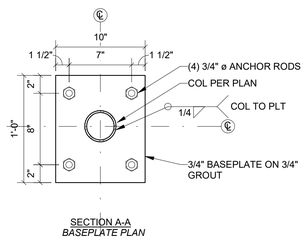
2 **SECTION AT DEMISING WALL**
3/4" = 1'-0"



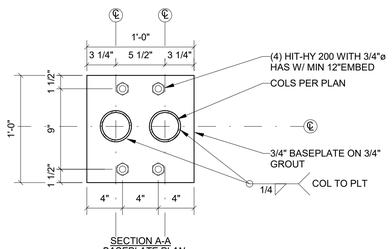
3 **SECTION AT EXTERIOR WALL**
3/4" = 1'-0"



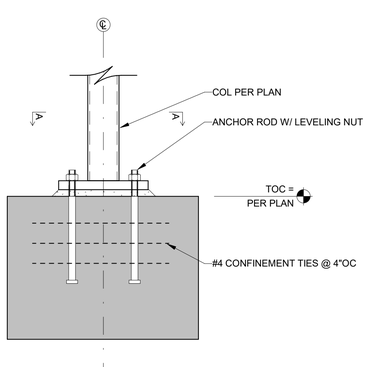
4 **INTERIOR BEARING WALL**
3/4" = 1'-0"



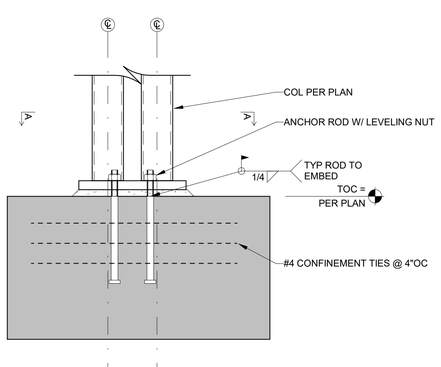
SECTION A-A
BASEPLATE PLAN



SECTION A-A
BASEPLATE PLAN



5 **BP-1**
1 1/2" = 1'-0"



6 **BP-2**
1 1/2" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

Studio NYL
2955 Basel ne Road, #314 303.558.3145
Boulder, Colorado 80303 www.studionyl.com
Boulder | Denver | Colorado Springs | Boston | Minneapolis

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21009

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

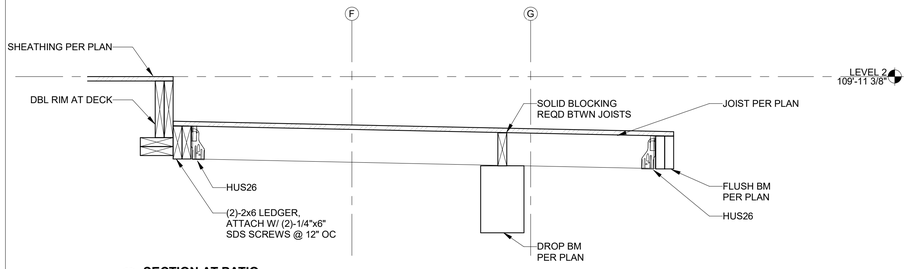
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

FOUNDATION DETAILS

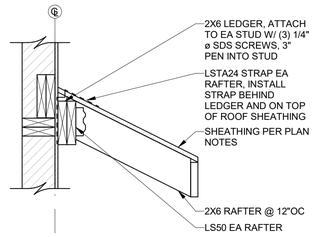
SW501

PLOT DATE: 3/22/2022 11:05:24 AM

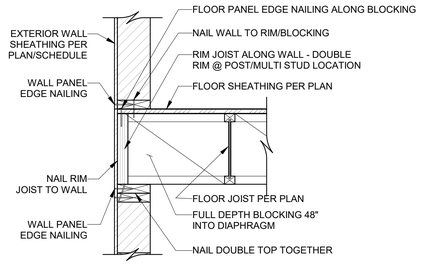
COPYRIGHT©



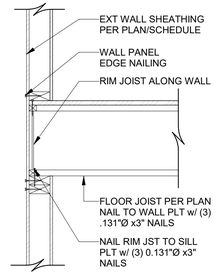
1 SECTION AT PATIO
1" = 1'-0"



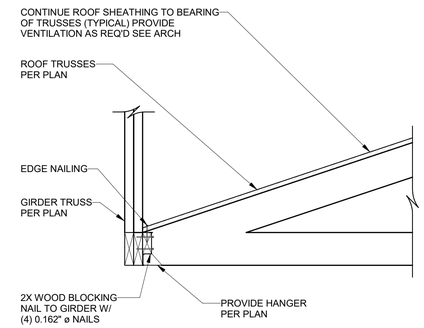
2 EYEBROW ROOF DETAIL
1" = 1'-0"



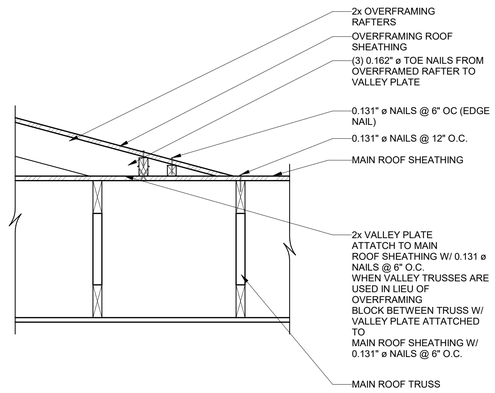
3 JOIST PARALLEL TO EXTERIOR BEARING WALL
1" = 1'-0"



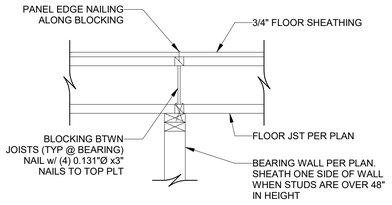
4 JOIST TO EXTERIOR WALL BEARING
1" = 1'-0"



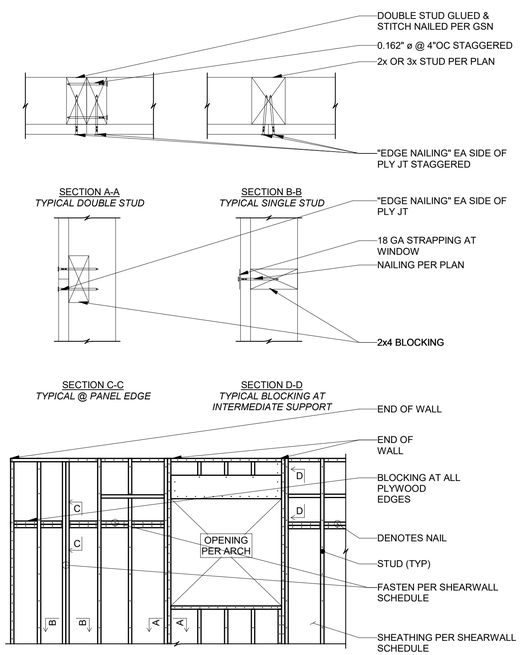
5 GIRDER TRUSS DETAIL
1" = 1'-0"



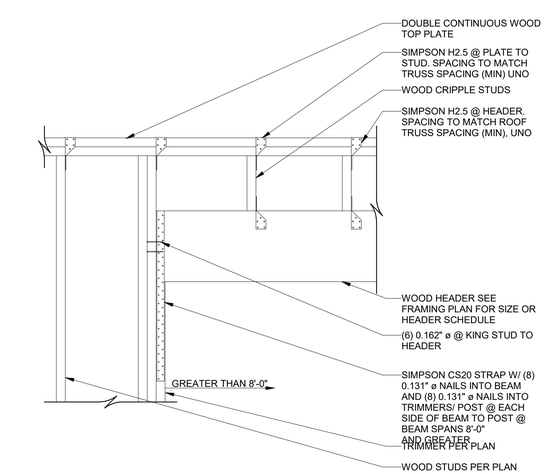
6 SHEAR TRANSFER - OVERFRAMING
1" = 1'-0"



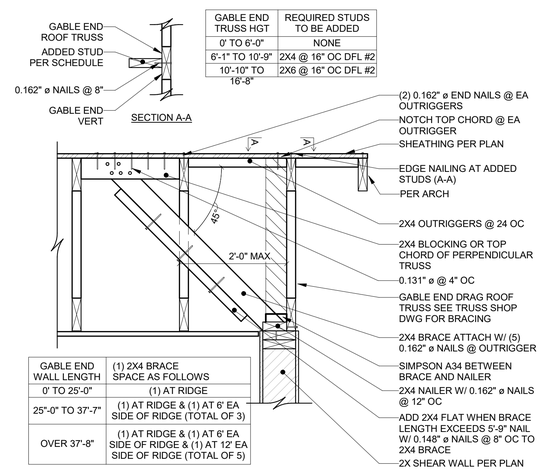
7 JOIST TO INTERIOR BEARING WALL
1" = 1'-0"



8 SHEARWALL ELEVATION
3/8" = 1'-0"



9 STRAPPING BEARING (ROOF ONLY)
NTS



GABLE END TRUSS HGT	REQUIRED STUDS TO BE ADDED
0' TO 6'-0"	NONE
6'-1" TO 10'-9"	2X4 @ 16" OC DFL #2
10'-10" TO 16'-8"	2X6 @ 16" OC DFL #2

GABLE END WALL LENGTH	(1) 2X4 BRACE SPACE AS FOLLOWS
0' TO 25'-0"	(1) AT RIDGE
25'-0" TO 37'-7"	(1) AT RIDGE & (1) AT 6' EA SIDE OF RIDGE (TOTAL OF 3)
OVER 37'-8"	(1) AT RIDGE & (1) AT 6' EA SIDE OF RIDGE & (1) AT 12' EA SIDE OF RIDGE (TOTAL OF 5)

10 GABLE END SHEAR TRANSFER
1" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

Studio NYL
2955 Basel ne Road, #314 303.558.3145
Boulder, Colorado 80303 www.studionyl.com

Boulder | Denver | Colorado Springs Boston | Minneapolis

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21009

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

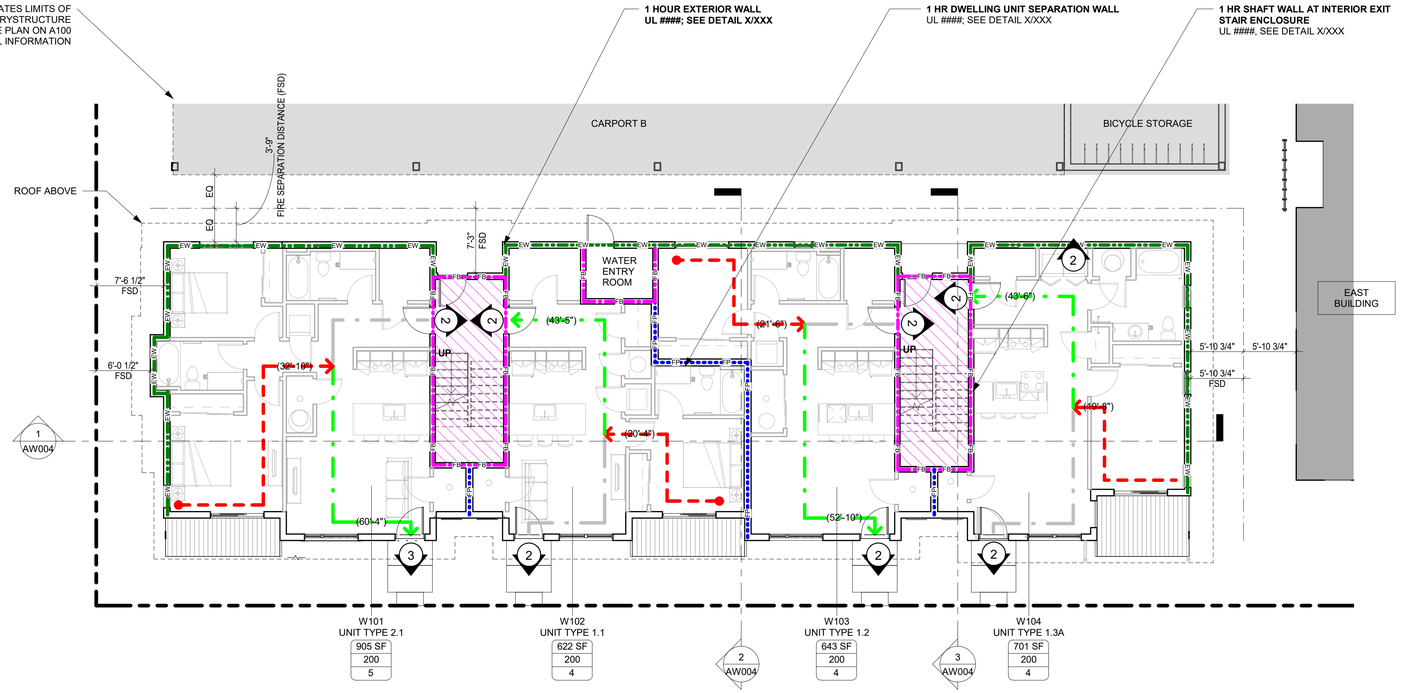
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

FRAMING DETAILS

SW502

PLOT DATE: 3/22/2022 11:05:24 AM

COPYRIGHT©



1 LEVEL 1 CODE PLAN - WEST BUILDING
1/8" = 1'-0"

GRAPHIC SCALE
0' 8' 16' 24' 32'

PLAN NORTH
TRUE NORTH

CODE SYMBOL LEGEND

- FP — FIRE PARTITION - 1 HR
- EW — EXTERIOR WALL - 1 HR
- FB — FIRE BARRIER - 1 HR
- HA — HORIZONTAL ASSEMBLY - 1 HR
- 10' — SEGMENT LENGTH — EGRESS PATH
- COMMON PATH OF TRAVEL
- SHAFT ENCLOSURE - 1 HR
- ROOF BELOW
- 101 — ROOM NUMBER
- Name — UNIT TYPE
- 3200 SF — TABULATED AREA
- 100 — OCCUPANCY LOAD FACTOR
- 5 — NUMBER OF OCCUPANTS
- 32 — NUMBER OF OCCUPANTS SERVED AT EXIT COMPONENT

COMMON PATH OF TRAVEL - 2018 IBC - WEST BUILDING		
COMMON PATH ID	MAX COMMON PATH OF TRAVEL DISTANCE	ACTUAL COMMON PATH DISTANCE
UNIT W101 COMMON PATH	125' - 0"	32' - 10"
UNIT W102 COMMON PATH	125' - 0"	20' - 4"
UNIT W103 COMMON PATH	125' - 0"	21' - 6"
UNIT W104 COMMON PATH	125' - 0"	19' - 8"
UNIT W201 COMMON PATH	125' - 0"	62' - 5"
UNIT W202 COMMON PATH	125' - 0"	51' - 7"
UNIT W203 COMMON PATH	125' - 0"	41' - 1"
UNIT W204 COMMON PATH	125' - 0"	51' - 4"
UNIT W301 COMMON PATH	125' - 0"	45' - 11"
UNIT W302 COMMON PATH	125' - 0"	28' - 2"
UNIT W303 COMMON PATH	125' - 0"	28' - 2"

EGRESS PATH OF TRAVEL - 2018 IBC - WEST BUILDING		
EGRESS PATH ID	MAX EGRESS PATH OF TRAVEL DISTANCE	TRAVEL DISTANCE PROVIDED
UNIT W101 EGRESS PATH	250' - 0"	60' - 4"
UNIT W102 EGRESS PATH	250' - 0"	43' - 5"
UNIT W103 EGRESS PATH	250' - 0"	52' - 10"
UNIT W104 EGRESS PATH	250' - 0"	43' - 6"

AREA SCHEDULE - OCCUPANCY - WEST BUILDING				
UNIT	AREA	AREA FUNCTION	OCCUPANT LOAD FACTOR	OCCUPANTS
LEVEL 1 WEST				
W101	905 SF	RESIDENTIAL	200	5
W102	622 SF	RESIDENTIAL	200	4
W103	643 SF	RESIDENTIAL	200	4
W104	701 SF	RESIDENTIAL	200	4
	2,871 SF			17
LEVEL 2 WEST				
W201	905 SF	RESIDENTIAL	200	5
W202	660 SF	RESIDENTIAL	200	4
W203	654 SF	RESIDENTIAL	200	4
W204	664 SF	RESIDENTIAL	200	4
	2,883 SF			17
LEVEL 3 WEST				
W301	639 SF	RESIDENTIAL	200	4
W302	466 SF	RESIDENTIAL	200	3
W303	466 SF	RESIDENTIAL	200	3
	1,570 SF			10
	7,324 SF			44

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

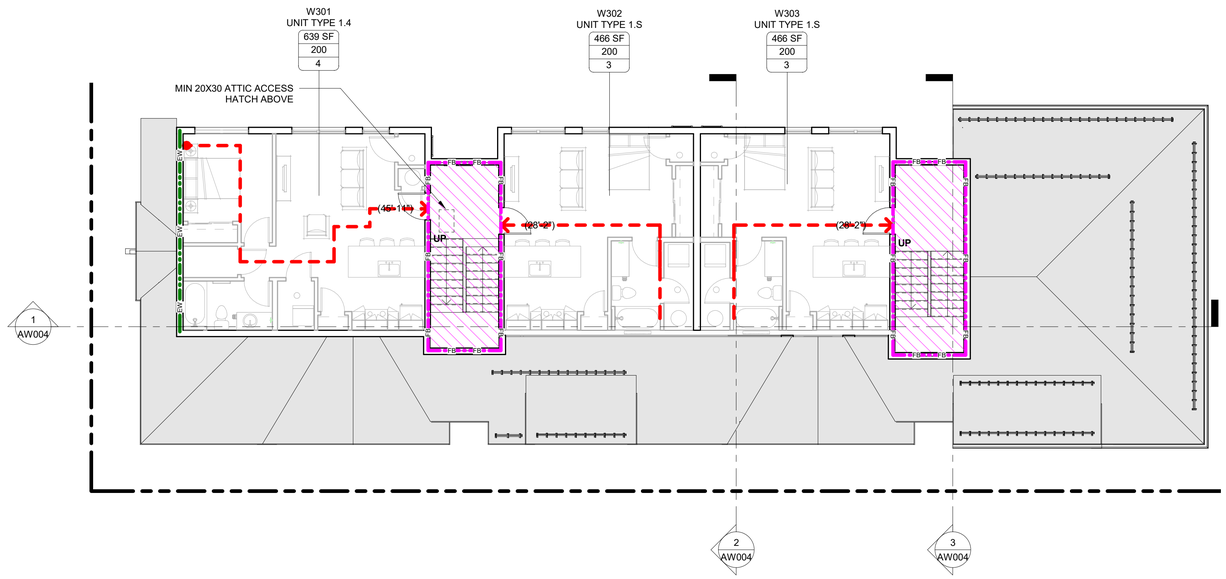
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

CODE PLAN LEVEL 1 - WEST BUILDING

AW001

PLOT DATE: 3/28/2022 3:03:43 PM

COPYRIGHT©

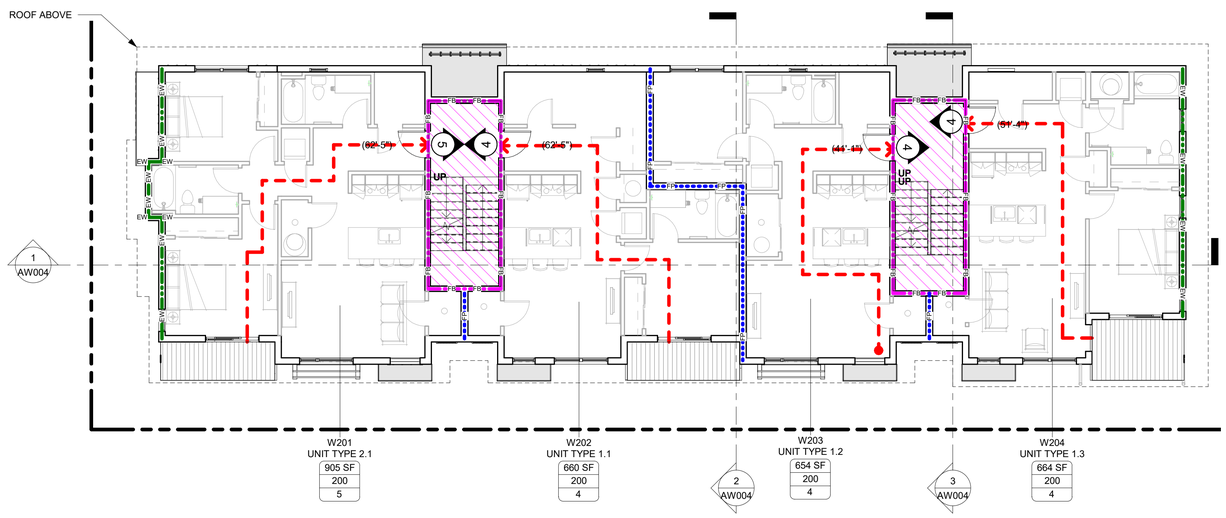


2 LEVEL 3 CODE PLAN - WEST BUILDING
1/8" = 1'-0"

GRAPHIC SCALE
0' 8' 16' 24' 32'

PLAN NORTH

TRUE NORTH



1 LEVEL 2 CODE PLAN - WEST BUILDING
1/8" = 1'-0"

GRAPHIC SCALE
0' 8' 16' 24' 32'

PLAN NORTH

TRUE NORTH

CODE SYMBOL LEGEND

- FIRE PARTITION - 1 HR
- EXTERIOR WALL - 1 HR
- FIRE BARRIER - 1 HR
- HORIZONTAL ASSEMBLY - 1 HR
- 10' SEGMENT LENGTH — EGRESS PATH
- COMMON PATH OF TRAVEL
- SHAFT ENCLOSURE - 1 HR
- ROOF BELOW
- 101 ROOM NUMBER; Name UNIT TYPE; 3200 SF TABULATED AREA; 100 OCCUPANCY LOAD FACTOR; 5 NUMBER OF OCCUPANTS
- 32 NUMBER OF OCCUPANTS SERVED AT EXIT COMPONENT

COMMON PATH OF TRAVEL - 2018 IBC - WEST BUILDING

COMMON PATH ID	MAX COMMON PATH OF TRAVEL DISTANCE	ACTUAL COMMON PATH DISTANCE
UNIT W101 COMMON PATH	125' - 0"	32' - 10"
UNIT W102 COMMON PATH	125' - 0"	20' - 4"
UNIT W103 COMMON PATH	125' - 0"	21' - 6"
UNIT W104 COMMON PATH	125' - 0"	19' - 8"
UNIT W201 COMMON PATH	125' - 0"	62' - 5"
UNIT W202 COMMON PATH	125' - 0"	51' - 7"
UNIT W203 COMMON PATH	125' - 0"	41' - 1"
UNIT W204 COMMON PATH	125' - 0"	51' - 4"
UNIT W301 COMMON PATH	125' - 0"	45' - 11"
UNIT W302 COMMON PATH	125' - 0"	28' - 2"
UNIT W303 COMMON PATH	125' - 0"	28' - 2"

EGRESS PATH OF TRAVEL - 2018 IBC - WEST BUILDING

EGRESS PATH ID	MAX EGRESS PATH OF TRAVEL DISTANCE	TRAVEL DISTANCE PROVIDED
UNIT W101 EGRESS PATH	250' - 0"	60' - 4"
UNIT W102 EGRESS PATH	250' - 0"	43' - 5"
UNIT W103 EGRESS PATH	250' - 0"	52' - 10"
UNIT W104 EGRESS PATH	250' - 0"	43' - 6"

AREA SCHEDULE - OCCUPANCY - WEST BUILDING

UNIT	AREA	AREA FUNCTION	OCCUPANT LOAD FACTOR	OCCUPANTS
LEVEL 1 WEST				
W101	905 SF	RESIDENTIAL	200	5
W102	622 SF	RESIDENTIAL	200	4
W103	643 SF	RESIDENTIAL	200	4
W104	701 SF	RESIDENTIAL	200	4
	2,871 SF			17
LEVEL 2 WEST				
W201	905 SF	RESIDENTIAL	200	5
W202	660 SF	RESIDENTIAL	200	4
W203	654 SF	RESIDENTIAL	200	4
W204	664 SF	RESIDENTIAL	200	4
	2,883 SF			17
LEVEL 3 WEST				
W301	639 SF	RESIDENTIAL	200	4
W302	466 SF	RESIDENTIAL	200	3
W303	466 SF	RESIDENTIAL	200	3
	1,570 SF			10
	7,324 SF			44

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

0" 1" THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

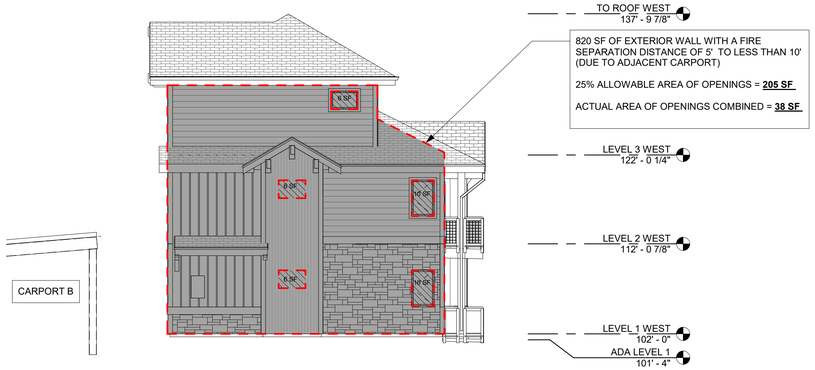
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

CODE PLANS LEVEL 2 & 3 - WEST BUILDING

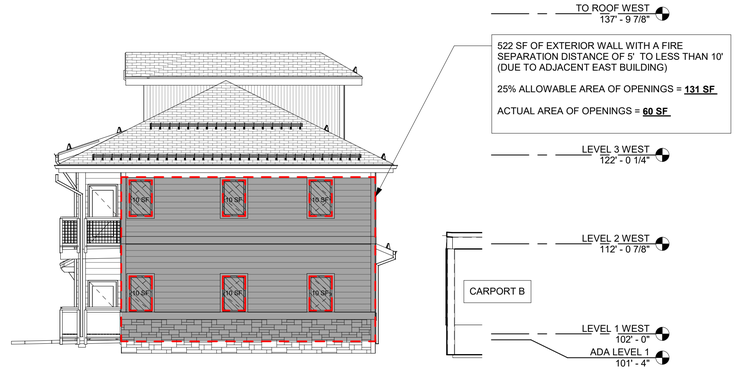
AW002

COPYRIGHT©

PLOT DATE: 3/28/2022 3:03:49 PM

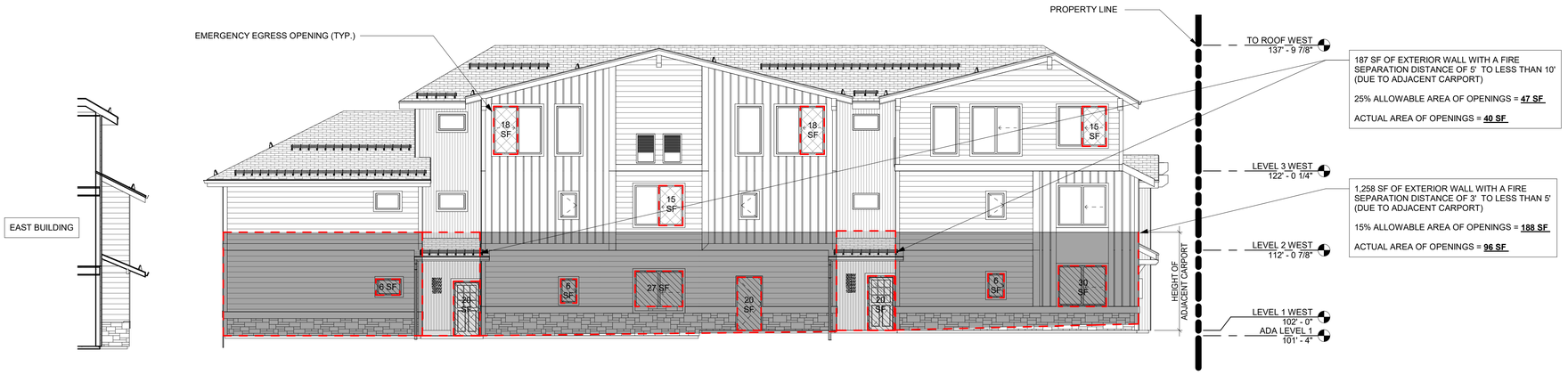


4 WEST ELEVATION - CODE - WEST BUILDING
1/8" = 1'-0"



1 EAST ELEVATION - CODE - WEST BUILDING
1/8" = 1'-0"

3 SOUTH ELEVATION - CODE - WEST BUILDING
1/8" = 1'-0"



2 NORTH ELEVATION - CODE - WEST BUILDING
1/8" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

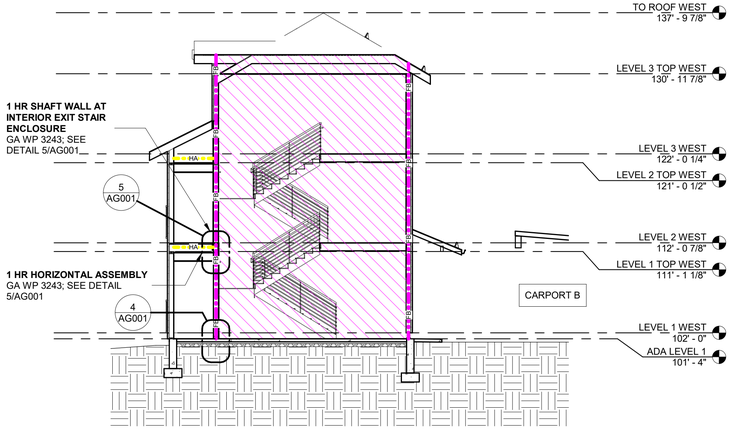
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

CODE ELEVATIONS - WEST BUILDING

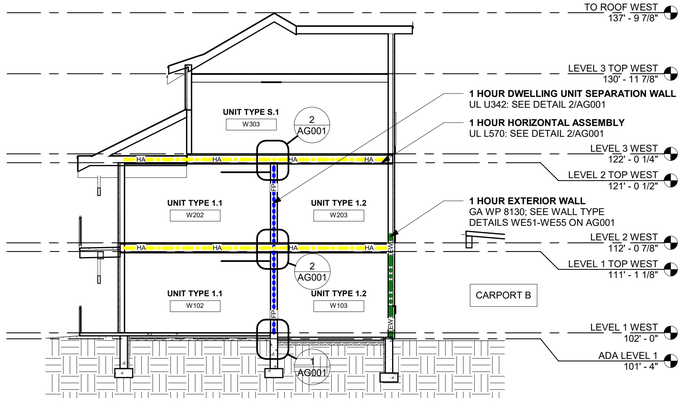
AW003

PLOT DATE: 3/28/2022 3:03:56 PM

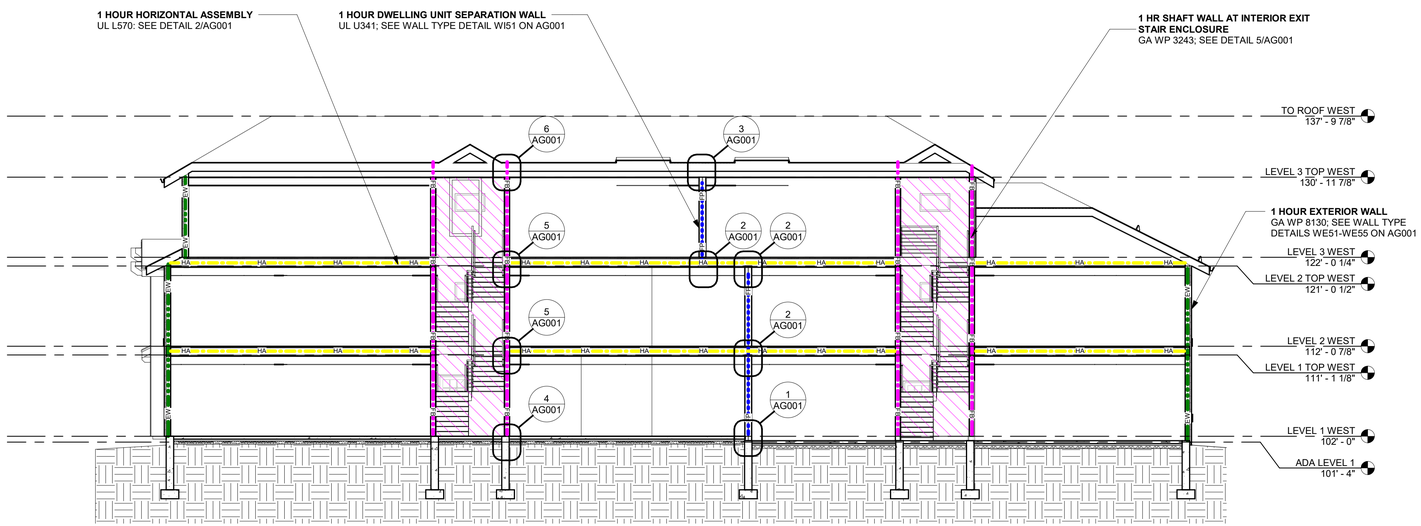
COPYRIGHT©



3 NORTH / SOUTH CODE SECTION - WEST BUILDING1
1/8" = 1'-0"



2 NORTH / SOUTH CODE SECTION - WEST BUILDING
1/8" = 1'-0"



1 EAST / WEST CODE SECTION - WEST BUILDING
1/8" = 1'-0"

CODE SYMBOL LEGEND

- FP — FIRE PARTITION - 1 HR
- EW — EXTERIOR WALL - 1 HR
- FB — FIRE BARRIER - 1 HR
- HA — HORIZONTAL ASSEMBLY - 1 HR
- 10' SEGMENT LENGTH — EGRESS PATH
- COMMON PATH OF TRAVEL
- SHAFT ENCLOSURE - 1 HR
- ROOF BELOW
- 101 / Name / 3200 SF / 100 / 5 — ROOM NUMBER, UNIT TYPE, TABULATED AREA, OCCUPANCY LOAD FACTOR, NUMBER OF OCCUPANTS
- 32 — NUMBER OF OCCUPANTS SERVED AT EXIT COMPONENT

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

0" 1" — THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

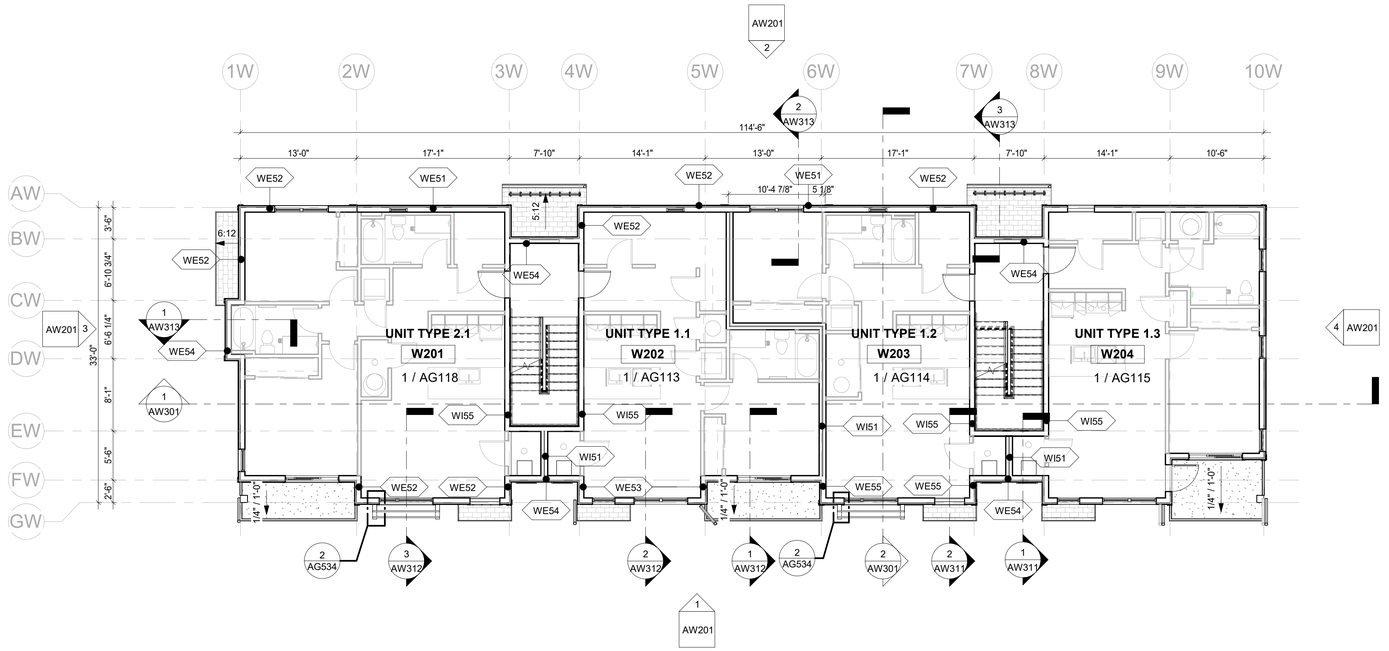
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

CODE SECTIONS - WEST BUILDING

AW004

PLOT DATE: 3/28/2022 3:03:59 PM

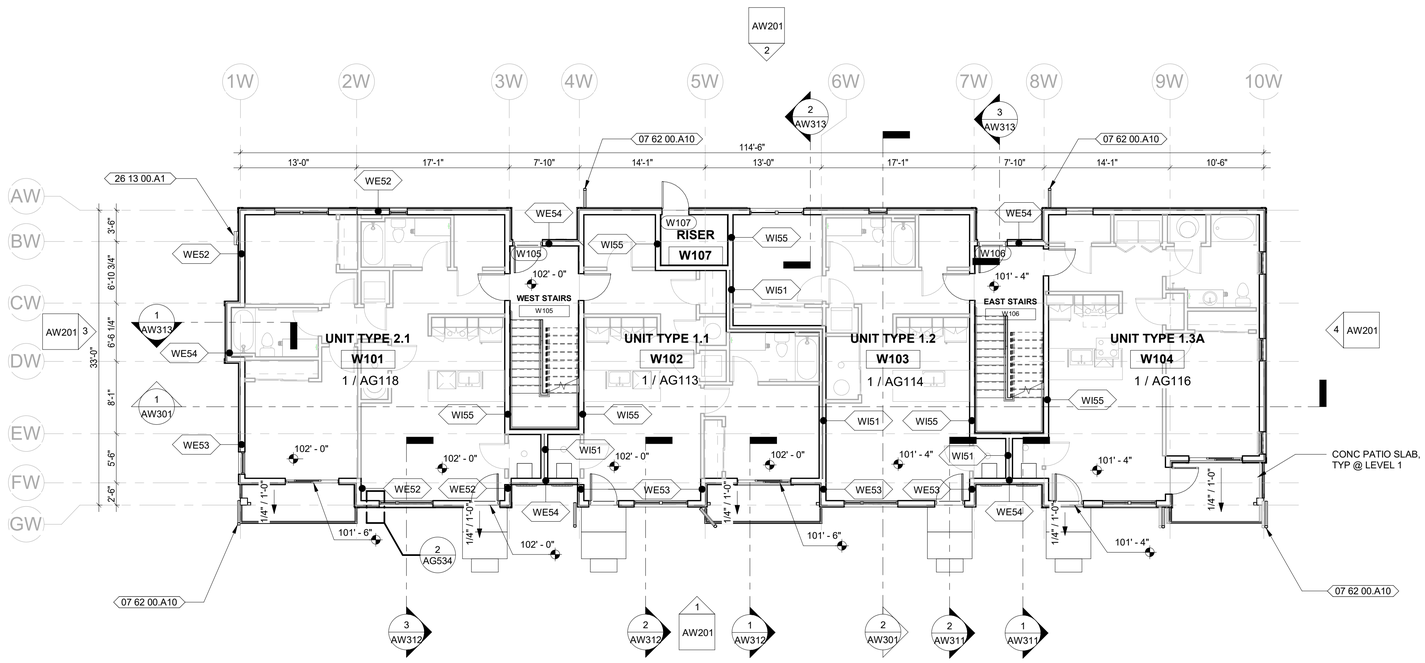
COPYRIGHT©



2 LEVEL 2 PLAN - WEST BUILDING
1/8" = 1'-0"

GRAPHIC SCALE
0 8 16 24 32

PLAN NORTH TRUE NORTH



1 LEVEL 1 PLAN - WEST BUILDING
1/8" = 1'-0"

GRAPHIC SCALE
0 8 16 24 32

PLAN NORTH TRUE NORTH

PLAN NOTES

1. ALL EXTERIOR DIMENSIONS ARE TO FACE OF STUD UNLESS NOTED OTHERWISE; FOF - FACE OF FINISH; CL - CENTERLINE ;FOS - FACE OF SHEATHING
2. ALL INTERIOR DIMENSIONS ARE TO FACE OF STUD UNLESS NOTED OTHERWISE; FOF - FACE OF FINISH; CL - CENTERLINE
3. TOP OF CONCRETE FLOOR (LEVEL ONE) IS DEFINED AS PROJECT EL. 100'-0" (ELEVATION 100'-0" EQUATES TO USGS DATUM ELEVATION OF 9043.5'.
4. WHERE DOORS IN WOOD STUD/GYPSUM BOARD PARTITIONS ARE NOT SPECIFICALLY LOCATED ON THE PLAN WITH DIMENSION STRINGS. PROVIDE A MINIMUM HINGE SIDE JAMB DIMENSION OF 4" FROM DOOR OPENING TO PERPENDICULAR WALLS. WHERE DOORS APPEAR TO BE CENTERED WITHIN CORRIDORS LOCATE THE DOORS IN THE CENTER OF THE CORRIDOR.
5. PROVIDE CONTINUOUS ACOUSTIC INSULATION AT ALL STUD WALLS COMMON TO FUTURE TENANT AREAS.
6. WHERE TWO DIFFERING PARTITION TYPES ABUT IN A LINE AND ALONG A CONTINUOUS LENGTH OF PARTITIONS, THE CONTINUOUS FINISHED SURFACES OF THESE PARTITIONS SHALL ALIGN UNLESS NOTED OTHERWISE.
7. IF FRAMING NEW NON-RATED PARTITIONS TO THE BOTTOM OF THE STRUCTURAL CEILING, AND THOSE PARTITIONS INTERSECT MECHANICAL EQUIPMENT, THEN FRAME AROUND THE MECHANICAL EQUIPMENT ALLOWING CLEARANCES FOR MAINTENANCE. DO NOT FRME TIGHT AGAINST ANY EQUIPMENT THAT MAY CAUSE VIBRATIONS IN THE PARTITION ASSEMBLY. PROVIDE 1/2" CLEARANCE FROM ALL DUCTWORK. NOTIFY ARCHITECT IF A RATED PARTITION INTERSECTS MECHANICAL EQUIPMENT.
8. THERE SHALL BE NO EXPOSED PIPE, DUCTS, ETC. ALL SUCH LINES SHALL BE CONCEALED OR FURRED, UNLESS NOTED AS EXPOSED CONSTRUCTION .
9. ALL INTERIOR PARTITIONS ARE TYPE WI52 UNLESS NOTED OTHERWISE. ALL EXTERIOR WALLS ARE TYPE WE51 UNLESS NOTED OTHERWISE. RATED WALLS ARE INDICATED ON THE CODE PLAN SHEETS. SEE SHEET G0.31 FOR PARTITION TYPES AND WIDTHS. WALL TYPES CONTINUE AROUND OUTSIDE CORNERS AND TERMINATE AT INSIDE CORNERS UNLESS INIDCATED OTHERWISE.
10. PROVIDE SLIP JOINT CONNECTIONS AT THE TOPS OF ALL PARTITIONS WHICH INTERSECT THE STRUCTURE ABOVE; PROVIDE FIRE SAFING AT ALL SLIP JOINT CONNECTIONS IN FIRE-RATED PARTITIONS SEE PARTITION TYPES FOR TYPICAL SLIP-JOINT CONNECTION DESIGN. IF AMOUNT OF DEFLECTION TO BE ACCOMODATED IS NOT INDICATED ON STRUCTURAL DRAWINGS, OBTAIN CLARIFICATION FROM ARCHITECT PRIOR TO PROCEEDING. .
11. WHERE MECHANICAL WORK PENETRATES ANY COMPONENT OF THE FIRE-RATED ASSEMBLY, PROVIDE THE APPROPRIATE FIRE AND/OR SMOKE DAMPERS.
12. DOOR ASSEMBLIES IN 1-HR RATED PARTITIONS ARE TO BE 20-MINUTE RATED UNLESS A HIGHER RATING IS INDICATED .
13. ALL WALLS ARE EITHER PARALLEL OR PERPENDICULAR UNLESS OTHERWISE NOTED. ALL ANGLED WALLS ARE MULTIPLES OF 45 DEGREES UNLESS NOTED OTHERWISE.
14. ALL OUTLETS SHOWN BACK-TO-BACK SHALL BE OFFSET A MINIMUM OF 6". A STUD SHALL SEPERATE OUTLETS IN ACOUSTIC PARTITIONS PROVIDE CEMENTITOUS BACKER UNITS AROUND ALL TILED SHOWER ENCLOSURES AND TUBS. PROVIDE WATER RESISTIVE GYPSUM BOARD AT TOILET ROOM WALLS. MAINTAIN REQUIRED FIRE RATING AT ALL PARTITIONS.
15. VERIFY EXACT LOCATION OF EQUIPMENT TO BE FURNISHED BY OTHERS PRIOR TO ROUGH-IN.

PLAN SYMBOLS AND HATCH LEGEND

1i	DOOR TAG
1t	WINDOW TAG
ROOM NAME 101	ROOM TAG
WE51	WALL TAG RE:ASSEMBLIES

KEYNOTES

KEY VALUE	KEYNOTE TEXT
07 62 00.A10	PREFINISHED METAL DOWNSPOUT WITH HEAT TRACE
26 13 00.A1	ELECTRICAL EQUIPMENT, RE: ELEC

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

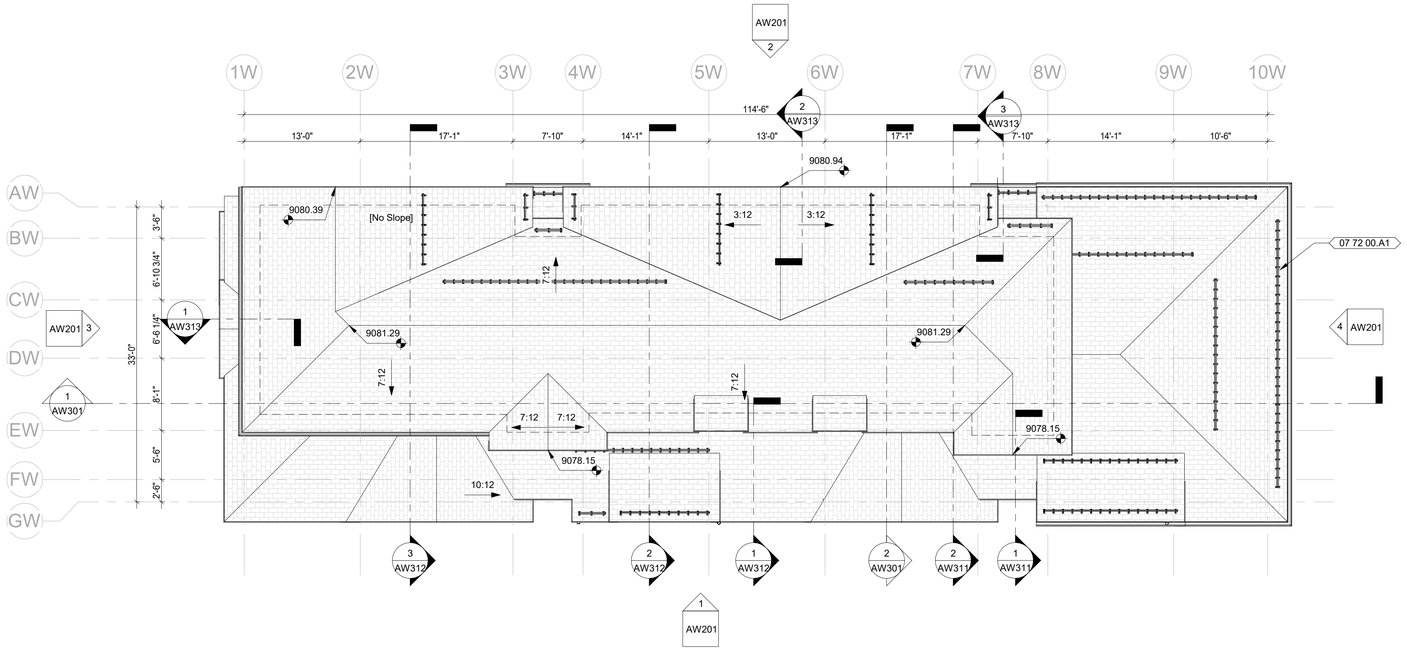
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

LEVEL 1 & 2 OVERALL FLOOR PLANS - WEST BUILDING

AW101

PLOT DATE: 3/28/2022 3:04:04 PM

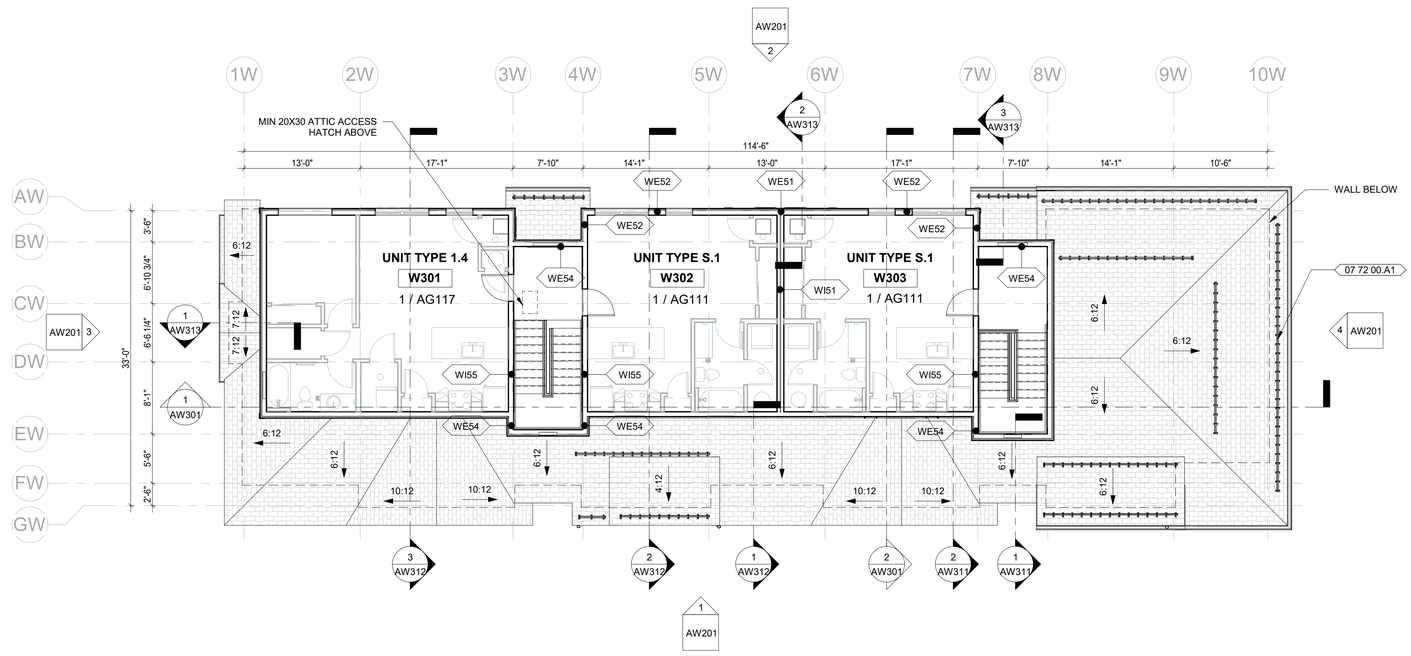
COPYRIGHT©



2 ROOF PLAN - WEST BUILDING
1/8" = 1'-0"

GRAPHIC SCALE
0 8 16 24 32

PLAN NORTH | TRUE NORTH



1 LEVEL 3 PLAN - WEST BUILDING
1/8" = 1'-0"

GRAPHIC SCALE
0 8 16 24 32

PLAN NORTH | TRUE NORTH

PLAN NOTES

1. ALL EXTERIOR DIMENSIONS ARE TO FACE OF STUD UNLESS NOTED OTHERWISE; FOF - FACE OF FINISH; CL - CENTERLINE ;FOS - FACE OF SHEATHING
2. ALL INTERIOR DIMENSIONS ARE TO FACE OF STUD UNLESS NOTED OTHERWISE; FOF - FACE OF FINISH; CL - CENTERLINE
3. TOP OF CONCRETE FLOOR (LEVEL ONE) IS DEFINED AS PROJECT EL. 100'-0" (ELEVATION 100'-0" EQUATES TO USGS DATUM ELEVATION OF 9043.5'.
4. WHERE DOORS IN WOOD STUD/GYPSUM BOARD PARTITIONS ARE NOT SPECIFICALLY LOCATED ON THE PLAN WITH DIMENSION STRINGS. PROVIDE A MINIMUM HINGE SIDE JAMB DIMENSION OF 4" FROM DOOR OPENING TO PERPENDICULAR WALLS. WHERE DOORS APPEAR TO BE CENTERED WITHIN CORRIDORS LOCATE THE DOORS IN THE CENTER OF THE CORRIDOR.
5. PROVIDE CONTINUOUS ACOUSTIC INSULATION AT ALL STUD WALLS COMMON TO FUTURE TENANT AREAS.
6. WHERE TWO DIFFERING PARTITION TYPES ABUT IN A LINE AND ALONG A CONTINUOUS LENGTH OF PARTITIONS, THE CONTINUOUS FINISHED SURFACES OF THESE PARTITIONS SHALL ALIGN UNLESS NOTED OTHERWISE.
7. IF FRAMING NEW NON-RATED PARTITIONS TO THE BOTTOM OF THE STRUCTURAL CEILING, AND THOSE PARTITIONS INTERSECT MECHANICAL EQUIPMENT, THEN FRAME AROUND THE MECHANICAL EQUIPMENT ALLOWING CLEARANCES FOR MAINTENANCE. DO NOT FRME TIGHT AGAINST ANY EQUIPMENT THAT MAY CAUSE VIBRATIONS IN THE PARTITION ASSEMBLY. PROVIDE 1/2" CLEARANCE FROM ALL DUCTWORK. NOTIFY ARCHITECT IF A RATED PARTITION INTERSECTS MECHANICAL EQUIPMENT.
8. THERE SHALL BE NO EXPOSED PIPE, DUCTS, ETC. ALL SUCH LINES SHALL BE CONCEALED OR FURRED, UNLESS NOTED AS EXPOSED CONSTRUCTION .
9. ALL INTERIOR PARTITIONS ARE TYPE WI52 UNLESS NOTED OTHERWISE. ALL EXTERIOR WALLS ARE TYPE WE51 UNLESS NOTED OTHERWISE. RATED WALLS ARE INDICATED ON THE CODE PLAN SHEETS. SEE SHEET G0.31 FOR PARTITION TYPES AND WIDTHS. WALL TYPES CONTINUE AROUND OUTSIDE CORNERS AND TERMINATE AT INSIDE CORNERS UNLESS INIDCATED OTHERWISE.
10. PROVIDE SLIP JOINT CONNECTIONS AT THE TOPS OF ALL PARTITIONS WHICH INTERSECT THE STRUCTURE ABOVE; PROVIDE FIRE SAFING AT ALL SLIP JOINT CONNECTIONS IN FIRE-RATED PARTITIONS SEE PARTITION TYPES FOR TYPICAL SLIP-JOINT CONNECTION DESIGN. IF AMOUNT OF DEFLECTION TO BE ACCOMODATED IS NOT INDICATED ON STRUCTURAL DRAWINGS, OBTAIN CLARIFICATION FROM ARCHITECT PRIOR TO PROCEEDING. .
11. WHERE MECHANICAL WORK PENETRATES ANY COMPONENT OF THE FIRE-RATED ASSEMBLY, PROVIDE THE APPROPRIATE FIRE AND/OR SMOKE DAMPERS.
12. DOOR ASSEMBLIES IN 1-HR RATED PARTITIONS ARE TO BE 20-MINUTE RATED UNLESS A HIGHER RATING IS INDICATED .
13. ALL WALLS ARE EITHER PARALLEL OR PERPENDICULAR UNLESS OTHERWISE NOTED. ALL ANGLED WALLS ARE MULTIPLES OF 45 DEGREES UNLESS NOTED OTHERWISE.
14. ALL OUTLETS SHOWN BACK-TO-BACK SHALL BE OFFSET A MINIMUM OF 6". A STUD SHALL SEPERATE OUTLETS IN ACOUSTIC PARTITIONS PROVIDE CEMENTITOUS BACKER UNITS AROUND ALL TILED SHOWER ENCLOSURES AND TUBS. PROVIDE WATER RESISTIVE GYPSUM BOARD AT TOILET ROOM WALLS. MAINTAIN REQUIRED FIRE RATING AT ALL PARTITIONS.
15. VERIFY EXACT LOCATION OF EQUIPMENT TO BE FURNISHED BY OTHERS PRIOR TO ROUGH-IN.

ROOF PLAN NOTES

A. DETAILED FLOOR AND ROOF TRUSS FRAMING DIAGRAMS ARE TO BE FURNISHED BY A STRUCTURAL ENGINEER LICENSED IN THE STATE WHERE THE PROJECT IS TO BE LOCATED.
B. THE TRUSS MANUFACTURER SHALL PROVIDE ENGINEERED PERMANENT ROOF TRUSS BRACING AS REQUIRED BY THE CODE.
C. LOCATE HIGH-POINT OF GUTTER AT MID-SPAN IN BETWEEN DOWNSPOUTS UNLESS INDICATED OTHERWISE ON THE ROOF PLAN.
D. DOWNSPOUTS TO DISCHARGE TO STORM DRAIN, RE: CIVIL
E. FRAMING SUB-CONTRACTOR AND PANEL MANUFACTURER TO REVIEW BUILDING SECTIONS TO ACCOMMODATE RATED WALL ASSEMBLIES. EXTEND ALL RATED PARTITIONS BETWEEN UNITS TO BOTTOM OF OUTER MOST ROOF PLANE, THROUGH SOFFITS, AND OVER-BUILD TO CREATE A CONTINUOUS PARTITION.
F. THE ENTIRE BUILDING ENVELOPE INCLUDING ROOF, WALLS, & FLOORS TO BE DRIED IN PRIOR TO THE STORAGE AND INSTALLATION OF INTERIOR FINISH MATERIALS. IN ADDITION, THE OWNER'S REPRESENTATIVE IS RESPONSIBLE FOR VERIFYING THAT THERE HAS BEEN NO EVIDENCE OF WATER PENETRATING THE BUILDING ENVELOPE OR WATER LEAK FROM MECHANICAL AND/OR FIRE SPRINKLER SYSTEMS PRIOR TO ENCLOSING THE WALL, CEILING OR ROOF CAVITIES.
G. PROVIDE ICE & WATER SHIELD AROUND ALL PENETRATIONS.
H. TRUSS MANUFACTURER TO COORDINATE ROOF TRUSSES WITH ARCH. TO INCLUDE SUFFICIENT HEEL HEIGHT TO ACCOMMODATE FULL DEPTH OF REQUIRED INSULATION.
I. PROVIDE (2) LAYERS OF ICE AND WATER SHIELD OVER ALL ROOFS
J. ROOF COVERING TO BE A MINIMUM CLASS B
K. PROVIDE HEAT TRACE AT ALL GUTTERS, DOWNSPOUTS, AND ABOVE ALL ROOF SOFFITS TO A MINIMUM OF 6" PAST THE WALL BELOW

PLAN SYMBOLS AND HATCH LEGEND

1i	DOOR TAG
1t	WINDOW TAG
ROOM NAME 101	ROOM TAG
WE51	WALL TAG RE:ASSEMBLIES

KEYNOTES

KEY VALUE	KEYNOTE TEXT
07 72 00.A1	POWDER COATED DECK-MOUNTED SNOW FENCE SYSTEM, DESIGNED BY OTHERS

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

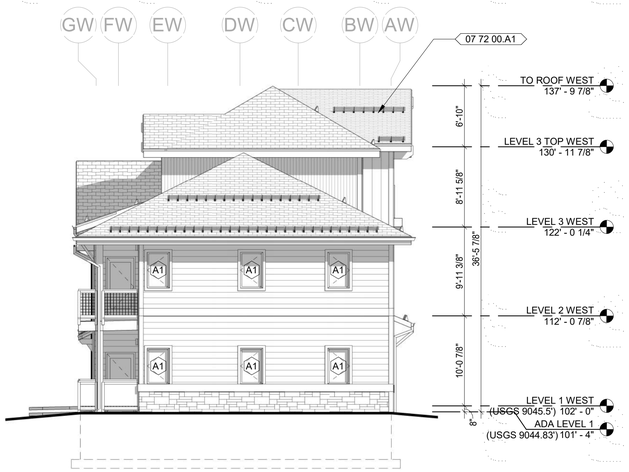
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

LEVEL 3 & ROOF OVERALL PLANS - WEST BUILDING

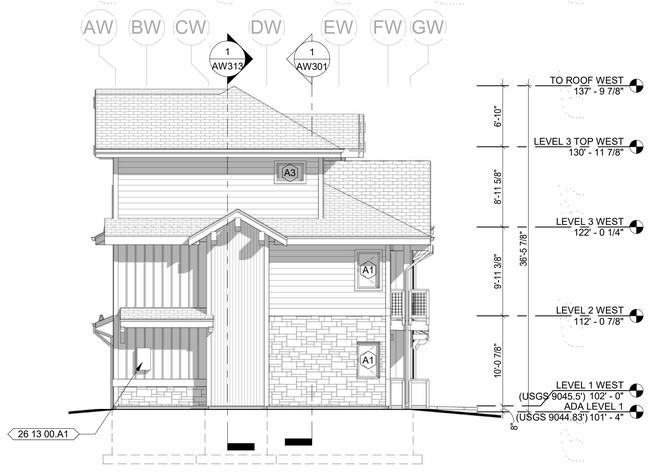
AW102

PLOT DATE: 3/28/2022 3:04:08 PM

COPYRIGHT©

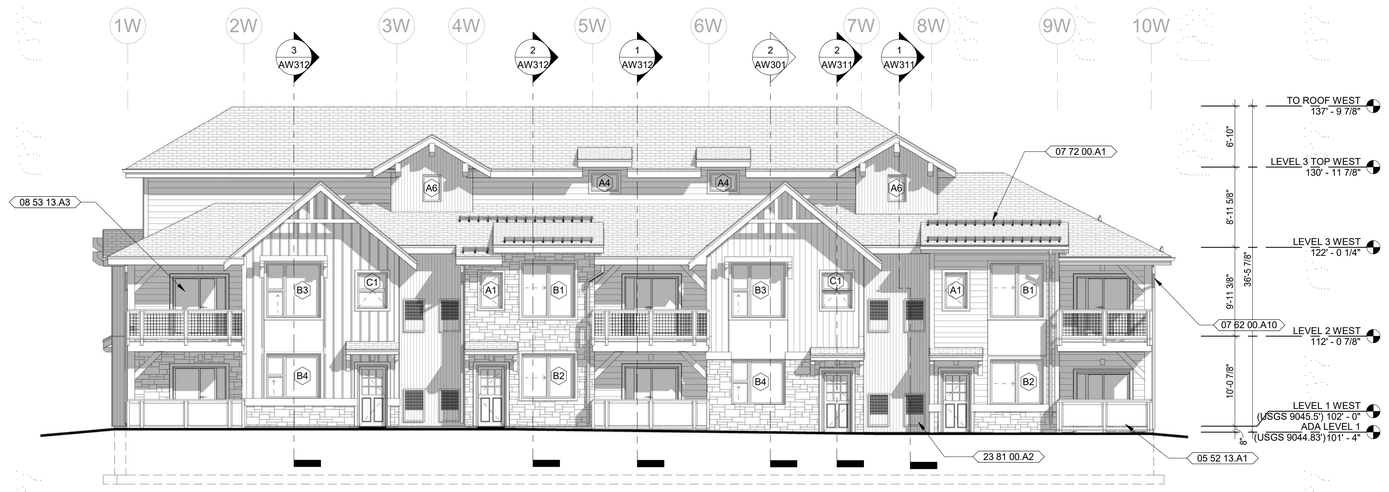


4 EAST ELEVATION - WEST BUILDING
1/8" = 1'-0"



3 WEST ELEVATION - WEST BUILDING
1/8" = 1'-0"

2 NORTH ELEVATION - WEST BUILDING
1/8" = 1'-0"



1 SOUTH ELEVATION - WEST BUILDING
1/8" = 1'-0"

ELEVATION LEGEND

- BOARD AND BATTEN SIDING
- VERTICAL WOOD SIDING
- HORIZONTAL LAP SIDING
- VERTICAL CORRUGATED METAL
- ASPHALT SHINGLES
- STONE VENEER

KEYNOTES

KEY VALUE	KEYNOTE TEXT
05 52 13.A1	PAINTED WOOD RAILING WITH POWDER COATED WELDED-WIRE MESH RAILING PANELS
07 62 00.A10	PREFINISHED METAL DOWNSPOUT WITH HEAT TRACE
07 72 00.A1	POWDER COATED DECK-MOUNTED SNOW FENCE SYSTEM, DESIGNED BY OTHERS
08 53 13.A3	SLIDING VINYL PATIO DOOR
10 14 00.A1	POWDER COATED METAL UNIT NUMBERS, REFLECTIVE
23 81 00.A2	VTAC UNIT, RE: MECH
26 13 00.A1	ELECTRICAL EQUIPMENT, RE: ELEC
26 50 00.A10	EXTERIOR LIGHT SCONCE, RE: ELEC

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

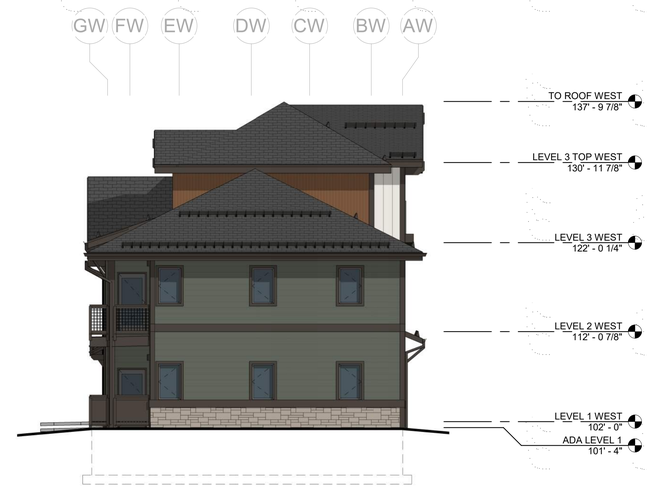
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

BUILDING ELEVATIONS - WEST BUILDING

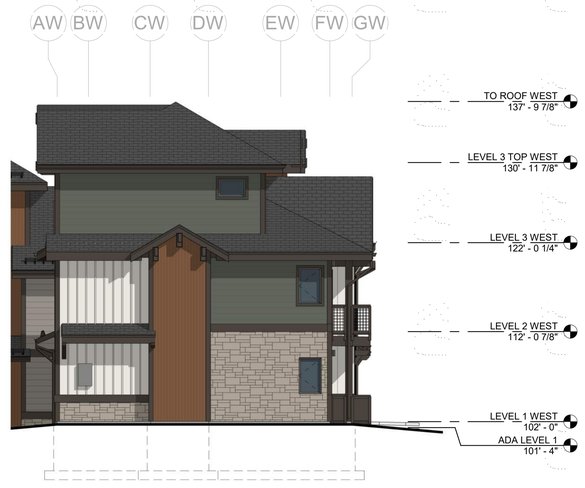
AW201

PLOT DATE: 3/28/2022 3:04:25 PM

COPYRIGHT©



4 EAST ELEVATION - COLOR - WEST BUILDING
1/8" = 1'-0"



3 WEST ELEVATION - COLOR - WEST BUILDING
1/8" = 1'-0"

2 NORTH ELEVATION - COLOR - WEST BUILDING
1/8" = 1'-0"

1 SOUTH ELEVATION - COLOR - WEST BUILDING
1/8" = 1'-0"

ELEVATION LEGEND

- BOARD AND BATTEN SIDING
- VERTICAL WOOD SIDING
- HORIZONTAL LAP SIDING
- VERTICAL CORRUGATED METAL
- ASPHALT SHINGLES
- STONE VENEER

EXTERIOR COLORS - WEST

- ROOFING - CHARCOAL
- COLOR 1 - SHERWIN WILLIAMS "PEWTER GREEN"
- COLOR 2 - SHERWIN WILLIAMS "EIDER WHITE"
- COLOR 3 - SHERWIN WILLIAMS "SEALSKIN"
- COLOR 4 - SHERWIN WILLIAMS "WATERLOO"
- VERTICAL WOOD SIDING
- VERTICAL CORRUGATED METAL - MATTE FINISH
- STONE ELDORADO CLIFFSTONE "WHITEBARK"

KEYNOTES

KEY VALUE	KEYNOTE TEXT

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

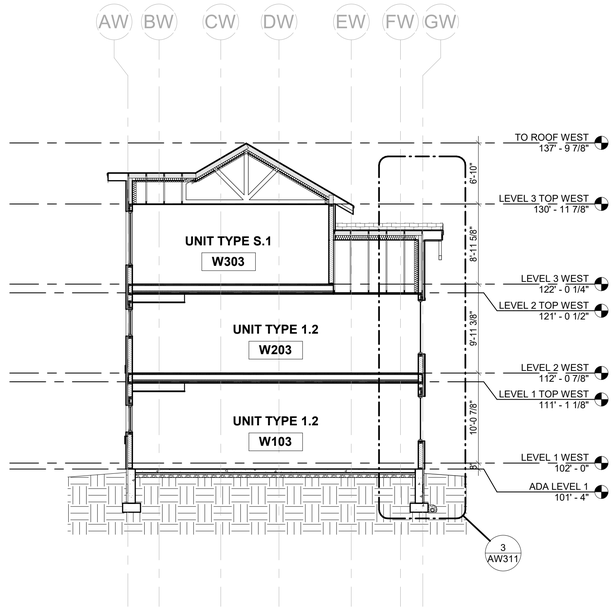
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

COLORED ELEVATIONS - WEST BUILDING

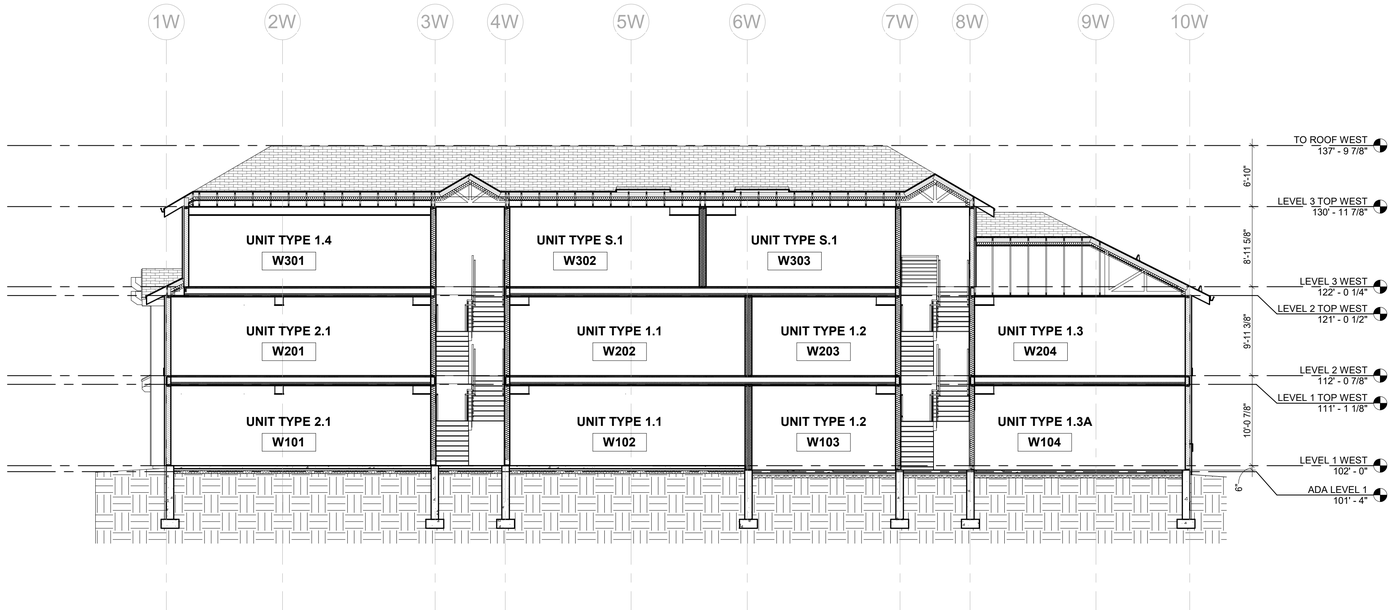
AW221

PLOT DATE: 3/28/2022 3:04:39 PM

COPYRIGHT©



2 TRANSVERSE BUILDLING SECTION - WEST BUILDING
1/8" = 1'-0"



1 LONGITUDINAL BUILDING SECTION - WEST BUILDING
1/8" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

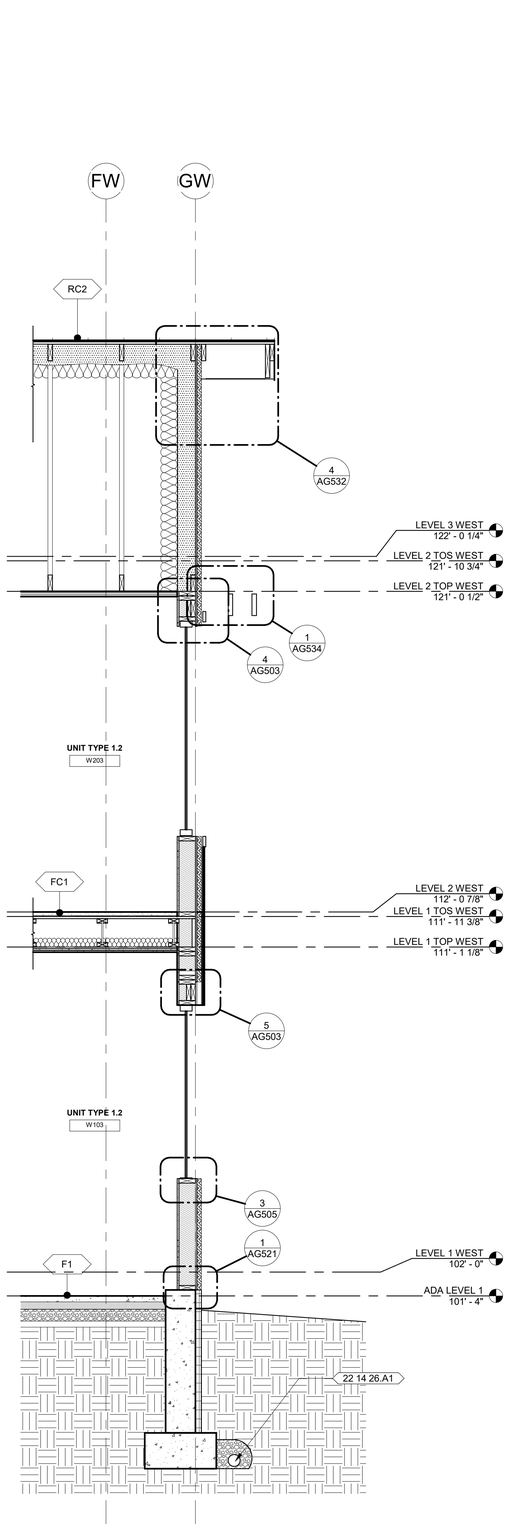
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

BUILDING SECTIONS - WEST BUILDING

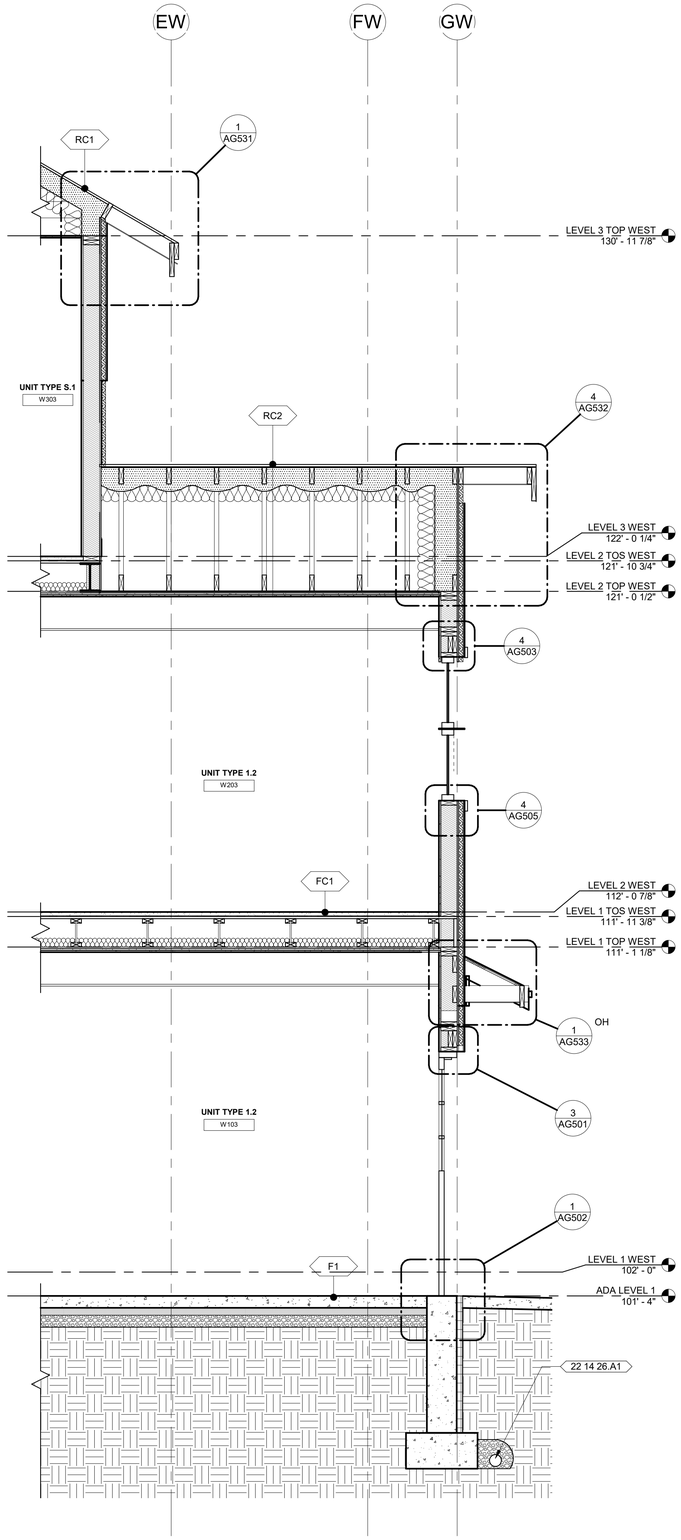
AW301

PLOT DATE: 3/28/2022 3:04:41 PM

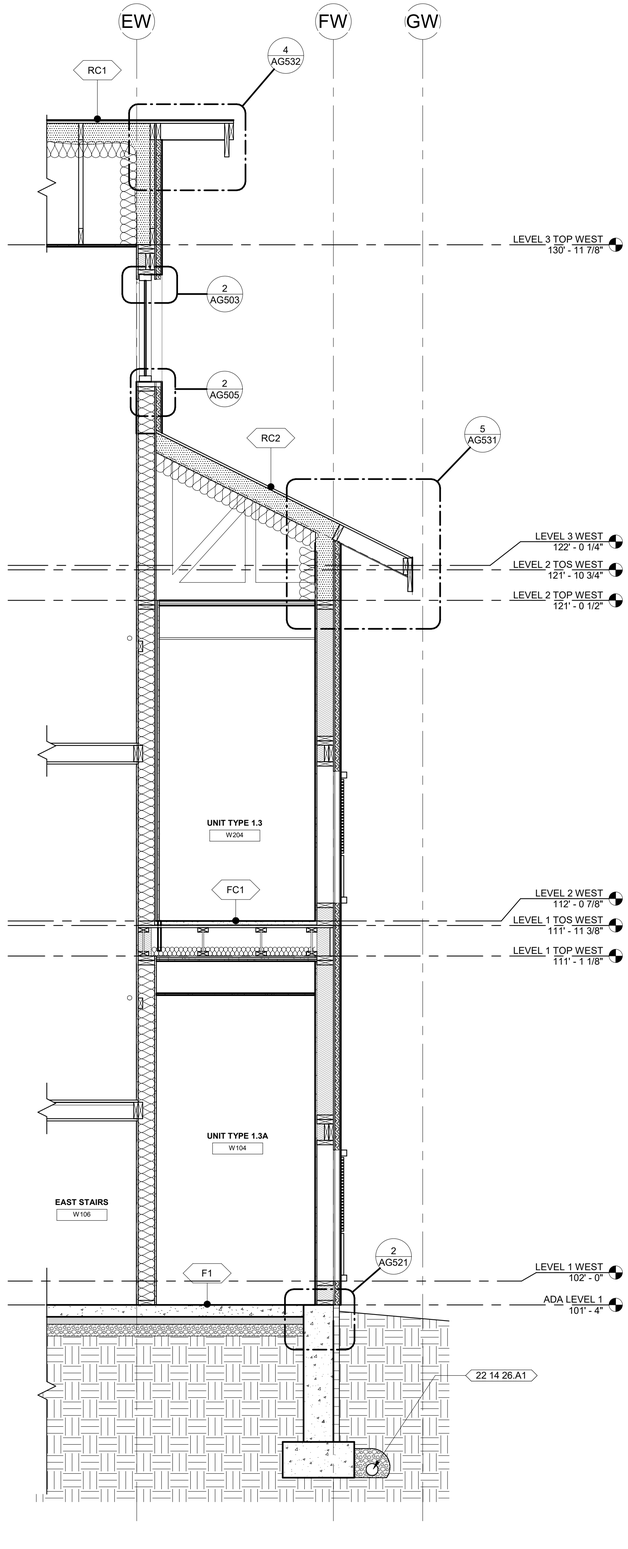
COPYRIGHT©



3 WALL SECTION 3 - WEST BUILDING
1/2" = 1'-0"



2 WALL SECTION 2 - WEST BUILDING
1/2" = 1'-0"



1 WALL SECTION 1 - WEST BUILDING
1/2" = 1'-0"

KEYNOTES

KEY VALUE	KEYNOTE TEXT
22 14 26.A1	STORM DRAIN, RE: CIVIL

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

WALL SECTIONS - WEST BUILDING

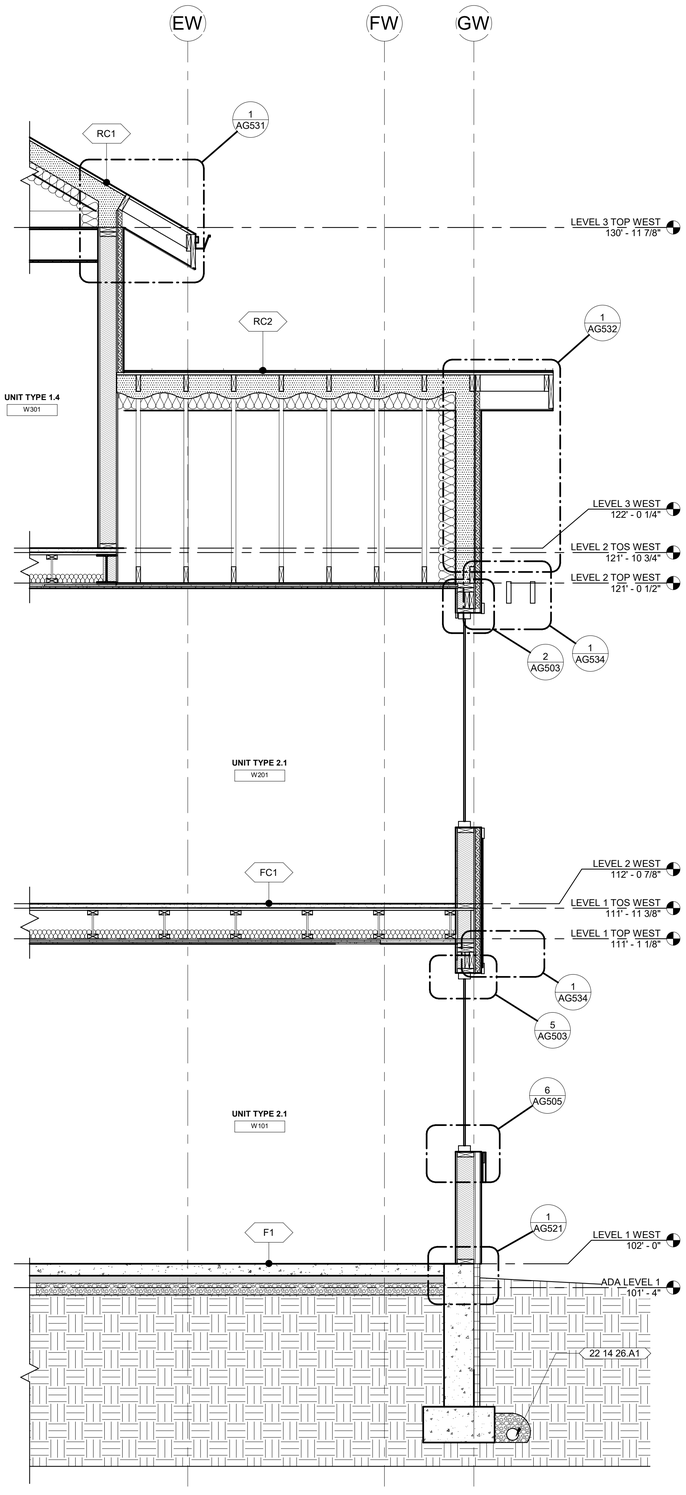
AW311

PLOT DATE: 3/28/2022 3:04:44 PM

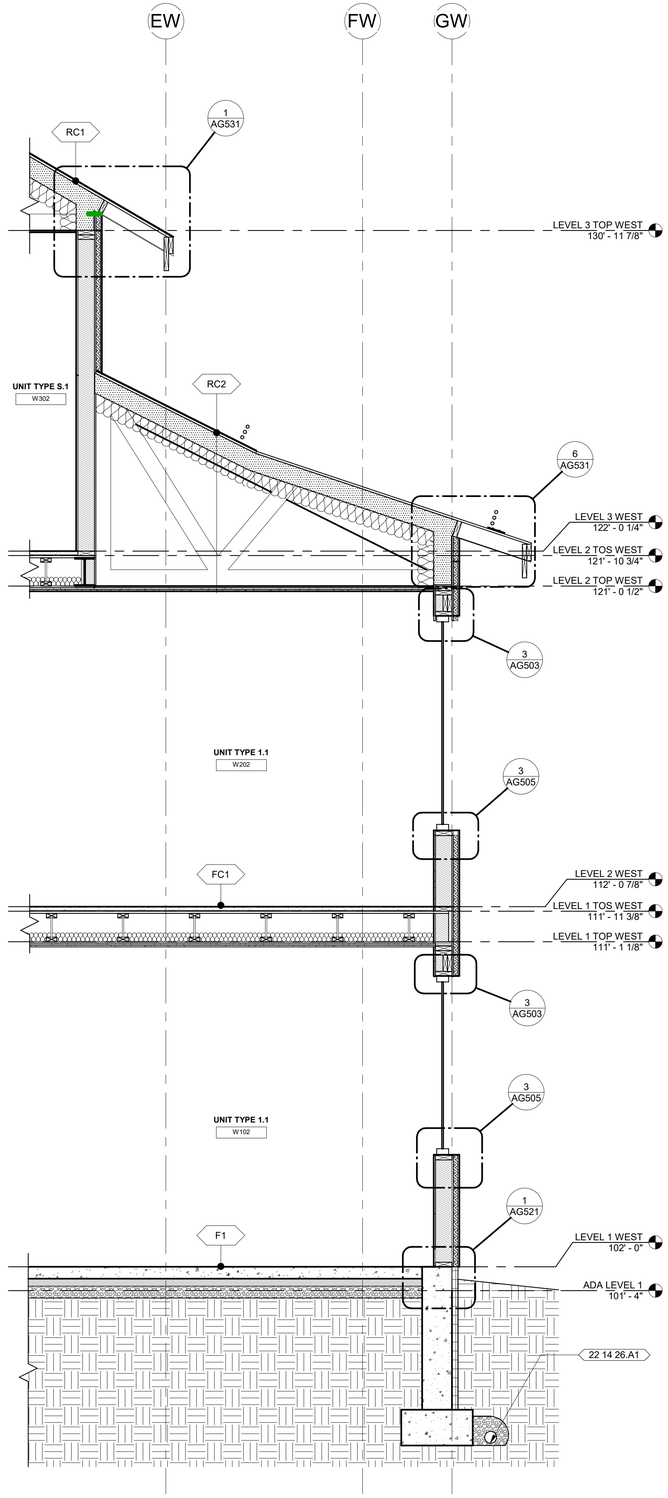
COPYRIGHT©

KEYNOTES

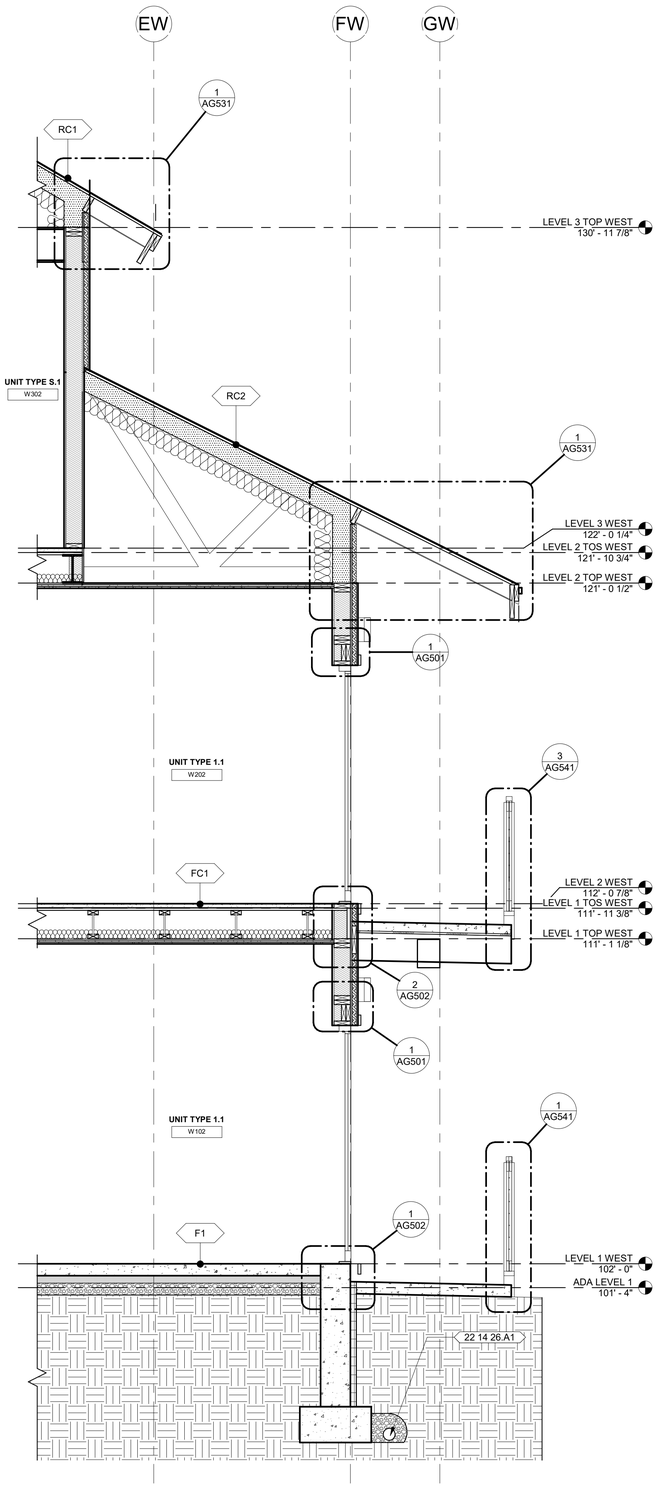
KEY VALUE	KEYNOTE TEXT
22 14 26.A1	STORM DRAIN, RE: CIVIL



3/ WALL SECTION 6 - WEST BUILDING
1/2" = 1'-0"



2/ WALL SECTION 5 - WEST BUILDING
1/2" = 1'-0"



1/ WALL SECTION 4 - WEST BUILDING
1/2" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

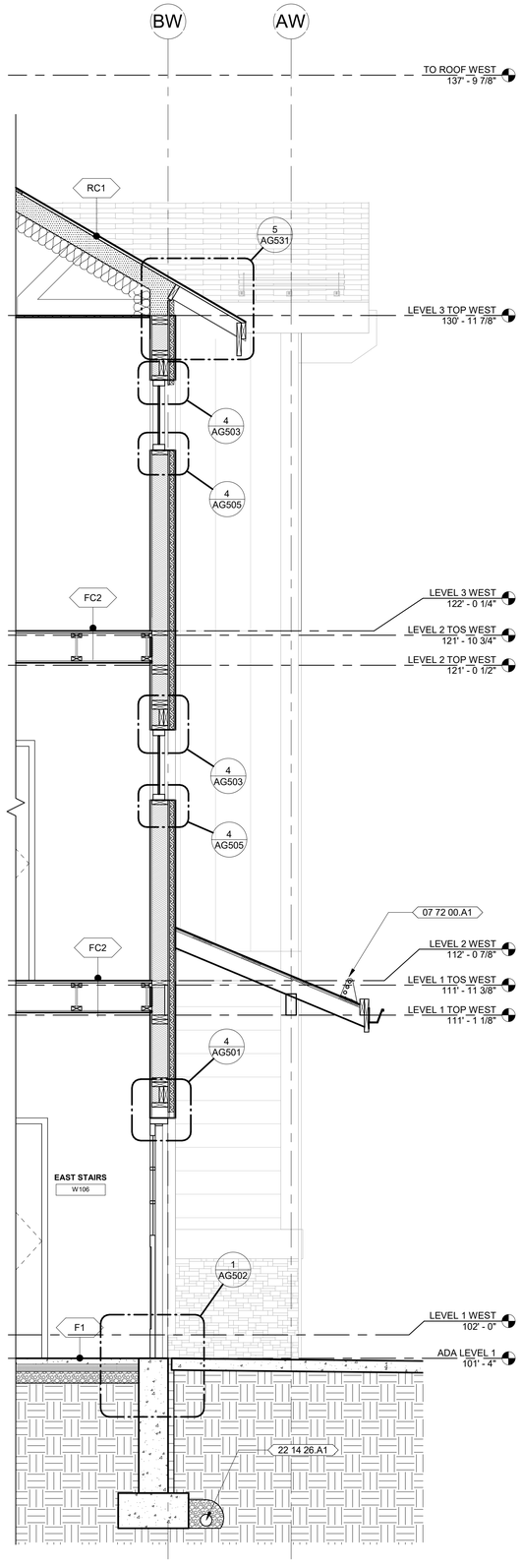
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

WALL SECTIONS - WEST BUILDING

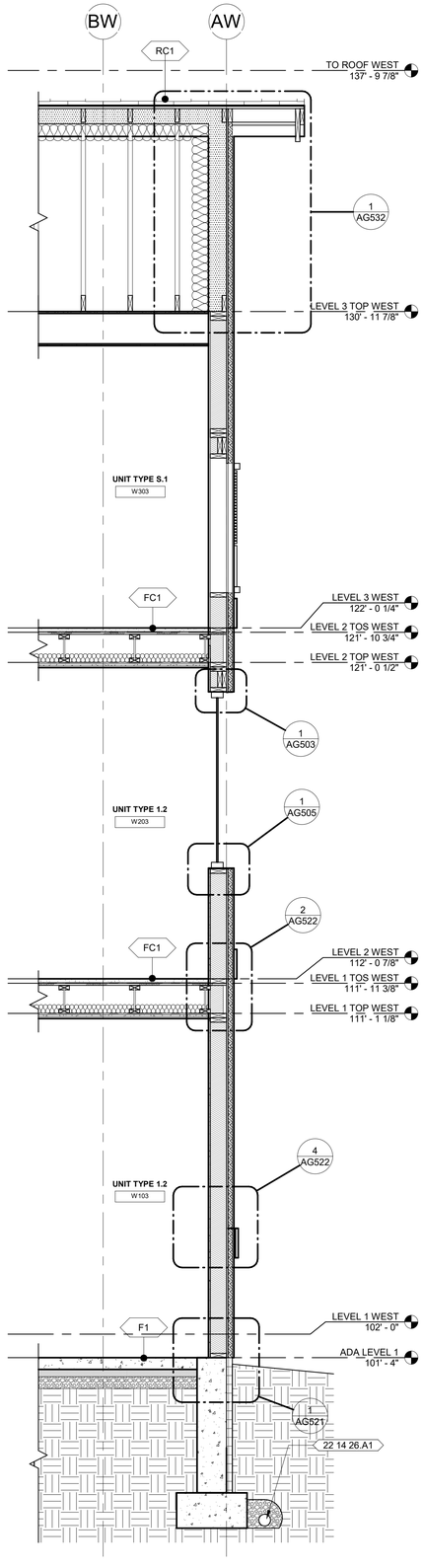
AW312

PLOT DATE: 3/28/2022 3:04:47 PM

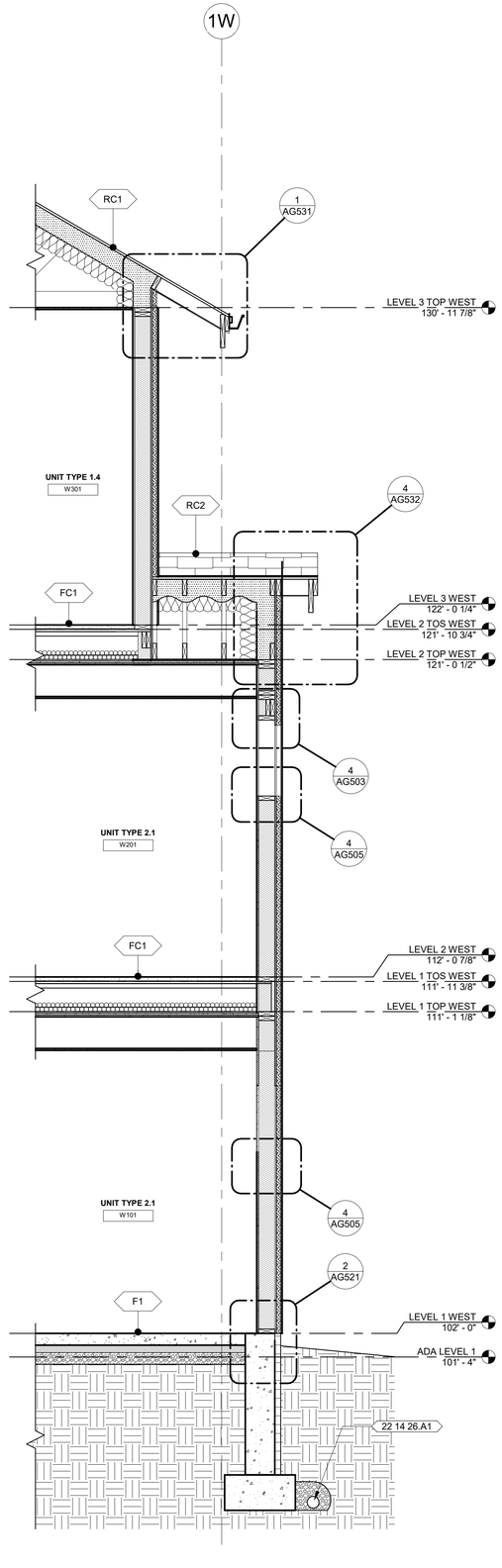
COPYRIGHT©



3 WALL SECTION 9 - WEST BUILDING
1/2" = 1'-0"



2 WALL SECTION 8 - WEST BUILDING
1/2" = 1'-0"



1 WALL SECTION 7 - WEST BUILDING
1/2" = 1'-0"

KEYNOTES

KEY VALUE	KEYNOTE TEXT
07 72 00.A1	POWDER COATED DECK-MOUNTED SNOW FENCE SYSTEM, DESIGNED BY OTHERS
22 14 26.A1	STORM DRAIN, RE: CIVIL

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

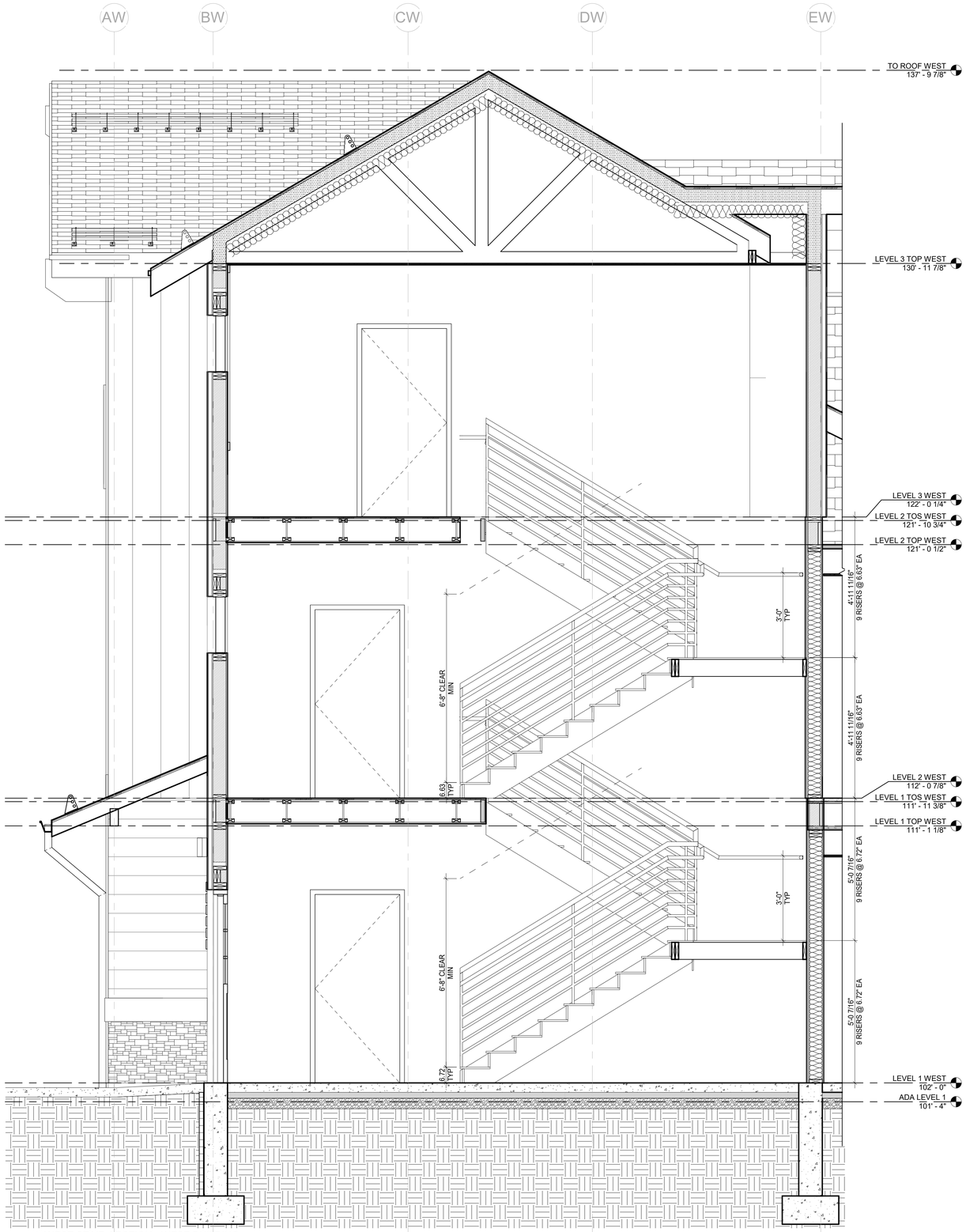
WALL SECTIONS - WEST BUILDING

AW313

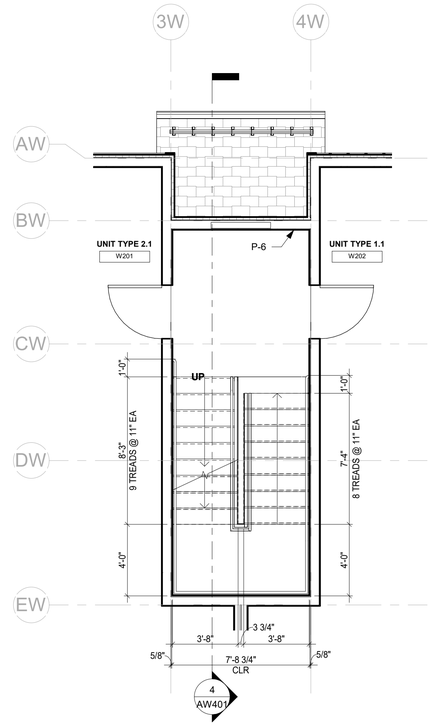
PLOT DATE: 3/28/2022 3:04:50 PM

COPYRIGHT©

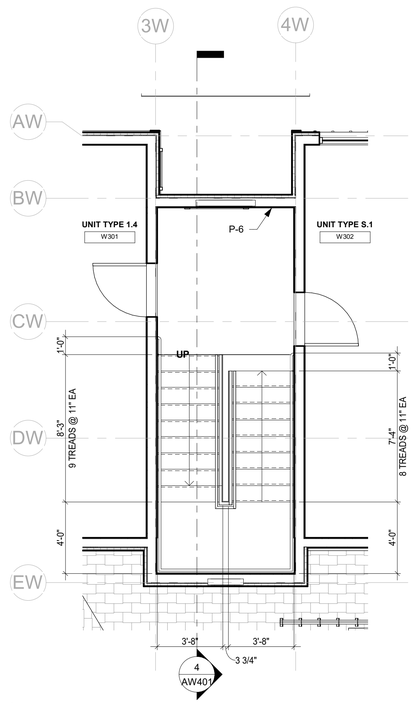
GENERAL NOTE: SEE FINISH SCHEDULE FOR FINISHES IN STAIRS, RE AG603.



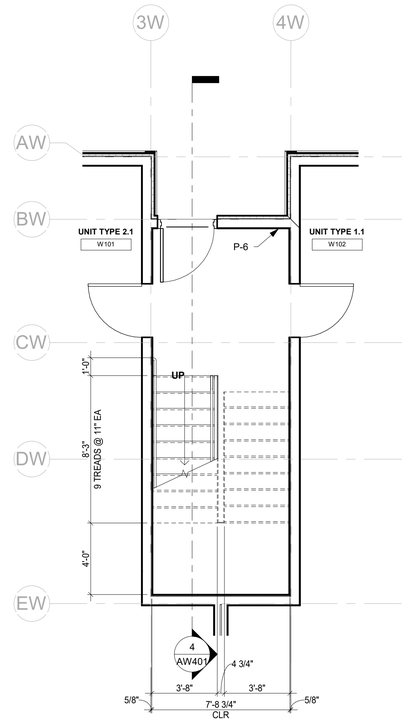
4/ WEST STAIR SECTION - WEST BUILDING
1/2" = 1'-0"



2/ LEVEL 2 WEST STAIR PLAN - WEST BUILDING
1/4" = 1'-0"



3/ LEVEL 3 WEST STAIR PLAN - WEST BUILDING
1/4" = 1'-0"



1/ LEVEL 1 WEST STAIR PLAN - WEST BUILDING
1/4" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

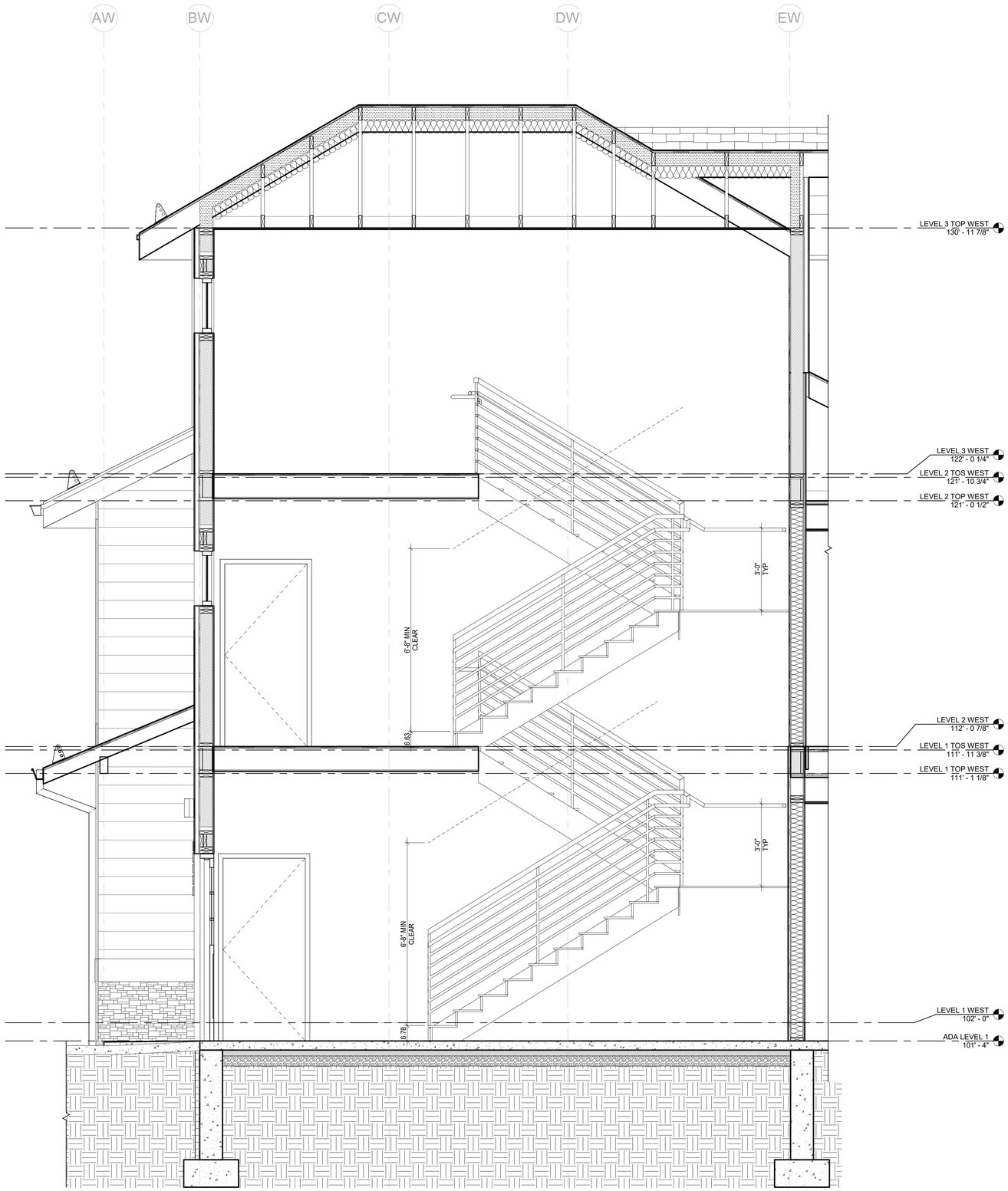
WEST STAIR - WEST BUILDING

AW401

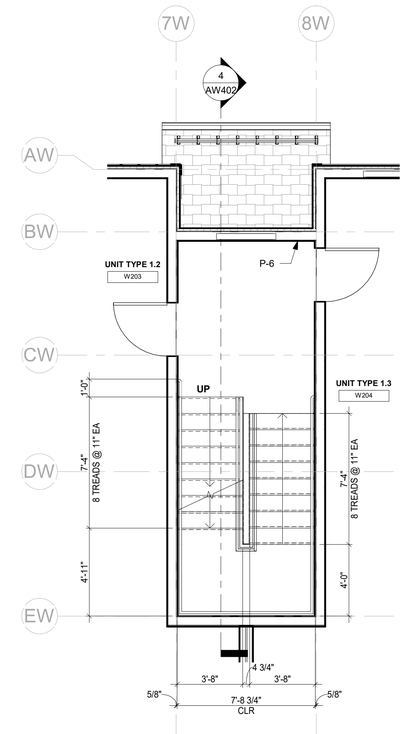
PLOT DATE: 3/28/2022 3:04:53 PM

COPYRIGHT©

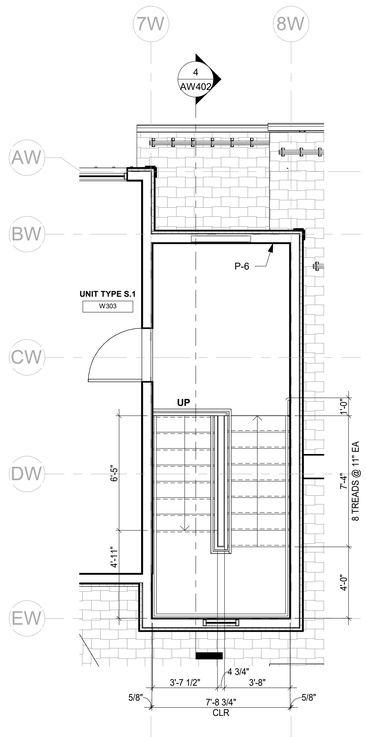
GENERAL NOTE: SEE FINISH SCHEDULE FOR FINISHES IN STAIRS, RE AG603.



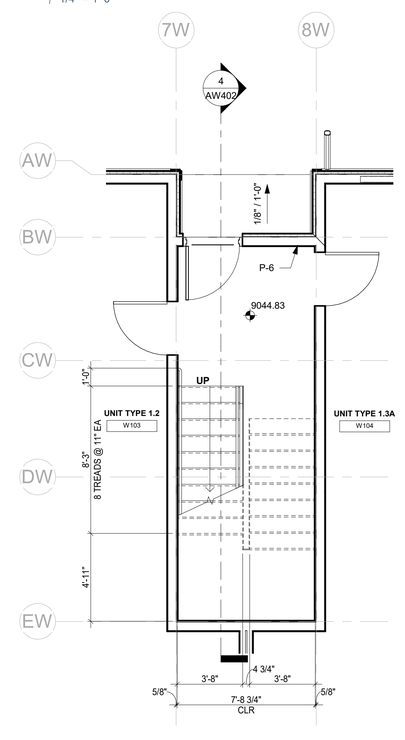
4 EAST STAIR SECTION - WEST BUILDING
1/2" = 1'-0"



2 LEVEL 2 EAST STAIR PLAN - WEST BUILDING
1/4" = 1'-0"



3 LEVEL 3 EAST STAIR PLAN - WEST BUILDING
1/4" = 1'-0"



1 LEVEL 1 EAST STAIR PLAN - WEST BUILDING
1/4" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

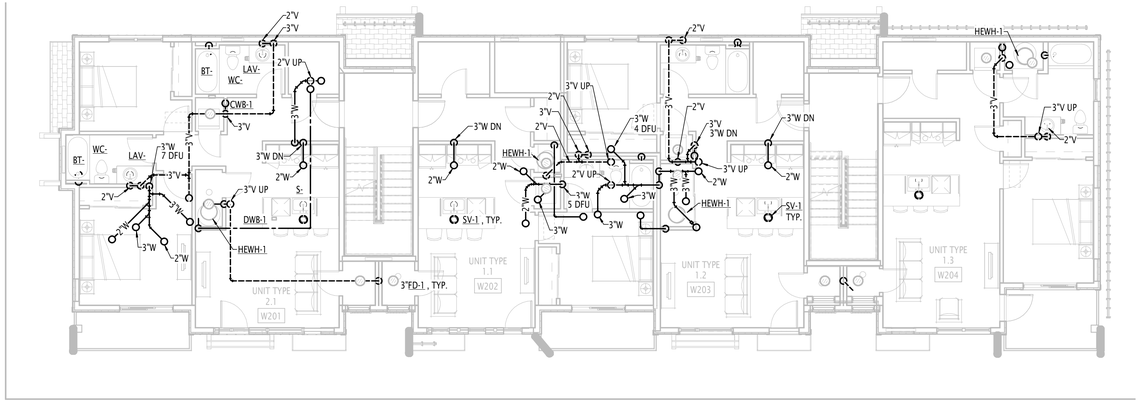
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

EAST STAIR - WEST BUILDING

AW402

PLOT DATE: 3/28/2022 3:04:55 PM

COPYRIGHT©

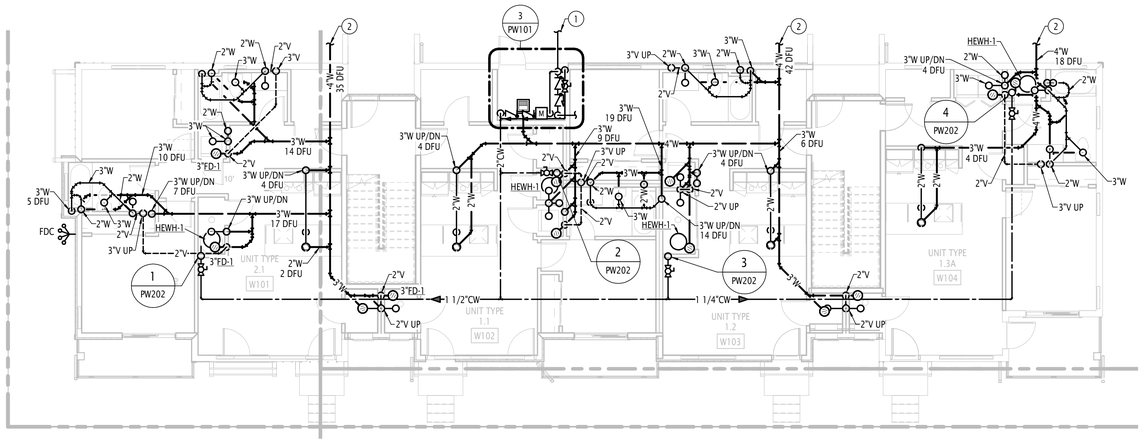


2 SECOND FLOOR PLUMBING PLAN WEST

SCALE: 1/8" = 1'-0"

0' 4' 8' 16' 32'

N



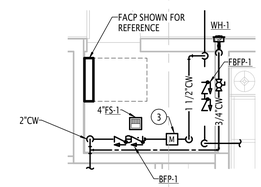
1 FIRST FLOOR PLUMBING PLAN WEST

SCALE: 1/8" = 1'-0"

0' 4' 8' 16' 32'

N

5



5

3 WEST ENLARGED WATER ENTRY PLUMBING PLAN

SCALE: 1/4" = 1'-0"

0' 4' 8' 16' 32'

X PLUMBING DETAIL NOTES

1. 4" COMBINATION FIRE/WATER SERVICE 5'-0" FROM BUILDING FACE. MINIMUM INVERT 5'-0" BELOW GRADE. REFER TO THE MOST RECENT CIVIL DWGS FOR THE FINAL LOCATION AND INVERT ELEVATION AND CONFIRM PRIOR TO ANY WORK. INFORMATION ON THE CIVIL DWGS TAKES PRECEDENCE.
2. 4" W DISCHARGE 5'-0" FROM BUILDING FACE. INVERT 40" MINIMUM BELOW BOTTOM OF SLAB . REFER TO THE MOST RECENT CIVIL DWGS FOR THE FINAL LOCATION AND INVERT ELEVATION AND CONFIRM PRIOR TO ANY WORK. INFORMATION ON THE CIVIL DWGS TAKES PRECEDENCE.
3. METER AND ACCESSORIES BY UTILITY.

GENERAL NOTES

1. ALL COLD AND HOT WATER PIPING FROM MANIFOLD TO BE 1/2".
2. COORDINATE EXACT CEILING PANEL ACCESS PANEL LOCATIONS WITH ARCHITECT PRIOR TO COMMENCING WORK.
3. PROVIDE FULL SIZE SHUT-OFF VALVE WITH SERVICE ACCESS FOR CONNECTION TO IMB-1 AT REFRIGERATOR.
4. PROVIDE FULL SIZE SHUT-OFF VALVE WITH SERVICE ACCESS FOR CONNECTION TO DISHWASHER. ROUTE DISHWASHER WASTE THROUGH APPROVED COUNTERTOP AIRGAP FITTING AND CONNECT TO DISPOSER/STANDPIPE.
5. SEE WATER HEATER DETAIL FOR WATER HEATER CLOSET FLOOR DRAIN DISCHARGE ROUTING. CLOSET DRAIN RISER TO AIRGAP TO FLOOR DRAIN IN BOTTOMMOST LEVEL CLOSET.
6. PROVIDE HWC PIPING AND PUMP IF FIXTURE RUNOUT EXCEEDS 43' ON 1/2" HW SUPPLY.

PLUMBING FIXTURE SCHEDULE - UNITS

FIXTURE	ALL UNITS EXCEPT ANSI	ANSI UNITS
BATHTUB/SHOWER	BT-1/SH-1	BT-1A/SH-1A
CLOTHES WASHER BOX	CWB-1	CWB-1
DISHWASHER BOX	DWB-1	DWB-1
LAVATORY	LAV-1	LAV-1A
KITCHEN SINK W/DISPOSAL	S-1	S-1
WATER CLOSET (FLUSH TANK)	WC-1	WC-1A

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, CO 80202
PH: 303.389.0095 | FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

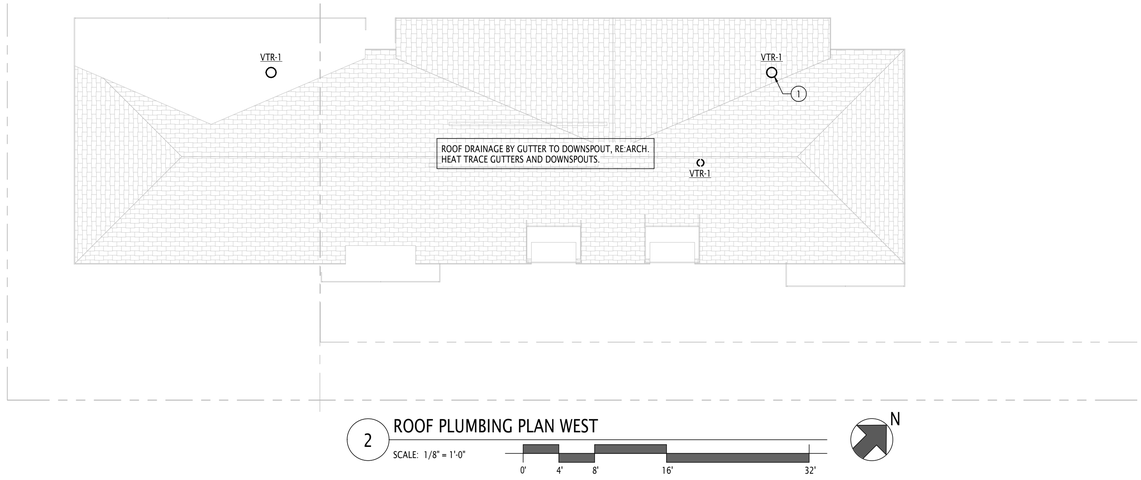
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

LEVELS 1 & 2
PLUMBING PLAN

PW101

PLOT DATE: 3/23/2022 8:03:27 AM

COPYRIGHT©



2 ROOF PLUMBING PLAN WEST

SCALE: 1/8" = 1'-0"

0' 4' 8' 16' 32'

N

1 THIRD FLOOR PLUMBING PLAN WEST

SCALE: 1/8" = 1'-0"

0' 4' 8' 16' 32'

N

X PLUMBING DETAIL NOTES

1 ROOF TERMINATIONS SHALL BE 12" MIN ABOVE ROOF, TYP.

GENERAL NOTES

1. ALL COLD AND HOT WATER PIPING FROM MANIFOLD TO BE 1/2".
2. COORDINATE EXACT CEILING PANEL ACCESS PANEL LOCATIONS WITH ARCHITECT PRIOR TO COMMENCING WORK.
3. PROVIDE FULL SIZE SHUT-OFF VALVE WITH SERVICE ACCESS FOR CONNECTION TO IMB-1 AT REFRIGERATOR.
4. PROVIDE FULL SIZE SHUT-OFF VALVE WITH SERVICE ACCESS FOR CONNECTION TO DISHWASHER. ROUTE DISHWASHER WASTE THROUGH APPROVED COUNTERTOP AIRGAP FITTING AND CONNECT TO DISPOSER/STANDPIPE.
5. SEE WATER HEATER DETAIL FOR WATER HEATER CLOSET FLOOR DRAIN DISCHARGE ROUTING. CLOSET DRAIN RISER TO AIRGAP TO FLOOR DRAIN IN BOTTOMMOST LEVEL CLOSET.
6. PROVIDE HWC PIPING AND PUMP IF FIXTURE RUNOUT EXCEEDS 43' ON 1/2" HW SUPPLY.

PLUMBING FIXTURE SCHEDULE - UNITS

FIXTURE	ALL UNITS EXCEPT ANSI	ANSI UNITS
BATHTUB/SHOWER	BT-1/SH-1	BT-1A/SH-1A
CLOTHES WASHER BOX	CWB-1	CWB-1
DISHWASHER BOX	DWB-1	DWB-1
LAVATORY	LAV-1	LAV-1A
KITCHEN SINK W/DISPOSAL	S-1	S-1
WATER CLOSET (FLUSH TANK)	WC-1	WC-1A

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, CO 80202
PH: 303.389.0095 | FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

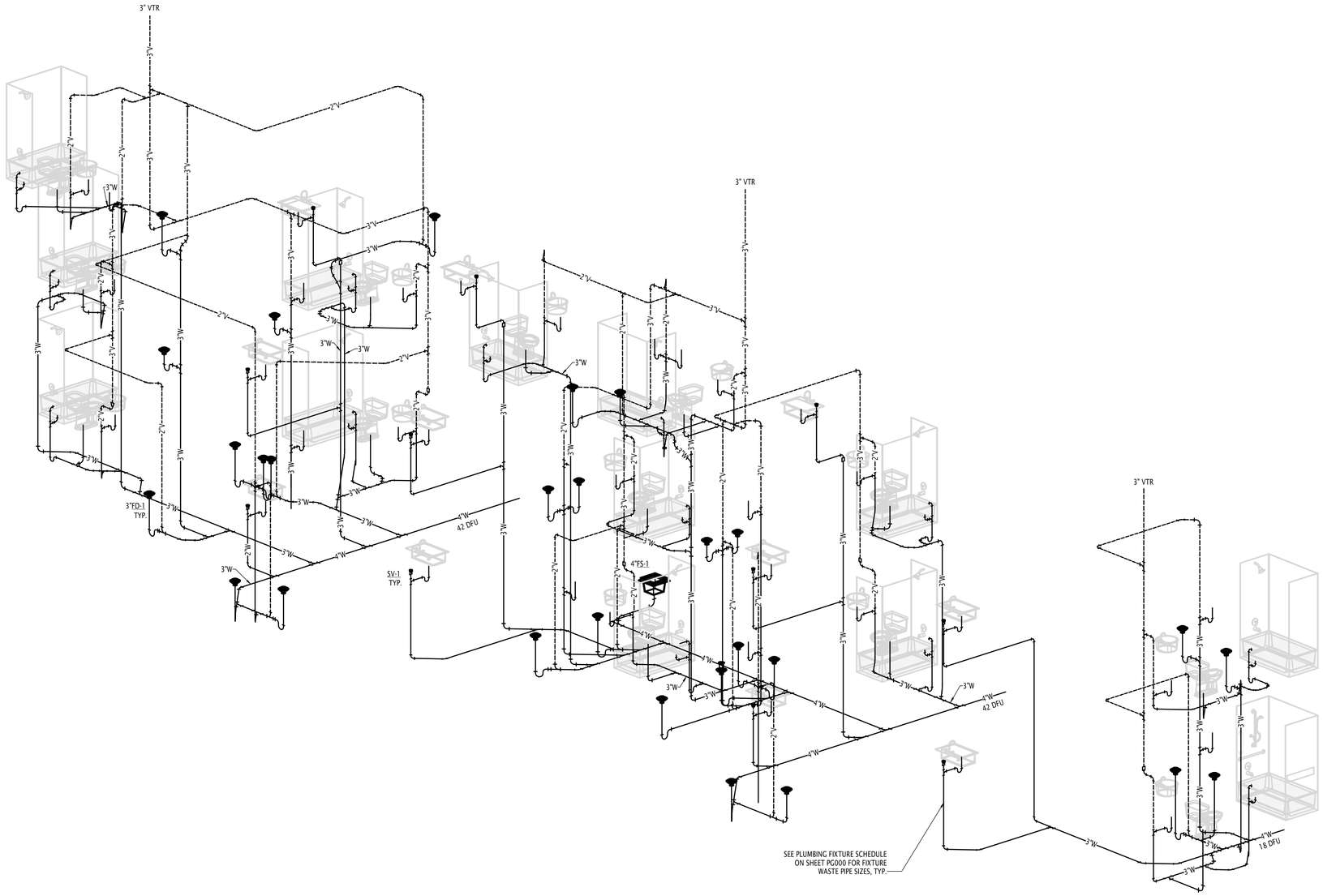
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

LEVELS 3 & ROOF PLUMBING PLAN

PW102

PLOT DATE: 3/23/2022 8:03:33 AM

COPYRIGHT©



1 WEST BLDG WASTE AND VENT ISOMETRIC

NO SCALE

PLOT DATE: 3/23/2022 8:03:37 AM

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, CO 80202
PH: 303.389.0095 | FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

Sheet Issue & Revision Log

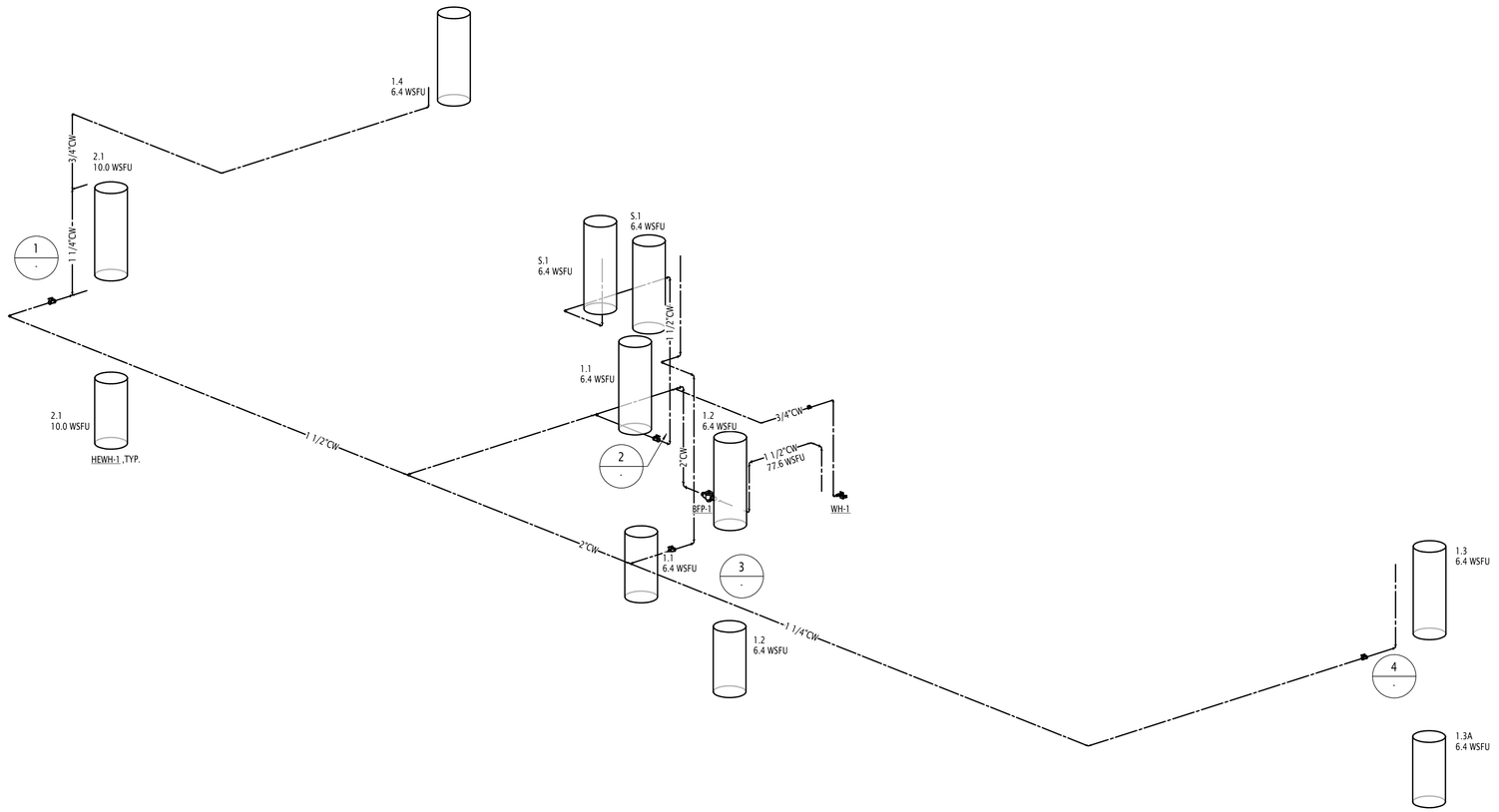
No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

WEST WASTE AND VENT ISOMETRIC

PW201

COPYRIGHT©



1 WEST BLDG DOMESTIC WATER ISOMETRIC

NO SCALE

PLOT DATE: 3/23/2022 8:03:39 AM

COPYRIGHT©

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, CO 80202
PH: 303.389.0095 | FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

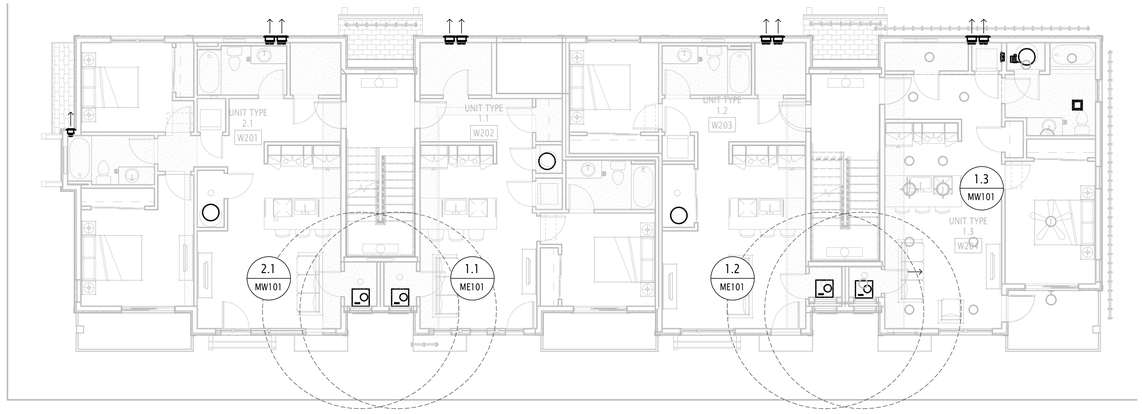
Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

WEST DOMESTIC WATER ISOMETRIC

PW202

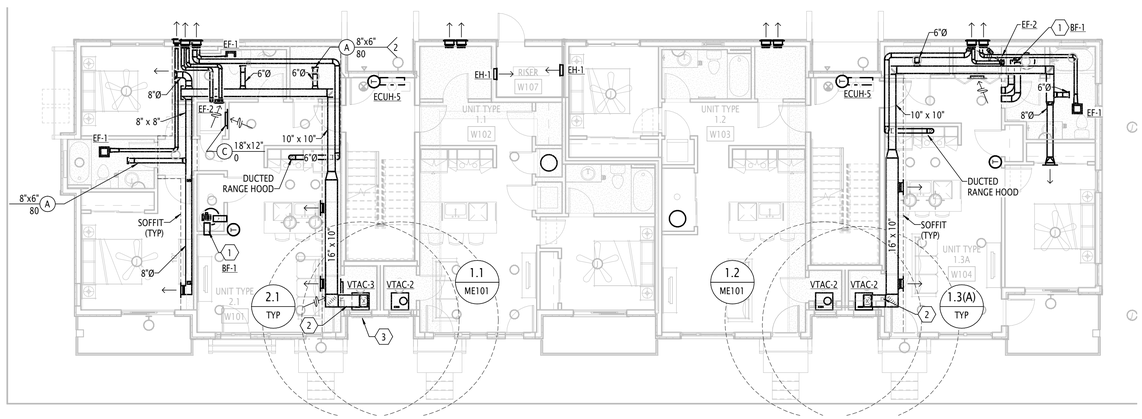


2 SECOND FLOOR MECHANICAL PLAN WEST

SCALE: 1/8" = 1'-0"

0' 4' 8' 16' 32'

N



1 FIRST FLOOR MECHANICAL PLAN WEST

SCALE: 1/8" = 1'-0"

0' 4' 8' 16' 32'

N

MECHANICAL DETAIL NOTES

X

1 PROVIDE BOOSTER FAN ACCESSORY FOR HYBRID WATER HEATER AND DUCT 8" INTAKE AND SUPPLY TO LIVING SPACE.

2 LOCKABLE DOOR WITH DOOR GRILLE, MIN. 3 SQFT. FREE AREA. (TYP)

3 REFER TO ARCHITECTURAL DRAWINGS FOR VTAC WALL LOUVER, TYP.

GENERAL NOTES

1. ALL SUPPLY DIFFUSERS IN RESIDENTIAL UNITS SHALL BE TYPE 'A' GRILLES UNLESS OTHERWISE NOTED. ROUTE ALL DUCTWORK IN SOFFIT BELOW RATED CEILING ASSEMBLY. PROVIDE HARD ELBOW FITTINGS TO PROVIDE A CLEAR UNOBSTRUCTED AIRFLOW PATH. EACH DIFFUSER SHALL PROVIDE 50-225 CFM AIRFLOW. UNDERCUT DOORS AT ALL BEDROOMS AND RESTROOMS 1" FOR RETURN AIR PATH.
2. PROVIDE TYPE 'B' RETURN GRILLE FOR EACH VTAC UNLESS NOTED OTHERWISE.
3. VENTILATION FOR RESIDENTIAL UNITS PROVIDED THROUGH VTAC OA INTAKE.
4. PROVIDE RADIATION DAMPER MEETING UL REQUIREMENTS AT EACH LOCATION PENETRATING THE CEILING PER 2018 IMC 607.6.2.
5. DRYER AND RESTROOM EXHAUST IS 4"Ø UNLESS OTHERWISE NOTED. PROVIDE FACTORY-MADE RECESSED DRYER BOX. USE DRYER-ELL 90° DRYER VENT ELBOWS FOR ALL 90° ANGLES. PROVIDE LABELING FOR DRYER EXHAUST LONGER THAN 35' TOTAL EQUIVALENT LENGTH PER IMC 504.8.5.
6. PROVIDE MINIMUM OF 100 SQUARE INCHES OF OPENING PER RESIDENTIAL DRYER IN ORDER TO PROVIDE MAKUP AIR PER 2018 IMC 607.6.2.
7. SEE DETAIL 1 & 2 OF SHEET MG003 FOR TERMINATION BOX. REFER TO ARCHITECTURAL FOR COLORS OF WALL TERMINATIONS.
8. VTAC THERMOSTATS SHALL BE REMOTE DIGITAL, 7 DAY PROGRAMMABLE TYPE.
9. PROVIDE INSECT SCREENS ON ALL INTAKE AND EXHAUST NOT USED FOR DRYER VENTS.

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, CO 80202
PH: 303.389.0095 | FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

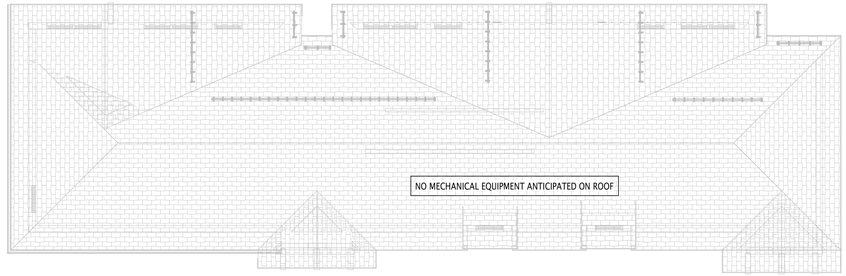
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

WEST LEVELS 1 & 2
HVAC PLAN

MW101

COPYRIGHT©

PLOT DATE: 3/23/2022 8:12:45 AM

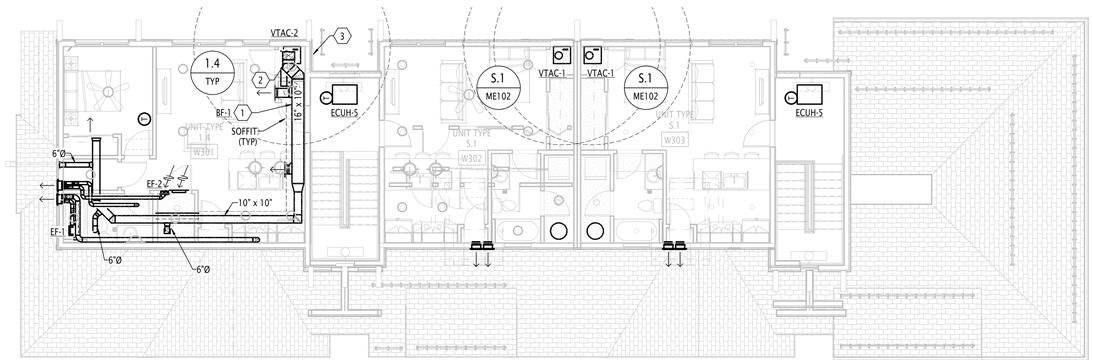


2 ROOF MECHANICAL PLAN WEST

SCALE: 1/8" = 1'-0"

0' 4' 8' 16' 32'

N



1 THIRD FLOOR MECHANICAL PLAN WEST

SCALE: 1/8" = 1'-0"

0' 4' 8' 16' 32'

N

X MECHANICAL DETAIL NOTES

1 PROVIDE BOOSTER FAN ACCESSORY FOR HYBRID WATER HEATER AND DUCT 8" INTAKE AND SUPPLY TO LIVING SPACE.

2 LOCKABLE DOOR WITH DOOR GRILLE, MIN. 3 SQFT. FREE AREA. (TYP)

3 REFER TO ARCHITECTURAL DRAWINGS FOR VTAC WALL LOUVER, TYP.

GENERAL NOTES

1. ALL SUPPLY DIFFUSERS IN RESIDENTIAL UNITS SHALL BE TYPE 'A' GRILLES UNLESS OTHERWISE NOTED. ROUTE ALL DUCTWORK IN SOFFIT BELOW RATED CEILING ASSEMBLY. PROVIDE HARD ELBOW FITTINGS TO PROVIDE A CLEAR UNOBSTRUCTED AIRFLOW PATH. EACH DIFFUSER SHALL PROVIDE 50-225 CFM AIRFLOW. UNDERCUT DOORS AT ALL BEDROOMS AND RESTROOMS 1" FOR RETURN AIR PATH.
2. PROVIDE TYPE 'B' RETURN GRILLE FOR EACH VTAC UNLESS NOTED OTHERWISE.
3. VENTILATION FOR RESIDENTIAL UNITS PROVIDED THROUGH VTAC OA INTAKE.
4. PROVIDE RADIATION DAMPER MEETING UL REQUIREMENTS AT EACH LOCATION PENETRATING THE CEILING PER 2018 IMC 607.6.2.
5. DRYER AND RESTROOM EXHAUST IS 4"Ø UNLESS OTHERWISE NOTED. PROVIDE FACTORY-MADE RECESSED DRYER BOX. USE DRYER-ELL 90° DRYER VENT ELBOWS FOR ALL 90° ANGLES. PROVIDE LABELING FOR DRYER EXHAUST LONGER THAN 35' TOTAL EQUIVALENT LENGTH PER IMC 504.8.5.
6. PROVIDE MINIMUM OF 100 SQUARE INCHES OF OPENING PER RESIDENTIAL DRYER IN ORDER TO PROVIDE MAKUP AIR PER 2018 IMC 607.6.2.
7. SEE DETAIL 1 & 2 OF SHEET MG003 FOR TERMINATION BOX. REFER TO ARCHITECTURAL FOR COLORS OF WALL TERMINATIONS.
8. VTAC THERMOSTATS SHALL BE REMOTE DIGITAL, 7 DAY PROGRAMMABLE TYPE.
9. PROVIDE INSECT SCREENS ON ALL INTAKE AND EXHAUST NOT USED FOR DRYER VENTS.

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, CO 80202
PH: 303.389.0095 | FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

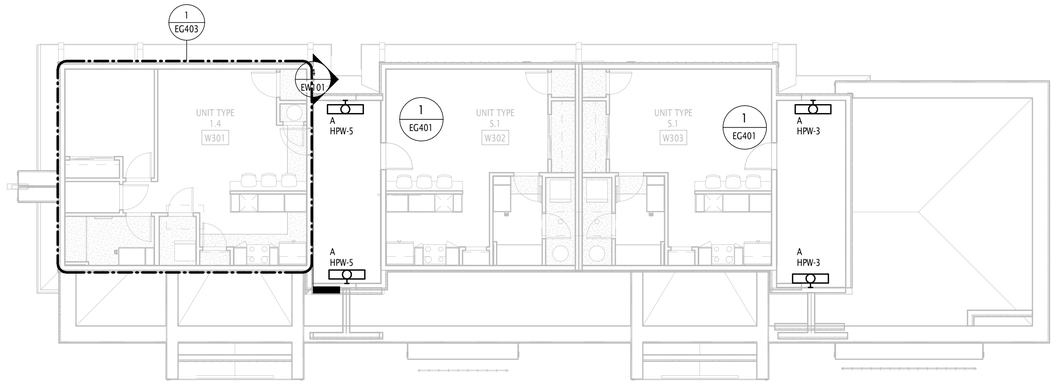
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

WEST LEVELS 3 & ROOF HVAC PLAN

MW102

PLOT DATE: 3/23/2022 8:12:53 AM

COPYRIGHT©

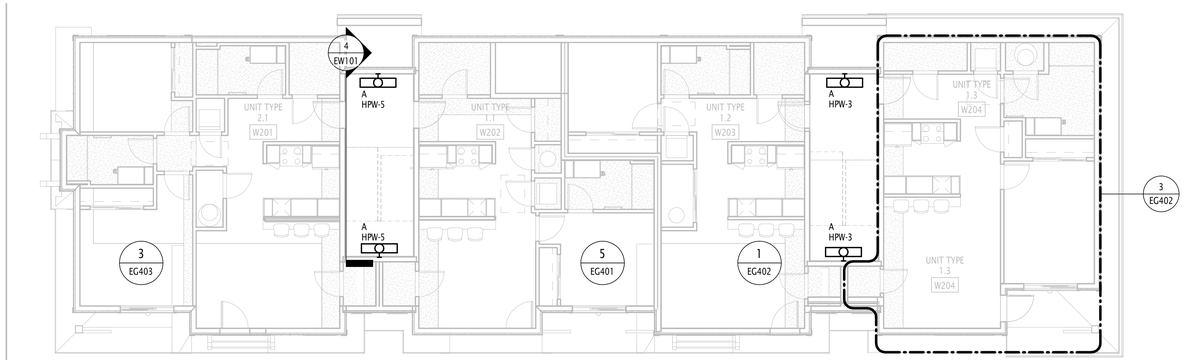


3 THIRD FLOOR LIGHTING PLAN WEST

SCALE: 1/8" = 1'-0"

0' 4' 8' 16' 32'

N



2 SECOND FLOOR LIGHTING PLAN WEST

SCALE: 1/8" = 1'-0"

0' 4' 8' 16' 32'

N

1 FIRST FLOOR LIGHTING PLAN WEST

SCALE: 1/8" = 1'-0"

0' 4' 8' 16' 32'

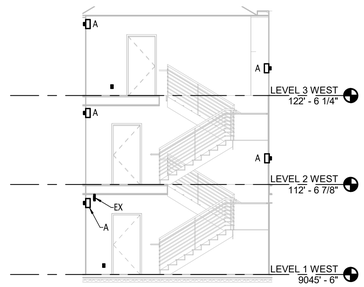
N

LIGHTING NOTES

1. THESE NOTES APPLAY TO ALL LIGHTING PLANS.
2. FURNISH AND INSTALL LIGHT FIXTURES COMPLETE WITH LAMPS, BALLAST(S), AND MOUNTING HARDWARE. ELECTRICAL CONTRACTOR SHALL SUBMIT FIXTURE CUT SHEETS TO CLIENT AND ARCHITECT FOR THEIR FINAL APPROVAL PRIOR TO ORDERING OF THE LUMINARIES. ELECTRICAL CONTRACTOR SHALL ALSO VERIFY QUANTITIES, MOUNTING REQUIREMENTS, FINISHES, FIXTURE AVAILABILITY AND LEAD TIME FOR DELIVERY TO SITE.
3. COORDINATE LAYOUT AND INSTALLATION OF LIGHTING FIXTURES AND SUSPENSION SYSTEM WITH OTHER CONSTRUCTION THAT PENETRATES CEILINGS OR IS SUPPORTED BY THEM, INCLUDING HVAC EQUIPMENT, FIRE-SUPPRESSION SYSTEM, AND PARTITION ASSEMBLIES. PRIOR TO COMMENCING OF WORK, NOTIFY ENGINEER OF ANY CONFLICTS BETWEEN HVAC EQUIPMENT AND LOCATION OF LIGHT FIXTURES. VERIFY CLEARANCES REQUIRED.
4. ALL LIGHTING FIXTURES SHALL BE POSITIVELY ATTACHED TO THE SUSPENDED CEILING SYSTEM BY MECHANICAL MEANS SUCH AS BOLTS, SCREWS, OR RIVETS. LISTED SUPPORT CLIPS, IDENTIFIED FOR USE WITH THE TYPE OF CEILING GRID MEMBER AND LUMINAIRE, ARE PERMITTED AT OR NEAR EACH FIXTURE CORNER. IN ADDITION, FIXTURES WEIGHING LESS THAN 50 POUNDS SHALL HAVE A MINIMUM OF TWO NO. 9 GAUGE WIRES CONNECTED FROM THE OPPOSITE CORNERS OF THE FIXTURE HOUSING TO THE STRUCTURE DIRECTLY ABOVE THE FIXTURE. FIXTURES ABOVE 50 POUNDS SHALL BE SUPPORTED DIRECTLY FROM THE STRUCTURE. FIXTURES OF SIZES LESS THAN CEILING GRID SHALL BE SUPPORTED INDEPENDENTLY WITH AT LEAST TWO 3/4-INCH METAL CHANNELS SPANNING AND SECURED TO CEILING TEES. DO NOT USE GRID AS SUPPORT FOR PENDANT FIXTURES; CONNECT SUPPORT WIRES OR RODS TO BUILDING STRUCTURE.
5. SUPPORT FLEXIBLE WIRING WHIPS FOR ALL FIXTURES INDEPENDENTLY OF THE GRID SUPPORT SYSTEM.
6. MULTIPLE LIGHT SWITCHES SHALL BE MOUNTED IN A MULTIPLE GANG BOX WITH SINGLE COVER PLATE.
7. EACH MULTIWIRE BRANCH CIRCUIT SHALL BE PROVIDED WITH A MEANS THAT WILL SIMULTANEOUSLY DISCONNECT ALL UNGROUNDED CONDUCTORS AT THE POINT WHERE THE BRANCH CIRCUIT ORIGINATES. DISCONNECTION CAN BE ACCOMPLISHED THROUGH IDENTIFIED HANDLE TIES USE WITH SINGLE-POLE CIRCUIT BREAKERS OR MULTI-POLE DEVICES. BRANCH CIRCUIT SERVING EMERGENCY LIGHTING CIRCUITS SHALL NOT BE PART OF A MULTIWIRE BRANCH CIRCUIT.
8. THE UNGROUNDED AND GROUNDED CONDUCTORS OF EACH MULTIWIRE BRANCH CIRCUIT SHALL BE GROUPED BY WIRE TIES OR SIMILAR MEANS IN AT LEAST ONE LOCATION WITHIN THE PANELBOARD OR OTHER POINT OF ORIGIN.
9. A GROUNDED (NEUTRAL) CIRCUIT CONDUCTOR OF THE LIGHTING CIRCUIT SHALL BE PROVIDED AT THE LIGHT SWITCH LOCATION.
10. ALL SWITCHES SHALL BE LABELED WITH DESIGNATED PANEL AND CIRCUIT NUMBER ON THE COVER PLATE.
11. LIGHT FIXTURES SHOWN SHADED, EMERGENCY LIGHT UNITS, AND EXIT SIGNS SHALL BE CONNECTED TO THE LIGHTING CIRCUIT SERVING THE NORMAL LIGHTING IN THE AREA AND CONNECTED AHEAD OF ANY LOCAL SWITCHES. ALL THESE FIXTURES SHALL BE EQUIPPED WITH BATTERY OF SUITABLE RATING AND CAPACITY TO SUPPLY AND MAINTAIN THE FIXTURE LOAD FOR A MINIMUM PERIOD OF 90 MINUTES.
12. LOCATIONS OF THE EXIT SIGNS SHALL BE COORDINATED WITH LOCAL AUTHORITIES. PROVIDE SIGNS IN ADDITIONAL LOCATIONS IF REQUESTED BY LOCAL AUTHORITIES.
13. MOUNT NEW WALL SWITCHES 48" ABOVE FINISHED FLOOR (A.F.F.).

X ELECTRICAL DETAIL NOTES

1 EXTERIOR LIGHT FIXTURES TO BE CONTROLLED VIA ASTRONOMICAL TIME SWITCH. REFER TO SHEET EG101, ELECTRICAL SITE PLAN, FOR SITE LIGHTING LAYOUT, CIRCUIT INFORMATION AND BUILDING CONTROL DESIGNATION.



4 TYPICAL WEST BUILDING STAIRWELL ELEVATION

NO SCALE

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, CO 80202
PH: 303.389.0095 | FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

0" 1" THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

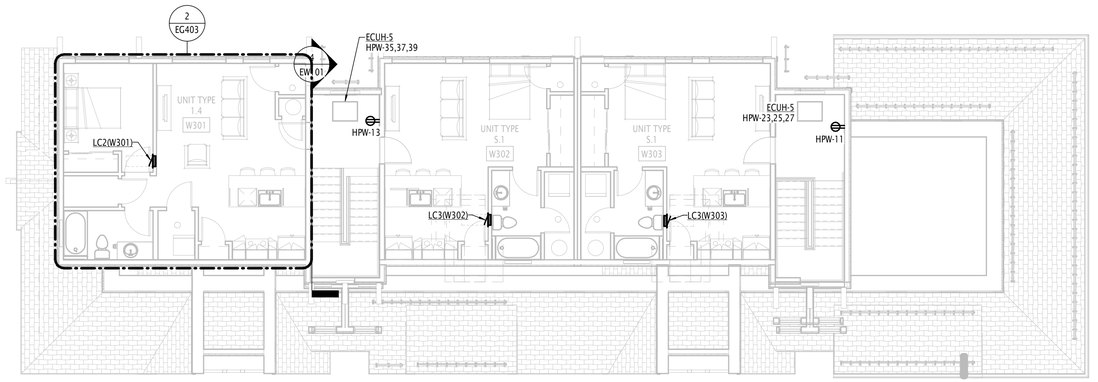
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

WEST LIGHTING PLANS

EW101

PLOT DATE: 3/23/2022 8:20:59 AM

COPYRIGHT©

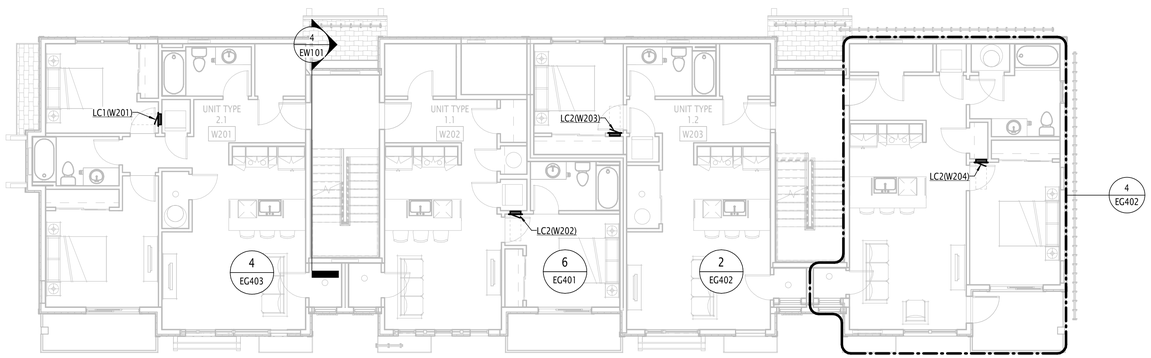


3 THIRD FLOOR POWER PLAN WEST

SCALE: 1/8" = 1'-0"

0' 4' 8' 16' 32'

N

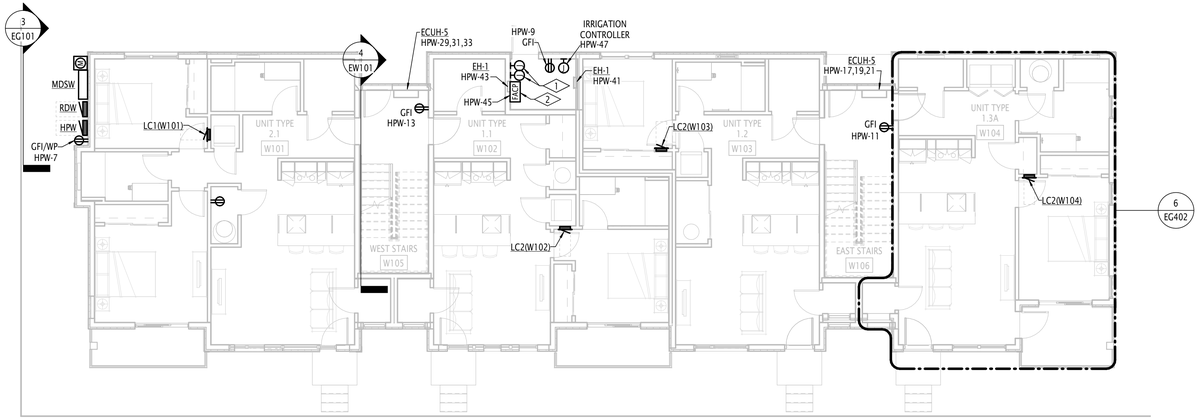


2 SECOND FLOOR POWER PLAN WEST

SCALE: 1/8" = 1'-0"

0' 4' 8' 16' 32'

N



1 FIRST FLOOR POWER PLAN WEST

SCALE: 1/8" = 1'-0"

0' 4' 8' 16' 32'

N

POWER NOTES

1. THESE NOTES APPLAY TO ALL POWER PLANS.
2. NEW WALL MOUNTED POWER, DATA AND COMMUNICATIONS OUTLETS SHALL BE MOUNTED 18" A.F.F. (FROM FLOOR TO CENTERLINE OF THE BOX, U.N.O.) IN ORDER TO COMPLY WITH ADA REQUIREMENTS.
3. CONTRACTOR SHALL COORDINATE EXACT OUTLET AND DEVICE LOCATIONS WITH OWNER/CLIENT/ARCHITECT OR EQUIPMENT SUBCONTRACTOR.
4. RECEPTACLE OUTLETS AND SWITCHES SHALL BE LABELED WITH DESIGNATED PANEL AND CIRCUIT NUMBER ON OR INSIDE THE COVER PLATE. JUNCTION BOXES AND DISCONNECTS SHALL HAVE CIRCUIT NUMBERS MARKED ON THE COVER..
5. 125-VOLT, SINGLE PHASE, 15- AND 20-AMPERE RECEPTACLES INSTALLED IN BATHROOMS, KITCHEN/FOOD PREPARATION AREAS, OUTDOOR, WITHIN SIX FEET OF THE OUTSIDE EDGE OF THE SINK, OR IN GARAGES, SERVICE BAYS, AND SIMILAR AREAS WHERE ELECTRICAL HAND TOOLS OR PORTABLE LIGHTING EQUIPMENT ARE TO BE USED SHALL HAVE GROUND-FAULT CIRCUIT-INTERRUPTER PROTECTION FOR PERSONNEL PER NATIONAL ELECTRICAL CODE (NEC) ARTICLE 210.8. THE GROUND-FAULT CIRCUIT INTERRUPTER SHALL BE INSTALLED IN A READILY ACCESSIBLE LOCATION.
6. WHEN RECEPTACLE IS MARKED AS "GFI", GFCI PROTECTION NEEDS TO BE PROVIDED. PROVIDE GFCI-TYPE CIRCUIT BREAKER OR RECEPTACLE. WHEN MULTIPLE RECEPTACLES ARE SHOWN AS "GFI" AND CONNECTED TO THE SAME CIRCUIT NOT PROTECTED BY GFCI-TYPE CIRCUIT BREAKER, FIRST RECEPTACLE IN THE BRANCH CIRCUIT NEEDS TO BE GFCI-TYPE WITH ALL OTHER RECEPTACLES CONNECTED TO THE LOAD SIDE OF THIS RECEPTACLE.
7. EACH MULTIWIRE BRANCH CIRCUIT SHALL BE PROVIDED WITH A MEANS THAT WILL SIMULTANEOUSLY DISCONNECT ALL UNGROUNDED CONDUCTORS AT THE POINT WHERE THE BRANCH CIRCUIT ORIGINATES. DISCONNECTION CAN BE ACCOMPLISHED THROUGH IDENTIFIED HANDLE TIES USE WITH SINGLE-POLE CIRCUIT BREAKERS OR MULTI-POLE DEVICES. THE BRANCH CIRCUIT SERVING EMERGENCY POWER CIRCUITS SHALL NOT BE PART OF A MULTIWIRE BRANCH CIRCUIT.
8. THE UNGROUNDED AND GROUNDED CONDUCTORS OF EACH MULTIWIRE BRANCH CIRCUIT SHALL BE GROUPED BY WIRE TIES OR SIMILAR MEANS IN AT LEAST ONE LOCATION WITHIN THE PANELBOARD OR OTHER POINT OF ORIGIN.
9. OUTLET BOXES, INSTALLED ON EDGES OF METAL STUDS, ARE REQUIRED TO BE SECURED IN PLACE BY THE ADDITIONAL USE OF BOX-BACK SUPPORTS PER NEC ARTICLE 314.23.
10. PRIOR TO ANY REQUIRED CORE-DRILLING OF CONCRETE FLOOR OR WALLS, CONTRACTOR SHALL X-RAY. COORDINATE SCHEDULE WITH GENERAL CONTRACTOR.
11. DATA AND TELECOMMUNICATIONS CABLING SHALL BE INSTALLED BY CLIENT'S VENDOR. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING REQUIRED JUNCTION BOXES AND RACEWAYS ROUGH-INS WITH APPROPRIATE VENDOR.
12. PROVIDE INDIVIDUAL 1" EMT CONDUIT FROM EACH PHONE/DATA OUTLET, CONSISTING MULTIPLE CONNECTORS AND REQUIRING MULTIPLE CABLES TO BE INSTALLED, STUBBED MINIMUM 3" INTO ACCESSIBLE CEILING SPACE. INSTALL INSULATION BUSHING AND PROVIDE PULL WIRE. COORDINATE REQUIREMENTS WITH TELECOMMUNICATIONS CONTRACTOR.
13. FROM EACH NEW SINGLE PHONE, COMMUNICATIONS OR COAXIAL CABLE OUTLET, CONSISTING OF A SINGLE CONNECTOR AND REQUIRING A SINGLE CABLE TO BE INSTALLED, PROVIDE 3/4" CONDUIT STUBBED MINIMUM 3" INTO ACCESSIBLE CEILING SPACE AND BUSHED. PROVIDE PULL WIRE. COORDINATE REQUIREMENTS WITH TELECOMMUNICATIONS CONTRACTOR.
14. BACK-TO-BACK OUTLETS IN THE SAME WALL AND THRU-WALL TYPE BOXES NOT PERMITTED. PROVIDE NIPPLE (LENGTH AS REQUIRED) TO OFFSET FOR ALL OUTLETS SHOWN ON OPPOSITE SIDES OF A COMMON WALL TO MINIMIZE SOUND TRANSMISSION.
15. PROTRUSIONS PROHIBITED IN DEDICATED ELECTRICAL SPACE IN FRONT OF ALL ELECTRICAL EQUIPMENT REQUIRING SERVICING WHILE ENERGIZED. THIS INCLUDES CONTROL PANELS AND ELECTRICAL DISCONNECTS AT OR INSIDE ROOFTOP HVAC UNITS, CONDENSING UNITS AND AIR CONDITIONING UNITS LOCATED ABOVE CEILINGS AND AT GRADE LEVEL. PENETRATIONS SUCH AS ROOF JACKS FOR ELECTRICAL POWER, LOW VOLTAGE CONTROL POWER, REFRIGERANT LINES, VENT PIPES, ETC., AND INCLUDING GAS LINES, DUCTWORK, ROOF DRAINS, SCREENING WALLS AND OTHER EQUIPMENT OF ANY TYPE, IS NOT TO PROTRUDE INTO THIS SPACE. MINIMUM SPACE IN FRONT OF ELECTRIC EQUIPMENT SHALL BE THE WIDTH OF THE EQUIPMENT OR 30 INCHES, WHICHEVER IS GREATER, AND 36 INCHES EXTENDING OUT FROM ENCLOSURE FRONT TO A FLAT LEVEL ROOF, GRADE, FLOOR, OR PLATFORM TO THE HEIGHT OF 6.5 FEET.
16. FOR HEATING, AIR-CONDITIONING, AND REFRIGERATION EQUIPMENT SHALL BE PROVIDED A 125-VOLT, 15- OR 20-AMPERE RATED RECEPTACLE OUTLET, INSTALLED AT AN ACCESSIBLE LOCATION FOR THE SERVICING OF HEATING, AIR-CONDITIONING, AND REFRIGERATION EQUIPMENT. THE RECEPTACLE SHALL BE LOCATED ON THE SAME LEVEL AND WITHIN 25 FEET OF THE EQUIPMENT, AND NOT BE CONNECTED TO THE LOAD SIDE OF THE EQUIPMENT DISCONNECT MEANS. THE RECEPTACLE OUTLET SHALL BE WEATHERPROOF, GFI PROTECTED IF INSTALLED OUTDOOR OR IN THE WET LOCATION.
17. AN INDIVIDUAL DISCONNECTING MEANS SHALL BE PROVIDED IN SIGHT FROM THE LOCATION FOR EACH MOTOR OR THE DRIVEN MACHINERY IN ACCORDANCE WITH NEC ARTICLE 430.
18. MECHANICAL CONTRACTOR SHALL FURNISH STARTERS FOR ALL THREE-PHASE MECHANICAL EQUIPMENT (EXCEPT FOR STARTERS THAT ARE SHOWN TO BE PROVIDED IN MOTOR CONTROL CENTERS). STARTERS SHALL HAVE OVERLOAD PROTECTION, WITH MANUAL RESET, AND SHALL BE NEMA RATED. STARTERS SHALL BE INSTALLED BY ELECTRICAL CONTRACTOR EXCEPT WHERE SUPPLIED AS INTEGRAL PART OF THE MECHANICAL EQUIPMENT. ELECTRICAL CONTRACTOR SHALL PROVIDE SAFETY DISCONNECT SWITCHES FOR ALL MECHANICAL EQUIPMENT WHERE NOT SPECIFICALLY INDICATED ON MECHANICAL PLANS TO BE PROVIDED BY MECHANICAL CONTRACTOR.
19. IF RACEWAYS ARE INSTALLED EXPOSED TO DIRECT SUNLIGHT ON OR ABOVE ROOFTOPS CORRECTIONS NEED TO BE PROVIDED FOR CONDUCTOR SIZES BASED ON TEMPERATURE ADJUSTMENTS. THE ADJUSTMENTS SHOWN IN NEC TABLE 310.15(B)(3)(c) SHALL BE ADDED TO THE OUTDOOR TEMPERATURE TO DETERMINE THE APPLICABLE AMBIENT TEMPERATURE FOR APPLICATION OF THE CORRECTION FACTORS IN TABLE 310.15(B)(2)(a) OR TABLE 310.15(B)(2)(b).
20. THE BUILDING HAS AREAS OF WOOD CONSTRUCTION TYPE III-A OR V-A. THE ENGINEER ASSUMES THAT THE ELECTRICAL CONTRACTOR WILL BE USING NONMETALLIC-SHEATHED CABLE TYPES NM AND SERVICE ENTRANCE CABLE TYPE SE OR EQUAL FOR THE ELECTRICAL INSTALLATION IN THESE AREAS. ANY ELECTRICAL PANELS SHOWN IN THESE AREAS NEED TO BE RECESSED IN A MINIMUM OF 6-INCH WALL OR BE SURFACE-MOUNTED AND THE WALL TO BE FURRED ABOVE AND BELOW THE PANEL TO CONCEAL THE CABLES AS REQUIRED PER NEC ARTICLES 334.10 AND 338.10. ELECTRICAL CONTRACTOR TO COORDINATE INSTALLATION AND ADDITIONAL WORK REQUIRED WITH THE ARCHITECT AND GENERAL CONTRACTOR.

X ELECTRICAL DETAIL NOTES

1 ELECTRICAL CONTRACTOR TO PROVIDE JUNCTION BOX, CONDUIT AND PULL STRING FROM RESIDENTIAL DISTRIBUTION PANEL, RDW, TO APPROXIMATE LOCATION SHOWN FOR CONNECTION TO DATA COLLECTION UNIT, DCU. PROVIDE 120V CIRCUIT (PANEL HPW, CIRCUIT #15). COORDINATE EXACT LOCATION PER MANUFACTURER SPECIFICATIONS AND WITH MECHANICAL AND PLUMBING CONTRACTORS PRIOR TO PERFORMING ANY WORK. COORDINATE ANY ADDITIONAL INSTALLATION REQUIREMENTS WITH MANUFACTURER SPECIFICATIONS PRIOR TO PERFORMING ANY WORK.

2 COORDINATE EXACT LOCATION OF FIRE ALARM CONTROL PANEL WITH ARCHITECT PRIOR TO ROUGH-IN.

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, COLORADO 80202
PH: 303.389.0095 | FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

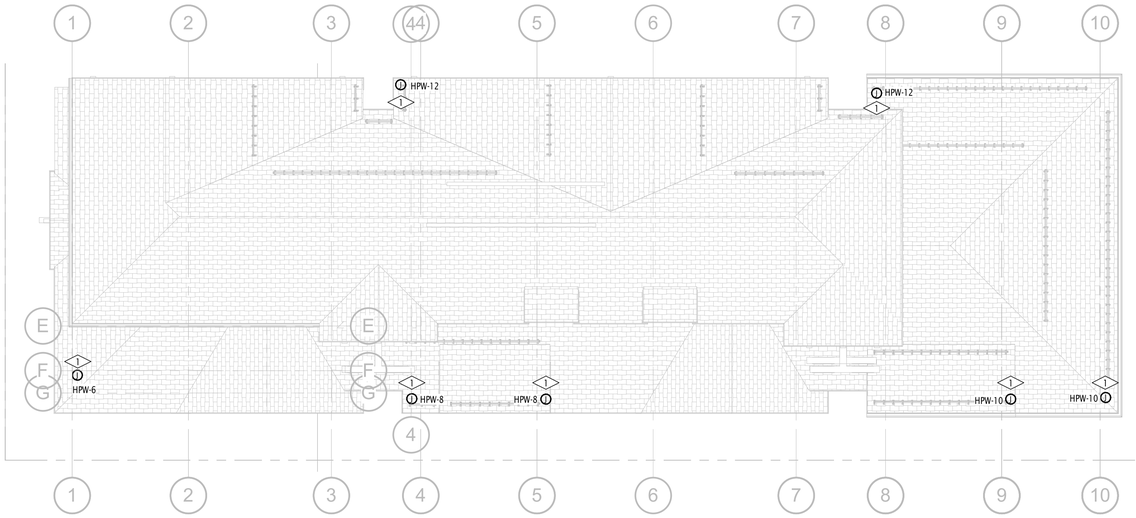
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

WEST POWER PLANS

EW102

PLOT DATE: 3/23/2022 8:21:08 AM

COPYRIGHT©



1 ROOF POWER PLAN WEST

SCALE: 1/8" = 1'-0"

0' 4' 8' 16' 32'

N

X ELECTRICAL DETAIL NOTES

1 RECOMMENDED LOCATION FOR LINEAR SNOWMELT TAPE JUNCTION BOX AND CONNECTION. EXACT ELECTRICAL SPECIFICATION OF LINEAR SNOWMELT TAPE AND ASSOCIATED EQUIPMENT UNKNOWN AT TIME OF DESIGN; 375VA, 120V, 1-PHASE, HARDWIRED CONNECTION ASSUMED. PROVIDE (2-10 & 1-10GND) CONDUCTORS TO COMPENSATE FOR VOLTAGE DROP. COORDINATE EXACT ELECTRICAL SPECIFICATIONS, LINEAR SNOW MELT TAPE LOCATION, CONTROL PANEL LOCATION (IF REQUIRED) AND ANY ADDITIONAL INSTALLATION REQUIREMENTS WITH OWNER'S SNOWMELT VENDOR AND MANUFACTURER SPECIFICATIONS PRIOR TO PERFORMING ANY WORK.

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, CO 80202
Ph: 303.389.0095 | FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

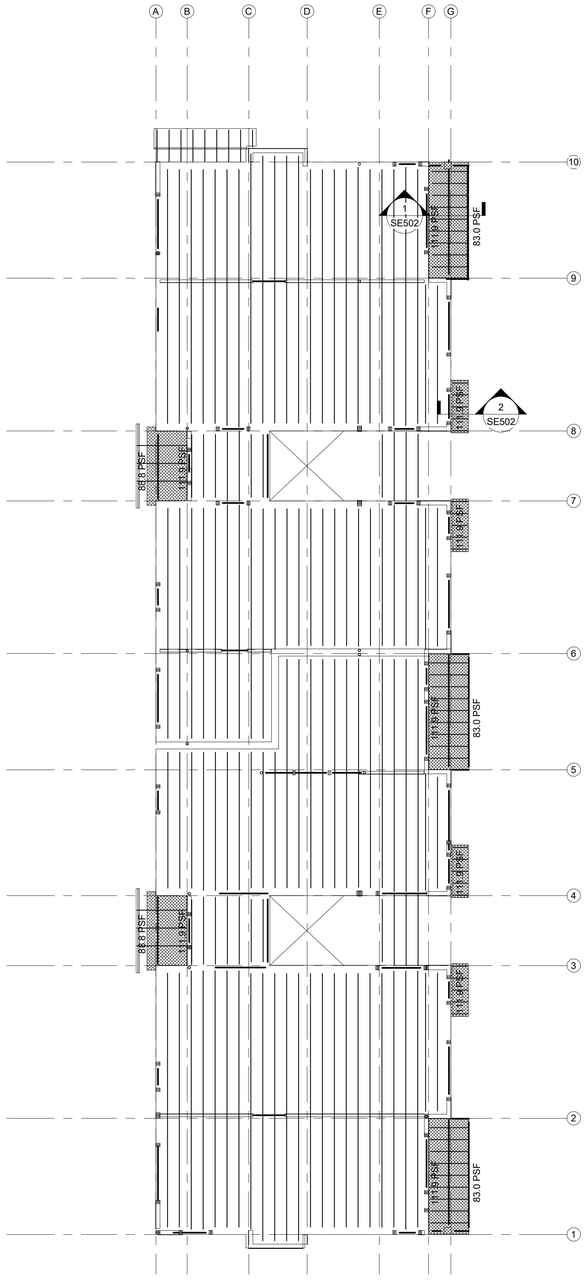
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

WEST ROOF POWER PLAN

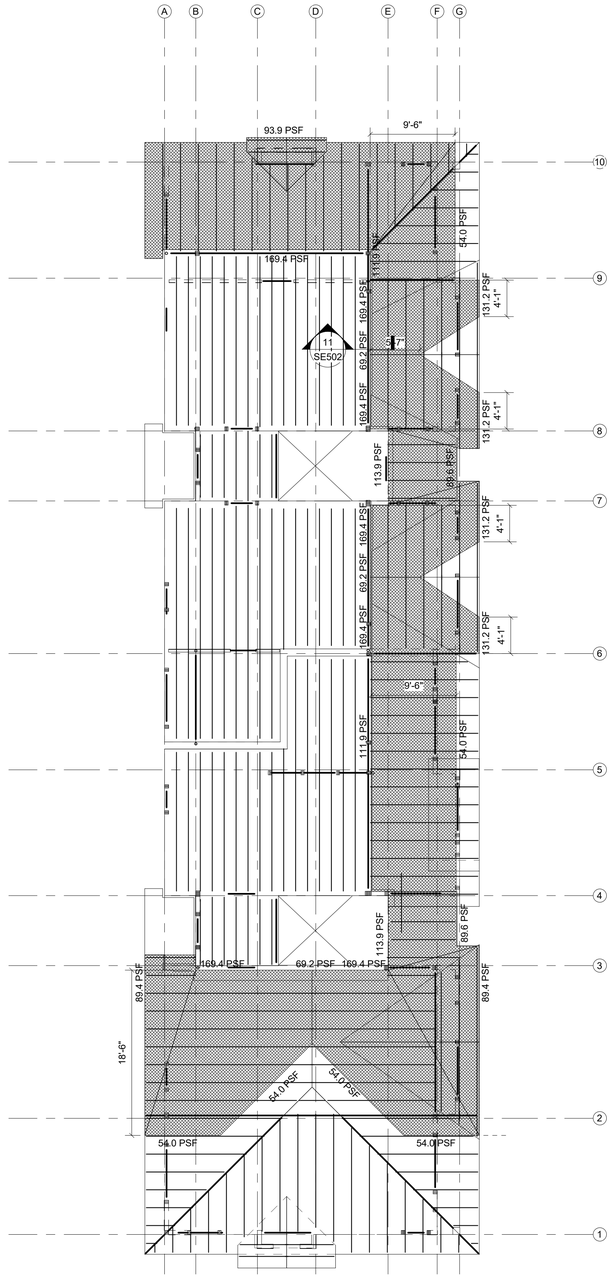
EW103

PLOT DATE: 3/23/2022 8:21:11 AM

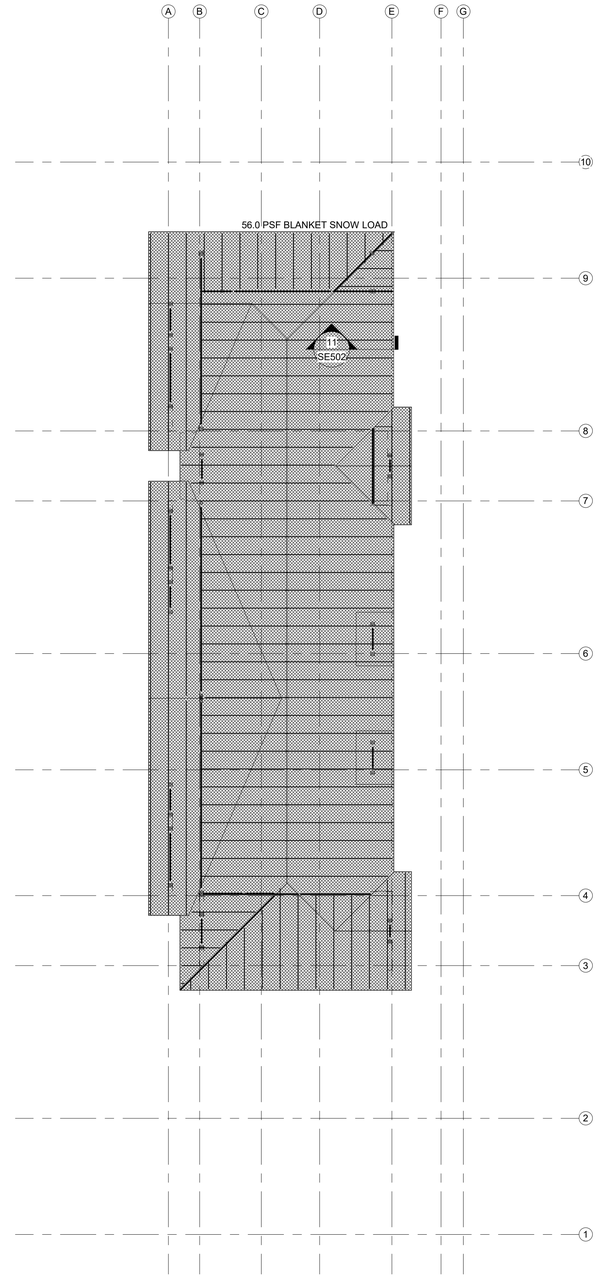
COPYRIGHT©



1 **LEVEL 2 - EAST SNOW LOAD PLAN**
1/8" = 1'-0"



2 **LEVEL 3 - EAST SNOW LOAD PLAN**
1/8" = 1'-0"



3 **ROOF - EAST SNOW LOAD PLAN**
1/8" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

Studio NYL
2995 Baseline Road, #314 303.558.3145
Boulder, Colorado 80303 www.studnyl.com
Boulder | Denver | Colorado Springs | Reston | Minneapolis

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21009

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

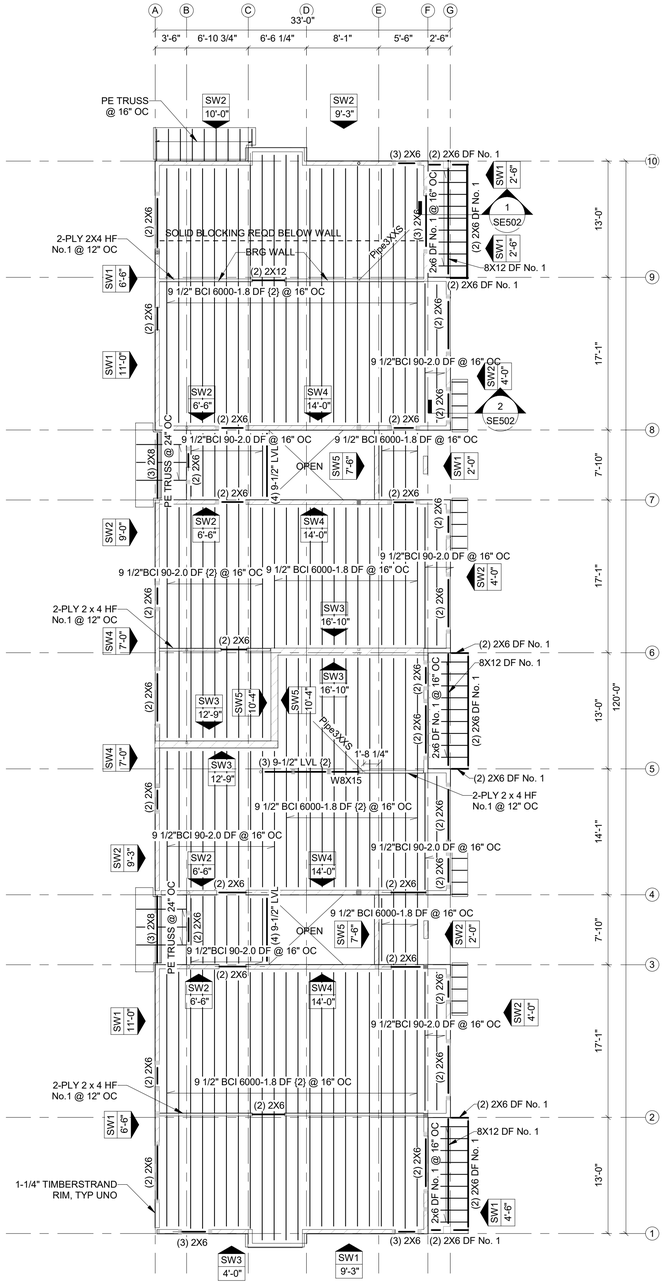
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

SNOW LOAD PLANS

SE100

PLOT DATE: 3/22/2022 10:40:37 AM

COPYRIGHT©

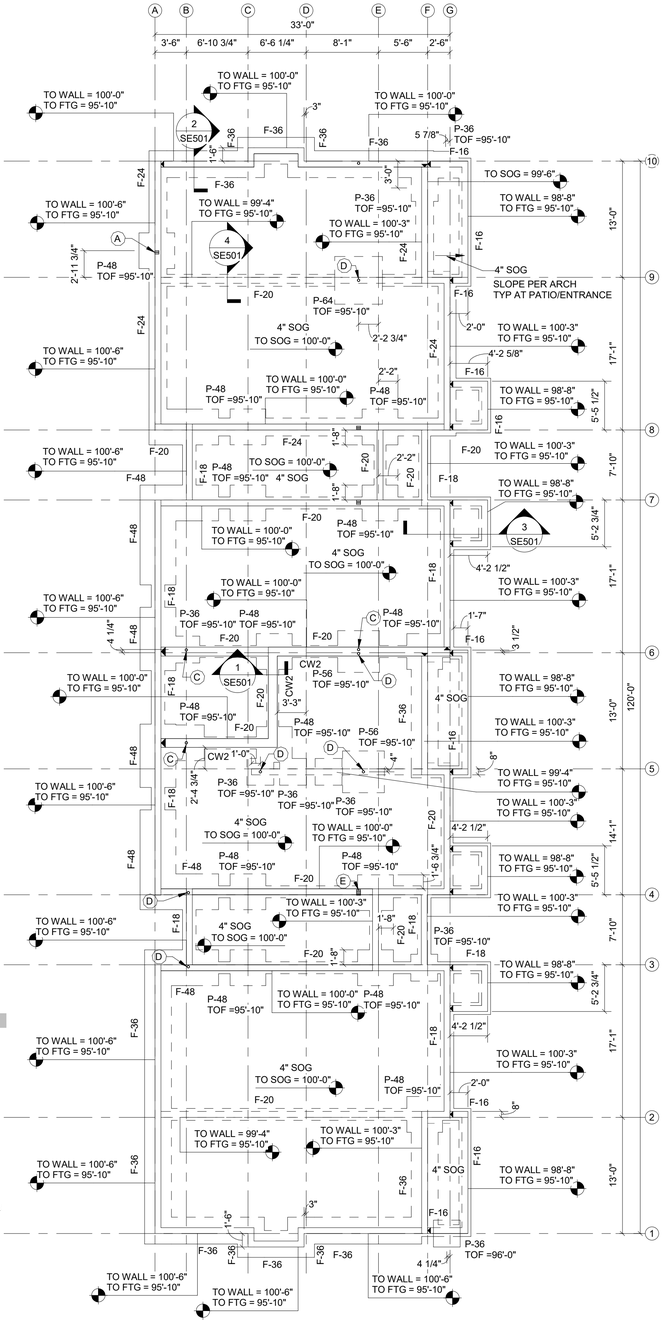


LVL 1 WALLS:
- TYP INTERIOR BRG WALL - 2 x 4 HF No. 1 @ 12" OC UNO
- TYP INTERIOR DEMISING WALL - 2 x 4 HF No. 1 @ 12" OC EA SIDE
- TYP EXTERIOR BRG WALL - 2 x 6 HF No.2 @ 16" OC

2 LEVEL 2 - EAST
1/8" = 1'-0"

FLOOR FRAMING PLAN NOTES

- REFER TO GENERAL STRUCTURAL NOTES FOR ADDITIONAL INFORMATION.
- VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS.
- VERIFY SITE DATUM WITH ARCHITECTS DRAWINGS.
- CONTRACTOR SHALL VERIFY ALL FIELD DIMENSIONS PRIOR TO CONSTRUCTION.
- DETAILS ARE NOT CUT AT EVERY LOCATION THEY OCCUR. IF A CONDITION IS UNCLEAR, CONTACT ARCHITECT IMMEDIATELY BEFORE PROCEEDING.
- COORDINATE ALL OPENINGS THROUGH STRUCTURAL MEMBERS W/ ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND CIVIL DRAWINGS. TRIM OPENINGS AS SHOWN ON PLANS.
- SEE MECH, ELECT, AND CIVIL DRAWINGS FOR SLEEVE LOCATIONS. PIPES, CONDUITS AND OTHER PENETRATIONS NOT SHOWN SHALL NOT PASS THROUGH MASONRY WALLS AND COLUMNS, CONCRETE WALLS, BEAMS AND COLUMNS OR STEEL BEAMS OR COLUMNS WITHOUT PRIOR APPROVAL FROM STRUCTURAL ENGINEER OF RECORD.
- REFER TO ARCHITECTURAL DRAWINGS FOR FIRE RATING AND UL DESIGN NUMBER.
- FOR MISCELLANEOUS STEEL NOT SHOWN ON PLANS, SEE GENERAL STRUCTURAL NOTES AND GRAPHICAL GENERAL NOTES
- PRELIMINARY ELEVATIONS SHOWN ARE BASED ON INFORMATION PROVIDED BY THE ARCHITECT AND ARE SUBJECT TO CHANGE.
- TOP OF STEEL IS NOTED THUS (###'-## ##/##").
- ALL COMPOSITE STEEL BEAMS ARE DESIGNED FOR UNSHORED CONSTRUCTION. DO NOT SHORE COMPOSITE BEAMS WITHOUT PERMISSION OF ENGINEER OF RECORD
- REFER TO GRAPHICAL GENERAL NOTES FOR HEADERS, BEARING STUDS (T, TRIMMER STUDS) AND WIND STUDS (KS, KING STUDS). PROVIDE MINIMUM (2) 2x TRIMMER STUDS UNDER EACH BEAM OR HEADER AND (2) 2x KING STUDS EACH END WHERE NOT NOTED ON PLAN.
- SHEARWALLS SHOWN ARE FROM LEVEL BELOW TO PLAN LEVEL.
- WALL STUDS SHALL BE PER STUD SCHEDULE ON PLAN
- STEEL BEAM SHEAR CONN SHALL BE PER GGN ST-16 UNO
- ROOF SHEATHING SHALL BE 23/32" PLYWOOD OR O.S.B. (48/24 RATING) ATTACHED TO FRAMING W/ 0.148ø NAILS SPACED AT 4" OC ALONG ALL PANEL EDGES AND 12" OC IN THE FIELD, MIN 1-1/2" PEN INTO FRAMING (UNBLOCKED)
- FLOOR SHEATHING SHALL BE 23/32" PLYWOOD OR O.S.B. (24 OC RATING) ATTACHED TO FRAMING W/ 0.148ø NAILS SPACED AT 4" OC ALONG ALL PANEL EDGES AND 12" OC IN THE FIELD, MIN 1-1/2" PEN INTO FRAMING (UNBLOCKED)



FOUNDATION:
- TYP STRIP FTG TO BE 16" WIDE X 12" DEEP. REINF W/ (2) #5 T&B LONG
- ISOLATED FTG P-36 TO BE 36"x36"x12". REINF W/ (5) #5 EA WAY.
- ISOLATED FTG P-48 TO BE 48"x48"x12". REINF W/ (8) #5 EA WAY.
- FROST DEPTH = 40" PER GEOTECH

1 FOUNDATION PLAN - EAST
1/8" = 1'-0"

STRUCTURAL COLUMN SCHEDULE

MARK	TYPE
A	(3) 2x6 HF #2
B	(4) 2x6 HF #2
C	Pipe3STD
D	Pipe3XXS
E	(6) 2x6 HF #2

CONCRETE WALL SCHEDULE

MARK	WIDTH	REINFORCING
CW1	8"	(2)#5 T&B (HORIZ) #4 EA FACE @16" OC HORIZ, #4 VERTS @16" OC EA FACE
CW2	1'-0"	(2)#5 T&B (HORIZ) #4 EA FACE @16" OC HORIZ, #4 VERTS @12" OC EA FACE

ALL WALLS CW1 UNO

STRIP FOOTING SCHEDULE

MARK	WIDTH	THICKNESS	REINFORCING
F-16	1'-4"	1'-0"	(3) #5 LONG, #5@12" OC TRANS
F-18	1'-6"	1'-0"	(3) #5 LONG, #5@12" OC TRANS
F-20	1'-8"	1'-0"	(3) #5 LONG, #5@12" OC TRANS
F-24	2'-0"	1'-0"	(3) #5 LONG, #5@12" OC TRANS
F-36	3'-0"	1'-0"	(3) #5 LONG, #5@12" OC TRANS
F-48	4'-0"	1'-0"	(3) #5 LONG, #5@12" OC TRANS

ISOLATED FOOTING SCHEDULE

MARK	LENGTH	WIDTH	THICKNESS	REINFORCING
P-36	3'-0"	3'-0"	1'-0"	(4)#5 EA WAY T+B
P-48	4'-0"	4'-0"	1'-0"	(5)#5 EA WAY T+B
P-56	4'-8"	4'-8"	1'-0"	(6)#5 EA WAY T+B
P-64	5'-4"	5'-4"	1'-4"	(7)#5 EA WAY T+B

FOUNDATION PLAN NOTES

- REFER TO GENERAL STRUCTURAL NOTES FOR ADDITIONAL INFORMATION.
- VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS.
- VERIFY SITE DATUM WITH ARCHITECTS DRAWINGS.
- CONTRACTOR SHALL VERIFY ALL FIELD DIMENSIONS PRIOR TO CONSTRUCTION.
- DETAILS ARE NOT CUT AT EVERY LOCATION THEY OCCUR. IF A CONDITION IS UNCLEAR, CONTACT ARCHITECT IMMEDIATELY BEFORE PROCEEDING.
- COORDINATE ALL OPENINGS THROUGH STRUCTURAL MEMBERS W/ ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND CIVIL DRAWINGS. TRIM OPENINGS AS SHOWN ON PLANS.
- SEE MECH, ELECT, AND CIVIL DRAWINGS FOR SLEEVE LOCATIONS. PIPES, CONDUITS AND OTHER PENETRATIONS NOT SHOWN SHALL NOT PASS THROUGH MASONRY WALLS AND COLUMNS, CONCRETE WALLS, BEAMS AND COLUMNS OR STEEL BEAMS OR COLUMNS WITHOUT PRIOR APPROVAL FROM STRUCTURAL ENGINEER OF RECORD.
- REFER TO ARCHITECTURAL DRAWINGS FOR FIRE RATING AND UL DESIGN NUMBER.
- FOR MISCELLANEOUS STEEL NOT SHOWN ON PLANS, SEE GENERAL STRUCTURAL NOTES AND GRAPHICAL GENERAL NOTES
- PRELIMINARY ELEVATIONS SHOWN ARE BASED ON INFORMATION PROVIDED BY THE ARCHITECT AND ARE SUBJECT TO CHANGE.
- VERIFY EXACT LOCATION OF STEPS, RAMPS, DEPRESSED AND/OR RAISED AREAS OF SLAB-ON-GRADE WITH ARCHITECTURAL DRAWINGS.
- SLAB ON GRADE SHALL BE CONCRETE REINFORCED W/ 6x6-W2.1xW2.1 WWF UNO
- ALL CONCRETE WALL REINFORCING INDICATED ON PLAN SHALL BE FULL HEIGHT OF WALL UNO.
- ALL FOOTINGS TO BE CENTERED ON FOUNDATION WALLS UNO.
- ALL DRILLED PIERS SHALL BE CONSTRUCTED PER RECOMMENDATIONS IN GEOTECH REPORT.
- P1, P2, ETC – AS SHOWN ON PLANS INDICATES CONCRETE PIER CAP, SEE SCHEDULE THIS SHEET.
- PRECAST SITTTING ON CAST IN PLACE GRADE BEAMS AND CAPS, NEED TYPICAL EMBED PLATES, SIZE PER PRECAST MANUFACTURER
- FOR ANCHOR BOLT SPACING AND HOLD-DOWNS REQUIRED AT SHEAR WALLS, REFER TO FRAMING PLAN AND SHEARWALL SCHEDULE.

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

Studio NYL
2995 Baseline Road, #314 303.558.3145
Boulder, Colorado 80303 www.studnyl.com
Boulder | Denver | Colorado Springs | Reston | Minneapolis

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

0" 1" THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21009

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

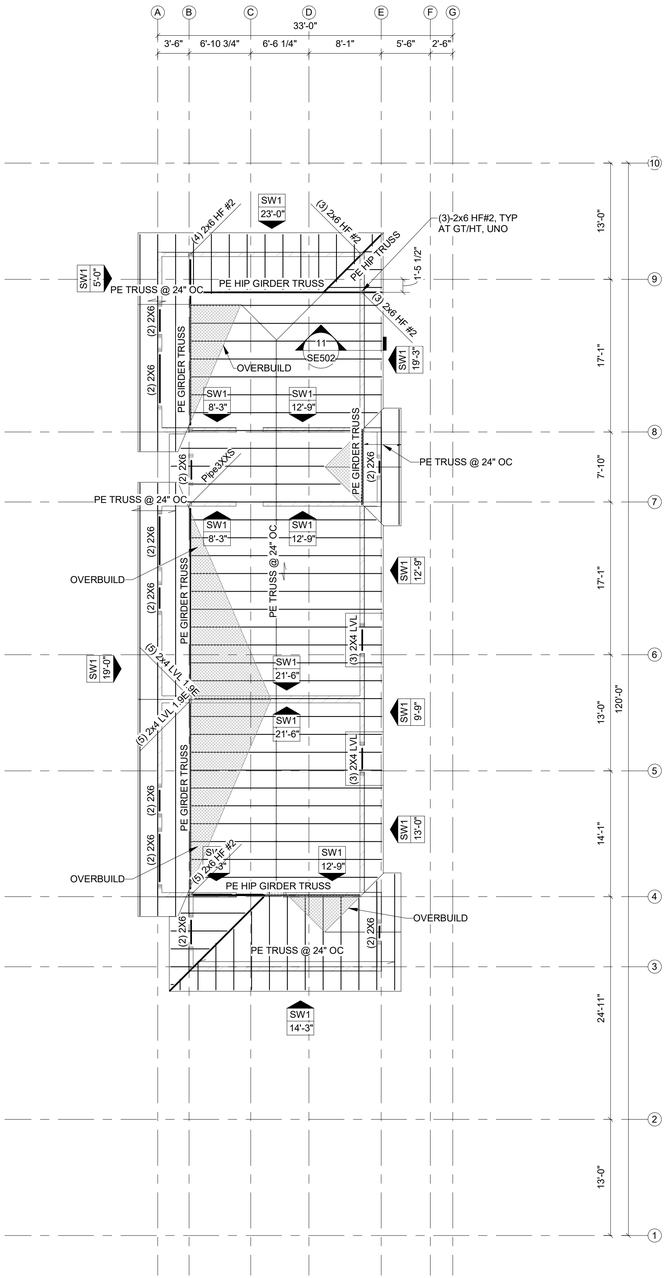
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

FOUNDATION & LEVEL 2 PLAN - EAST BUILDING

SE101

PLOT DATE: 3/22/2022 10:40:38 AM

COPYRIGHT©

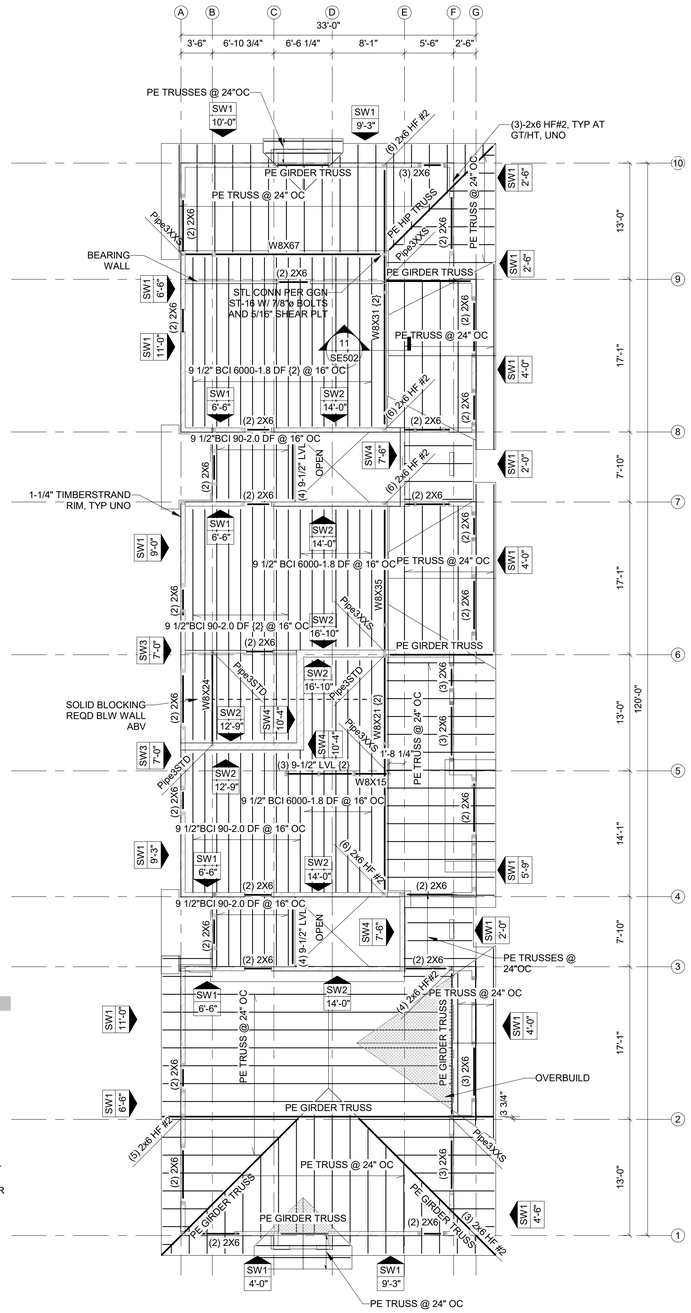


ROOF FRAMING PLAN NOTES

- REFER TO GENERAL STRUCTURAL NOTES FOR ADDITIONAL INFORMATION.
- VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS.
- VERIFY SITE DATUM WITH ARCHITECTS DRAWINGS.
- CONTRACTOR SHALL VERIFY ALL FIELD DIMENSIONS PRIOR TO CONSTRUCTION.
- DETAILS ARE NOT CUT AT EVERY LOCATION THEY OCCUR. IF A CONDITION IS UNCLEAR, CONTACT ARCHITECT IMMEDIATELY BEFORE PROCEEDING.
- COORDINATE ALL OPENINGS THROUGH STRUCTURAL MEMBERS W/ ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND CIVIL DRAWINGS. TRIM OPENINGS AS SHOWN ON PLANS.
- SEE MECH, ELECT, AND CIVIL DRAWINGS FOR SLEEVE LOCATIONS. PIPES, CONDUITS AND OTHER PENETRATIONS NOT SHOWN SHALL NOT PASS THROUGH MASONRY WALLS AND COLUMNS, CONCRETE WALLS, BEAMS AND COLUMNS OR STEEL BEAMS OR COLUMNS WITHOUT PRIOR APPROVAL FROM STRUCTURAL ENGINEER OF RECORD.
- REFER TO ARCHITECTURAL DRAWINGS FOR FIRE RATING AND UL DESIGN NUMBER.
- FOR MISCELLANEOUS STEEL NOT SHOWN ON PLANS, SEE GENERAL STRUCTURAL NOTES AND GRAPHICAL GENERAL NOTES
- PRELIMINARY ELEVATIONS SHOWN ARE BASED ON INFORMATION PROVIDED BY THE ARCHITECT AND ARE SUBJECT TO CHANGE.
- TOP OF STEEL IS NOTED THUS (####.## ######").
- SHEARWALLS SHOWN ARE FROM LEVEL BELOW TO PLAN LEVEL.
- REFER TO GRAPHICAL GENERAL NOTES FOR HEADERS, BEARING STUDS (T, TRIMMER STUDS) AND WIND STUDS (KS, KING STUDS). PROVIDE MINIMUM (2) 2x TRIMMER STUDS UNDER EACH BEAM OR HEADER AND (2) 2x KING STUDS EACH END WHERE NOT NOTED ON PLAN.
- WALL STUDS SHALL BE PER STUD SCHEDULE ON PLAN.
- STEEL BEAM SHEAR CONN SHALL BE PER GGN ST-XX UNO

LVL 3 WALLS:
- TYP INTERIOR DEMISING WALL - 2 x 4 HF No.1 @ 16" OC EA SIDE
- TYP EXTERIOR BRG WALL - 2 x 6 HF No.2 @ 16" OC

2 ROOF - EAST
1/8" = 1'-0"



LVL 2 WALLS:
- TYP INTERIOR BRG WALL - 2 x 4 HF No.2 @ 12" OC UNO
- TYP INTERIOR DEMISING WALL -2 x 4 HF No.2 @ 16" OC EA SIDE
- TYP EXTERIOR BRG WALL - 2 x 6 HF No.2 @ 16" OC

1 LEVEL 3 - EAST
1/8" = 1'-0"

FLOOR FRAMING PLAN NOTES

- REFER TO GENERAL STRUCTURAL NOTES FOR ADDITIONAL INFORMATION.
- VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS.
- VERIFY SITE DATUM WITH ARCHITECTS DRAWINGS.
- CONTRACTOR SHALL VERIFY ALL FIELD DIMENSIONS PRIOR TO CONSTRUCTION.
- DETAILS ARE NOT CUT AT EVERY LOCATION THEY OCCUR. IF A CONDITION IS UNCLEAR, CONTACT ARCHITECT IMMEDIATELY BEFORE PROCEEDING.
- COORDINATE ALL OPENINGS THROUGH STRUCTURAL MEMBERS W/ ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND CIVIL DRAWINGS. TRIM OPENINGS AS SHOWN ON PLANS.
- SEE MECH, ELECT, AND CIVIL DRAWINGS FOR SLEEVE LOCATIONS. PIPES, CONDUITS AND OTHER PENETRATIONS NOT SHOWN SHALL NOT PASS THROUGH MASONRY WALLS AND COLUMNS, CONCRETE WALLS, BEAMS AND COLUMNS OR STEEL BEAMS OR COLUMNS WITHOUT PRIOR APPROVAL FROM STRUCTURAL ENGINEER OF RECORD.
- REFER TO ARCHITECTURAL DRAWINGS FOR FIRE RATING AND UL DESIGN NUMBER.
- FOR MISCELLANEOUS STEEL NOT SHOWN ON PLANS, SEE GENERAL STRUCTURAL NOTES AND GRAPHICAL GENERAL NOTES
- PRELIMINARY ELEVATIONS SHOWN ARE BASED ON INFORMATION PROVIDED BY THE ARCHITECT AND ARE SUBJECT TO CHANGE.
- TOP OF STEEL IS NOTED THUS (####.## ######").
- ALL COMPOSITE STEEL BEAMS ARE DESIGNED FOR UNSHORED CONSTRUCTION. DO NOT SHORE COMPOSITE BEAMS WITHOUT PERMISSION OF ENGINEER OF RECORD
- REFER TO GRAPHICAL GENERAL NOTES FOR HEADERS, BEARING STUDS (T, TRIMMER STUDS) AND WIND STUDS (KS, KING STUDS). PROVIDE MINIMUM (2) 2x TRIMMER STUDS UNDER EACH BEAM OR HEADER AND (2) 2x KING STUDS EACH END WHERE NOT NOTED ON PLAN.
- SHEARWALLS SHOWN ARE FROM LEVEL BELOW TO PLAN LEVEL.
- WALL STUDS SHALL BE PER STUD SCHEDULE ON PLAN
- STEEL BEAM SHEAR CONN SHALL BE PER GGN ST-16 UNO
- ROOF SHEATHING SHALL BE 23/32" PLYWOOD OR O.S.B. (48/24 RATING) ATTACHED TO FRAMING W/ 0.148a NAILS SPACED AT 4" OC ALONG ALL PANEL EDGES AND 12" OC IN THE FIELD, MIN 1-1/2" PEN INTO FRAMING (UNBLOCKED)
- FLOOR SHEATHING SHALL BE 23/32" PLYWOOD OR O.S.B. (24 OC RATING) ATTACHED TO FRAMING W/ 0.148a NAILS SPACED AT 4" OC ALONG ALL PANEL EDGES AND 12" OC IN THE FIELD, MIN 1-1/2" PEN INTO FRAMING (UNBLOCKED)

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

Studio NYL
2995 Baseline Road, #314 303.558.3145
Boulder, Colorado 80303 www.studionyl.com
Boulder, Denver | Colorado Springs | Reston | Minneapolis

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

0" 1" THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21009

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

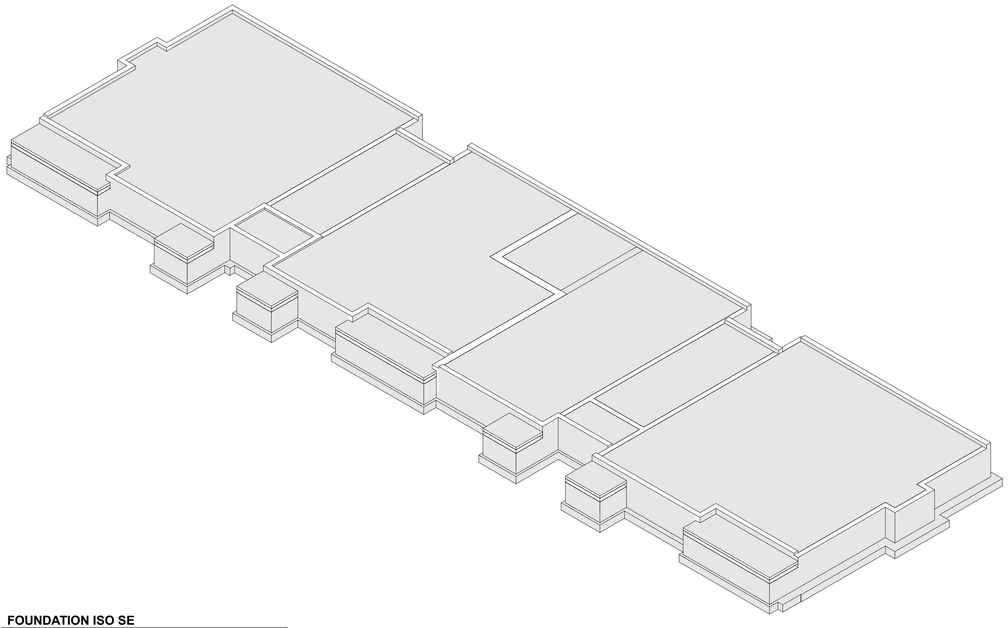
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

LEVEL 3 & ROOF PLAN - EAST BUILDING

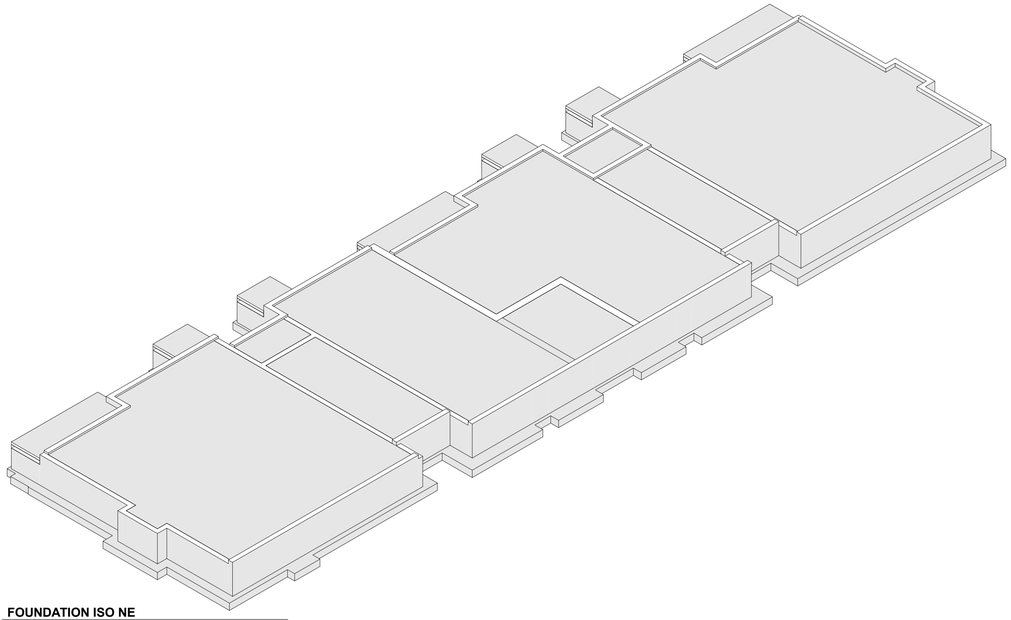
SE102

PLOT DATE: 3/22/2022 10:40:38 AM

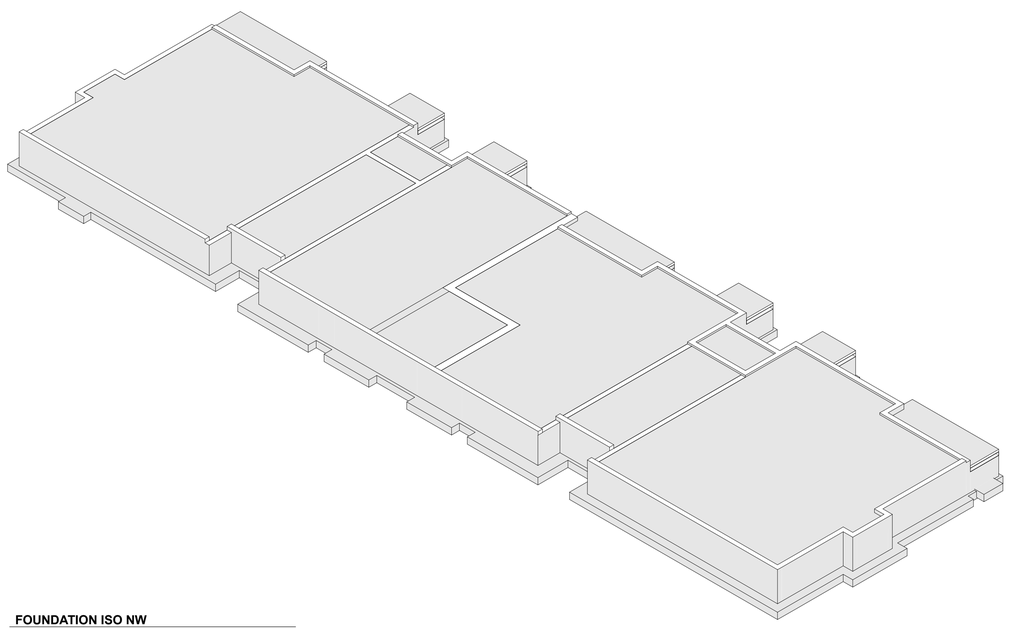
COPYRIGHT©



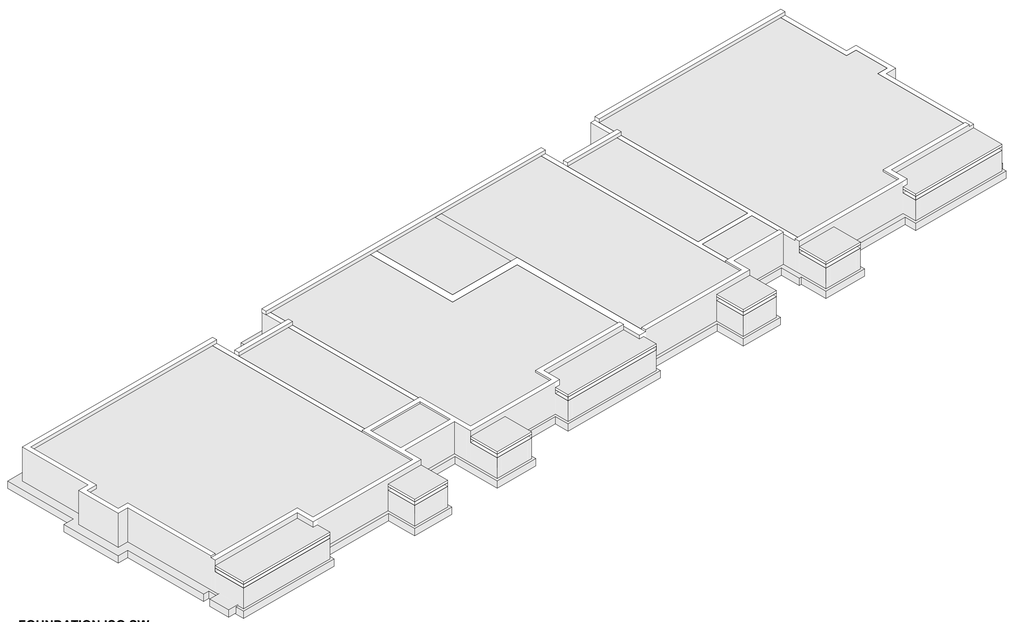
FOUNDATION ISO SE



FOUNDATION ISO NE



FOUNDATION ISO NW



FOUNDATION ISO SW

NOTE: ISO VIEWS ARE FOR GRAPHICAL REPRESENTATION ONLY. USE PLAN AND DETAIL INFO ONLY

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

Studio NYL
2995 Baseline Road, #314 303.558.3145
Boulder, Colorado 80303 www.studnyl.com
Boulder | Denver | Colorado Springs | Reston | Minneapolis

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

0' 1'

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21009

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

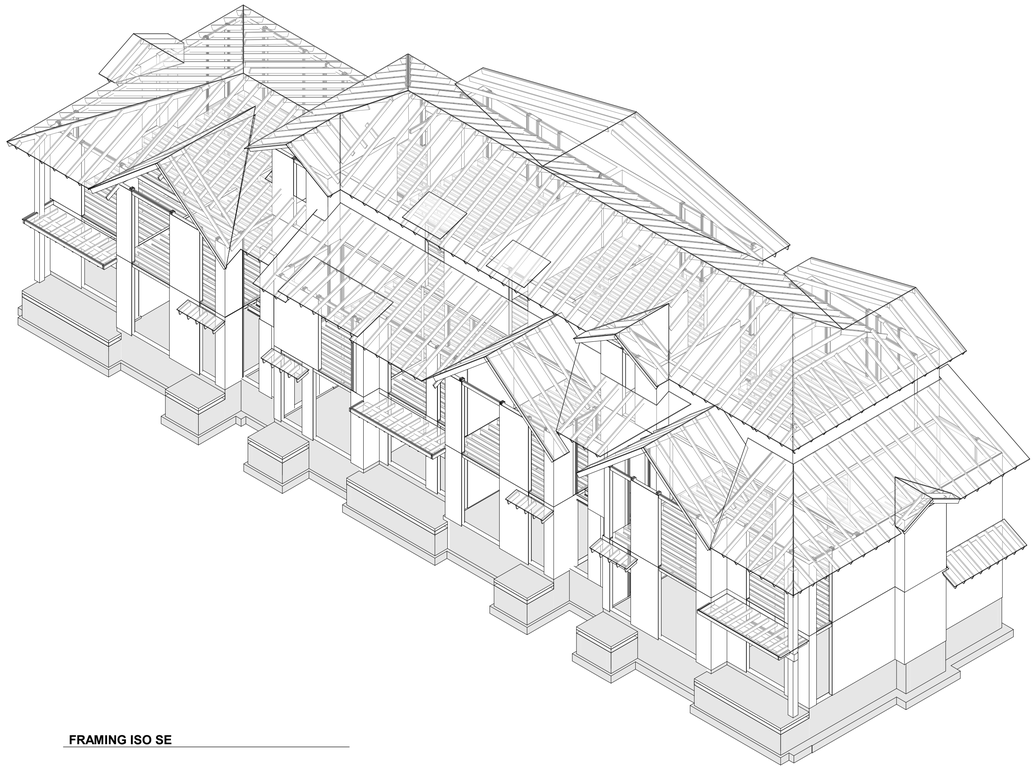
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

FOUNDATION
ISOMETRIC VIEWS

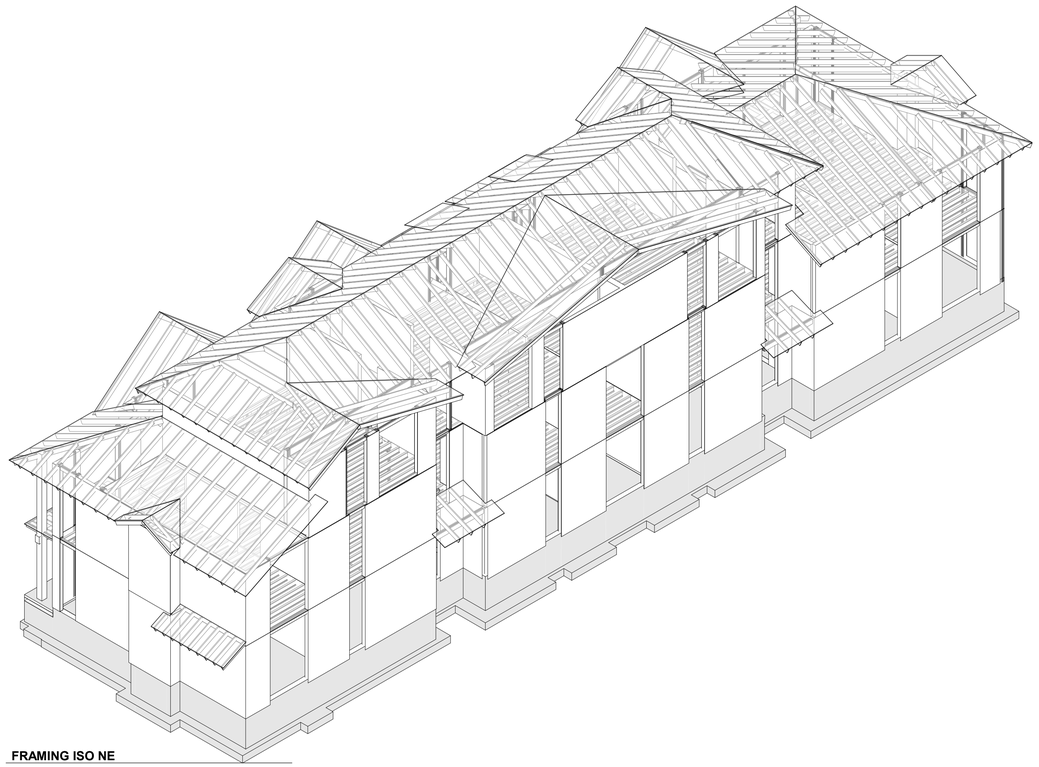
SE201

PLOT DATE: 3/22/2022 10:40:39 AM

COPYRIGHT©

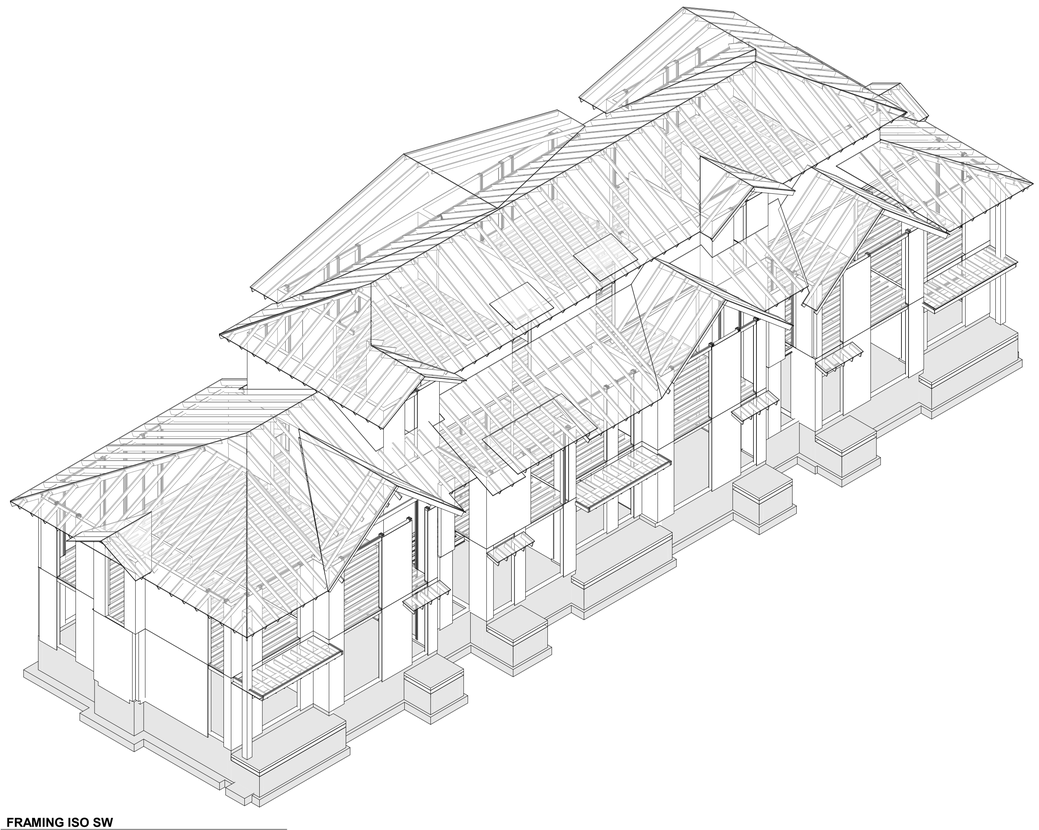


FRAMING ISO SE



FRAMING ISO NE

FRAMING ISO NW



FRAMING ISO SW

NOTE: ISO VIEWS ARE FOR GRAPHICAL REPRESENTATION ONLY. USE PLAN AND DETAIL INFO ONLY

PLOT DATE: 3/22/2022 10:40:42 AM

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

Studio NYL
2995 Baseline Road, #314 303.558.3145
Boulder, Colorado 80303 www.studnyl.com
Boulder | Denver | Colorado Springs | Reston | Minneapolis

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21009

Sheet Issue & Revision Log

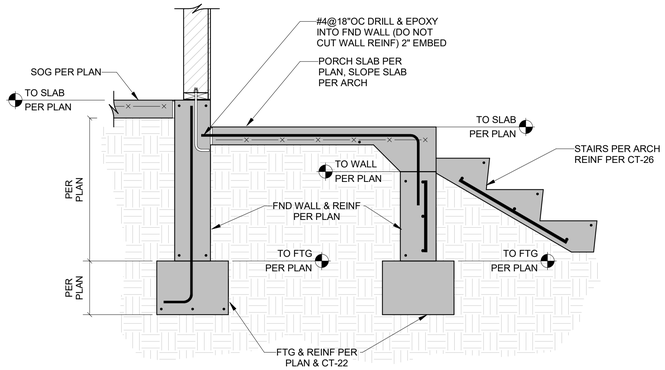
No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

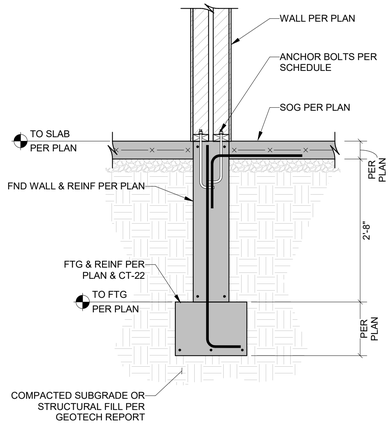
FRAMING ISOMETRIC VIEWS

SE202

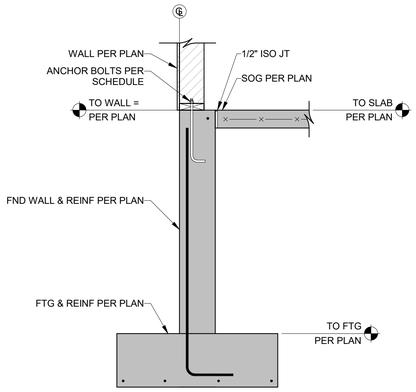
COPYRIGHT©



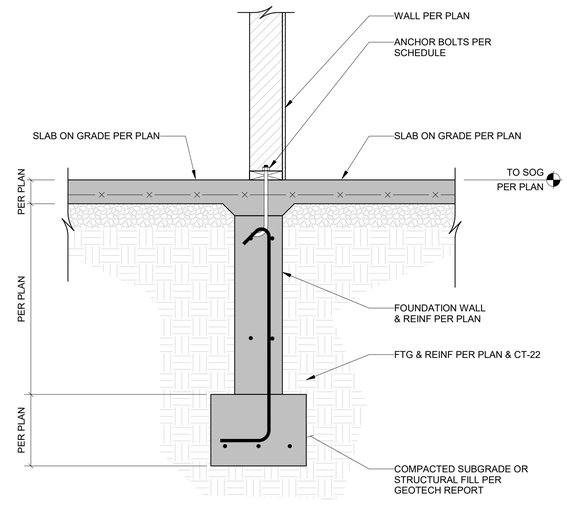
3 SECTION AT ENTRANCE/ STAIR
3/4" = 1'-0"



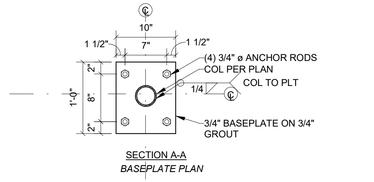
1 DEMISING WALL SECTION
3/4" = 1'-0"

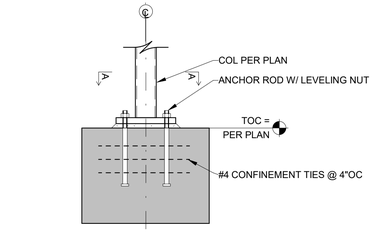


2 SECTION AT EXTERIOR WALL
3/4" = 1'-0"

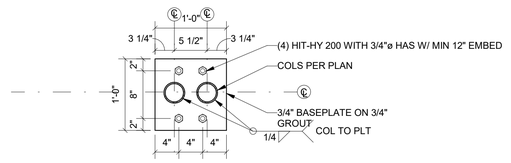


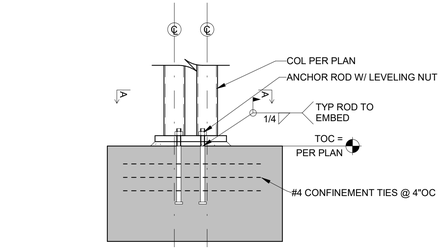
4 INTERIOR BEARING WALL
1" = 1'-0"





5 BP-1
1" = 1'-0"





6 BP-2
1" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

Studio NYL
2995 Baseline Road, #314 303.558.3145
Boulder, Colorado 80303 www.studnyl.com
Boulder | Denver | Colorado Springs | Austin | Minneapolis

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21009

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

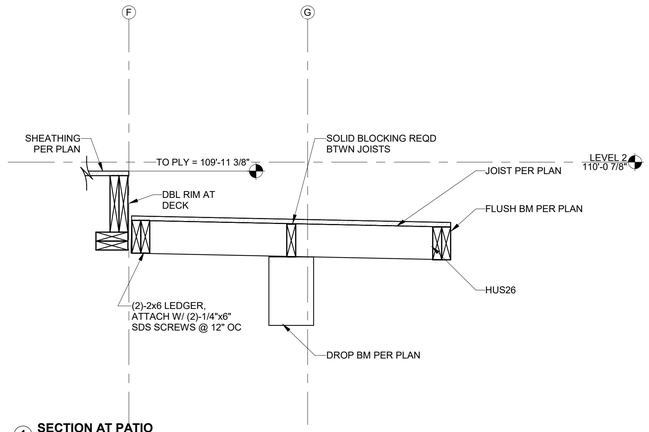
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

FOUNDATION DETAILS

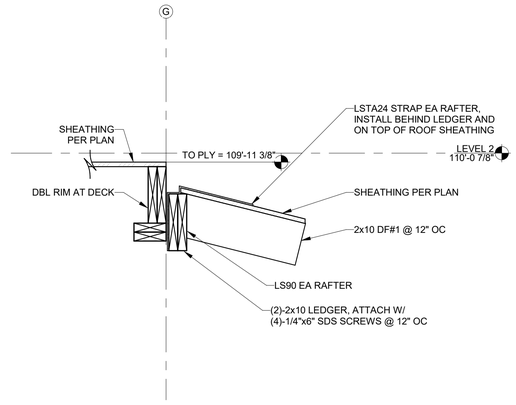
SE501

PLOT DATE: 3/22/2022 10:40:43 AM

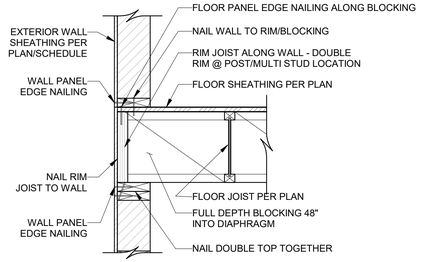
COPYRIGHT©



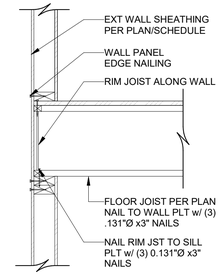
1 SECTION AT PATIO
1" = 1'-0"



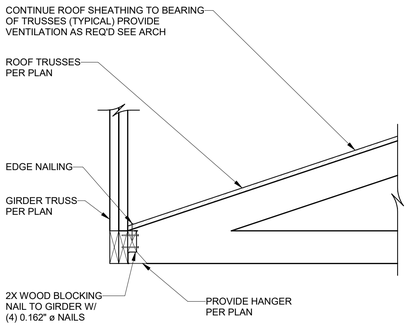
2 EYEBROW ROOF DETAIL
1" = 1'-0"



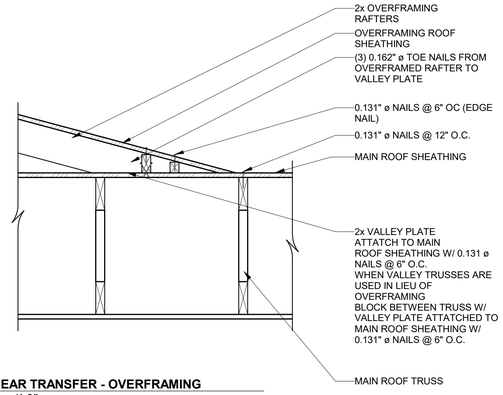
3 JOIST PARALLEL TO EXTERIOR BEARING WALL
1" = 1'-0"



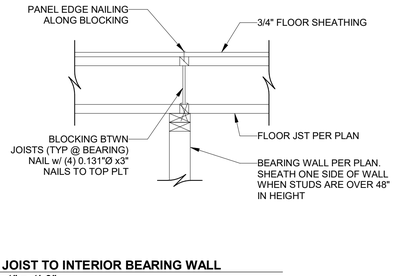
4 JOIST TO EXTERIOR WALL BEARING
1" = 1'-0"



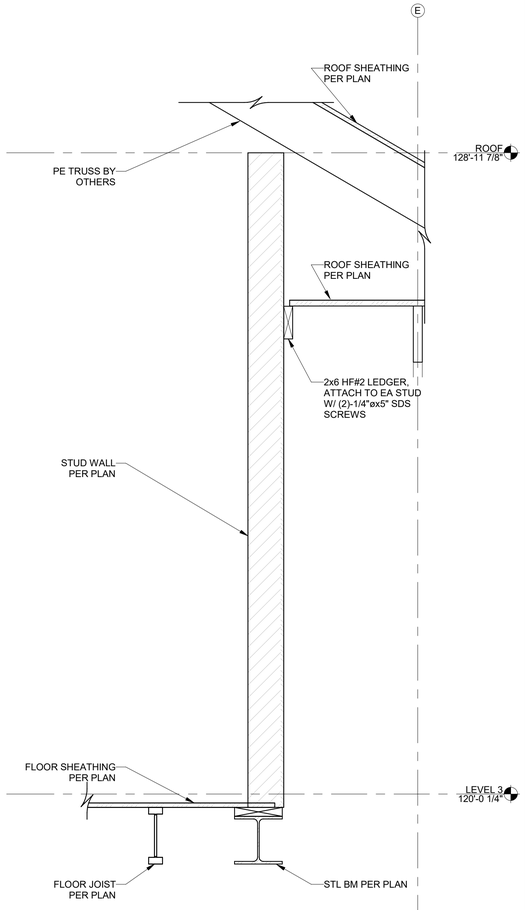
5 GIRDER TRUSS DETAIL
1" = 1'-0"



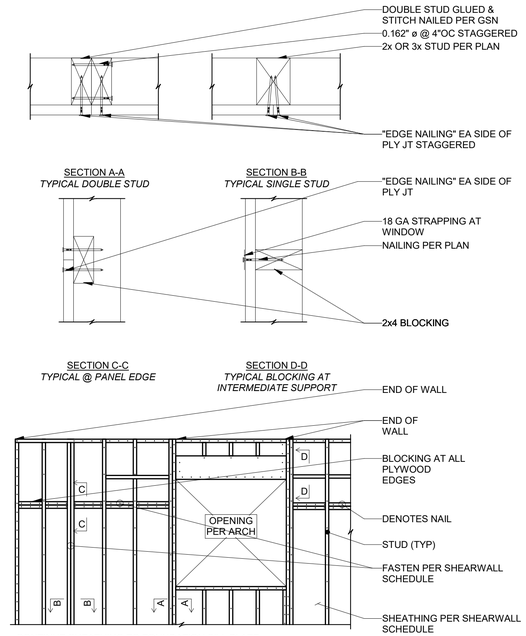
6 SHEAR TRANSFER - OVERFRAMING
1" = 1'-0"



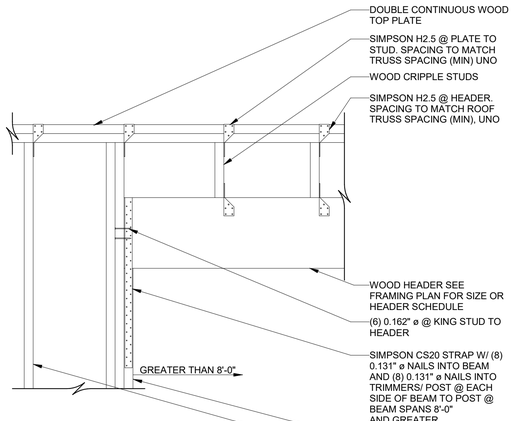
7 JOIST TO INTERIOR BEARING WALL
1" = 1'-0"



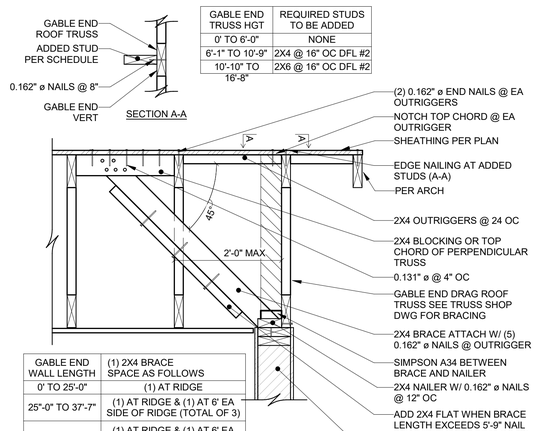
11 Section 41
1" = 1'-0"



8 SHEARWALL ELEVATION
3/8" = 1'-0"



9 STRAPPING BEARING (ROOF ONLY)
NTS



GABLE END TRUSS HGT	REQUIRED STUDS TO BE ADDED
0' TO 6'-0"	NONE
6'-1" TO 10'-9"	2X4 @ 16" OC DFL #2
10'-10" TO 16'-8"	2X6 @ 16" OC DFL #2

GABLE END WALL LENGTH	(1) 2X4 BRACE SPACE AS FOLLOWS
0' TO 25'-0"	(1) AT RIDGE
25'-0" TO 37'-7"	(1) AT RIDGE & (1) AT 6' EA SIDE OF RIDGE (TOTAL OF 3)
OVER 37'-8"	(1) AT RIDGE & (1) AT 6' EA SIDE OF RIDGE & (1) AT 12' EA SIDE OF RIDGE (TOTAL OF 5)

10 GABLE END SHEAR TRANSFER
1" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

NYL
Studio NYL
2995 Baseline Road, #314 303.558.3145
Boulder, Colorado 80303 www.studnyl.com
Boulder | Denver | Colorado Springs | Reston | Minneapolis

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21009

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

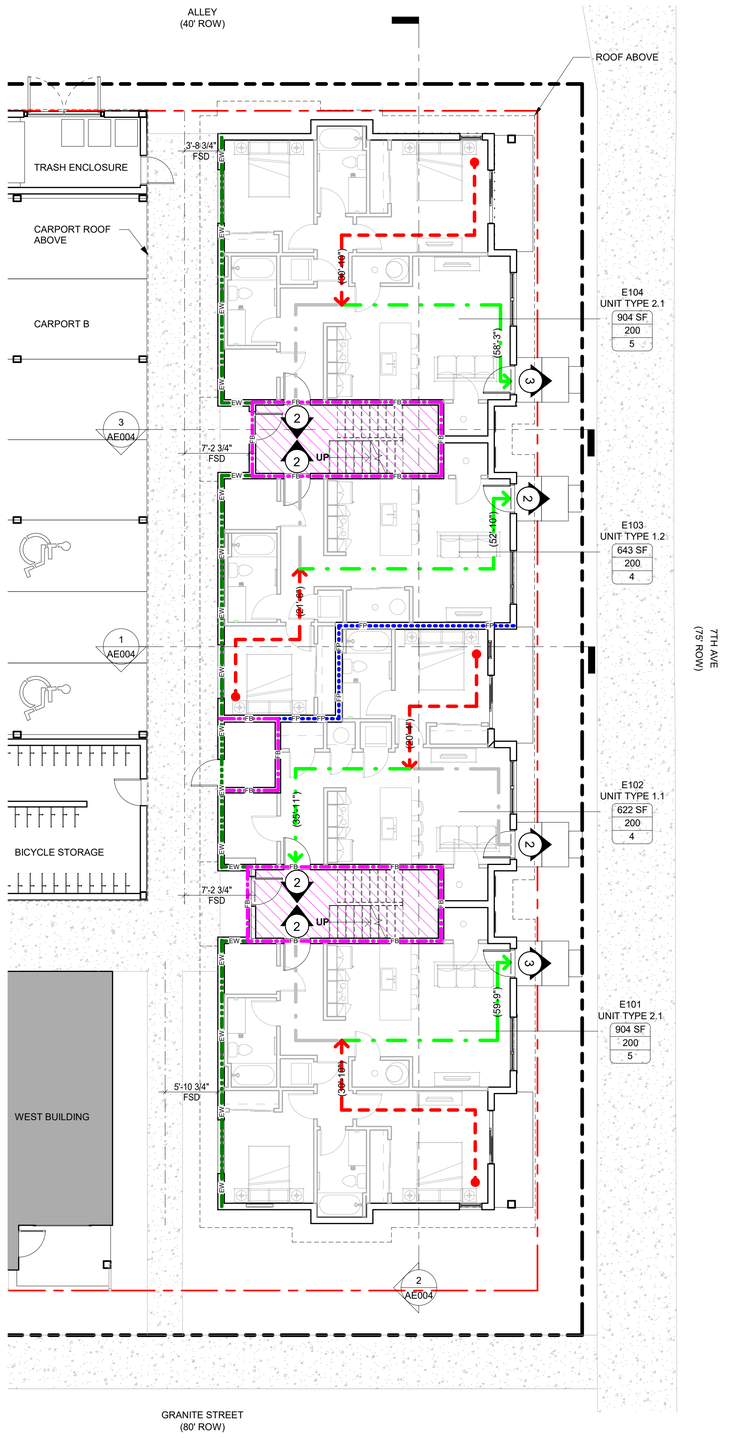
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

FRAMING DETAILS

SE502

PLOT DATE: 3/22/2022 10:40:44 AM

COPYRIGHT©



1 LEVEL 1 CODE PLAN - EAST BUILDING
1/8" = 1'-0"

GRAPHIC SCALE
0' 8' 16' 24' 32'

PLAN NORTH
TRUE NORTH

CODE SYMBOL LEGEND

- FIRE PARTITION - 1 HR
- EXTERIOR WALL - 1 HR
- FIRE BARRIER - 1 HR
- HORIZONTAL ASSEMBLY - 1 HR
- 10' — SEGMENT LENGTH — EGRESS PATH
- COMMON PATH OF TRAVEL
- SHAFT ENCLOSURE - 1 HR
- ROOF BELOW
- 101 — ROOM NUMBER
- Name — UNIT TYPE
- 3200 SF — TABULATED AREA
- 100 — OCCUPANCY LOAD FACTOR
- 5 — NUMBER OF OCCUPANTS
- 32 — NUMBER OF OCCUPANTS SERVED AT EXIT COMPONENT

COMMON PATH OF TRAVEL - 2018 IBC - EAST BUILDING

COMMON PATH ID	MAX COMMON PATH OF TRAVEL DISTANCE	ACTUAL COMMON PATH DISTANCE
UNIT E101 COMMON PATH	125' - 0"	30' - 10"
UNIT E102 COMMON PATH	125' - 0"	20' - 4"
UNIT E103 COMMON PATH	125' - 0"	21' - 6"
UNIT E104 COMMON PATH	125' - 0"	30' - 10"
UNIT E201 COMMON PATH	125' - 0"	54' - 5"
UNIT E202 COMMON PATH	125' - 0"	51' - 7"
UNIT E203 COMMON PATH	125' - 0"	41' - 1"
UNIT E204 COMMON PATH	125' - 0"	54' - 5"
UNIT E301 COMMON PATH	125' - 0"	28' - 2"
UNIT E302 COMMON PATH	125' - 0"	28' - 2"
UNIT E303 COMMON PATH	125' - 0"	31' - 2"

EGRESS PATH OF TRAVEL - 2018 IBC - EAST BUILDING

EGRESS PATH ID	MAX EGRESS PATH OF TRAVEL DISTANCE	TRAVEL DISTANCE PROVIDED
UNIT E101 EGRESS PATH	250' - 0"	59' - 9"
UNIT E102 EGRESS PATH	250' - 0"	35' - 11"
UNIT E103 EGRESS PATH	250' - 0"	52' - 10"
UNIT E104 EGRESS PATH	250' - 0"	58' - 3"

AREA SCHEDULE - OCCUPANCY - EAST BUILDING

UNIT	AREA	AREA FUNCTION	OCCUPANT LOAD FACTOR	OCCUPANTS
LEVEL 1 EAST				
E101	904 SF	RESIDENTIAL	200	5
E102	622 SF	RESIDENTIAL	200	4
E103	643 SF	RESIDENTIAL	200	4
E104	904 SF	RESIDENTIAL	200	5
	3,073 SF			18
LEVEL 2 EAST				
E201	904 SF	RESIDENTIAL	200	5
E202	622 SF	RESIDENTIAL	200	4
E203	643 SF	RESIDENTIAL	200	4
E204	904 SF	RESIDENTIAL	200	5
	3,073 SF			18
LEVEL 3 EAST				
E301	467 SF	RESIDENTIAL	200	3
E302	467 SF	RESIDENTIAL	200	3
E303	419 SF	RESIDENTIAL	200	3
	1,354 SF			9
Grand total	7,499 SF			45

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

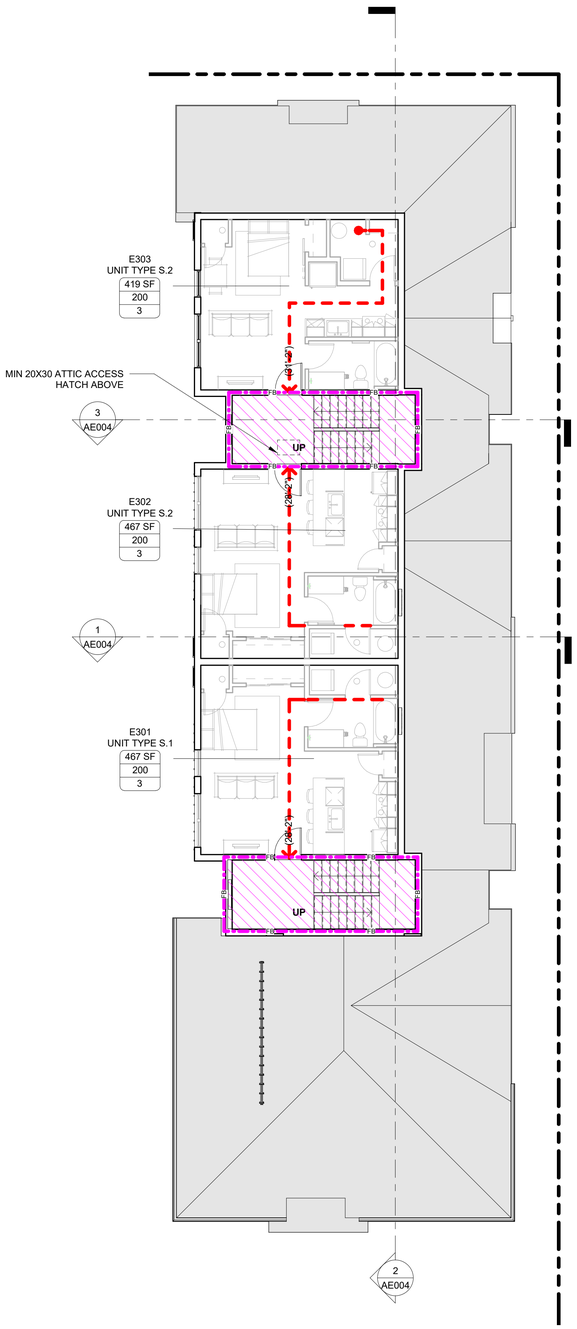
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

CODE PLAN LEVEL 1 - EAST BUILDING

AE001

PLOT DATE: 3/28/2022 3:01:33 PM

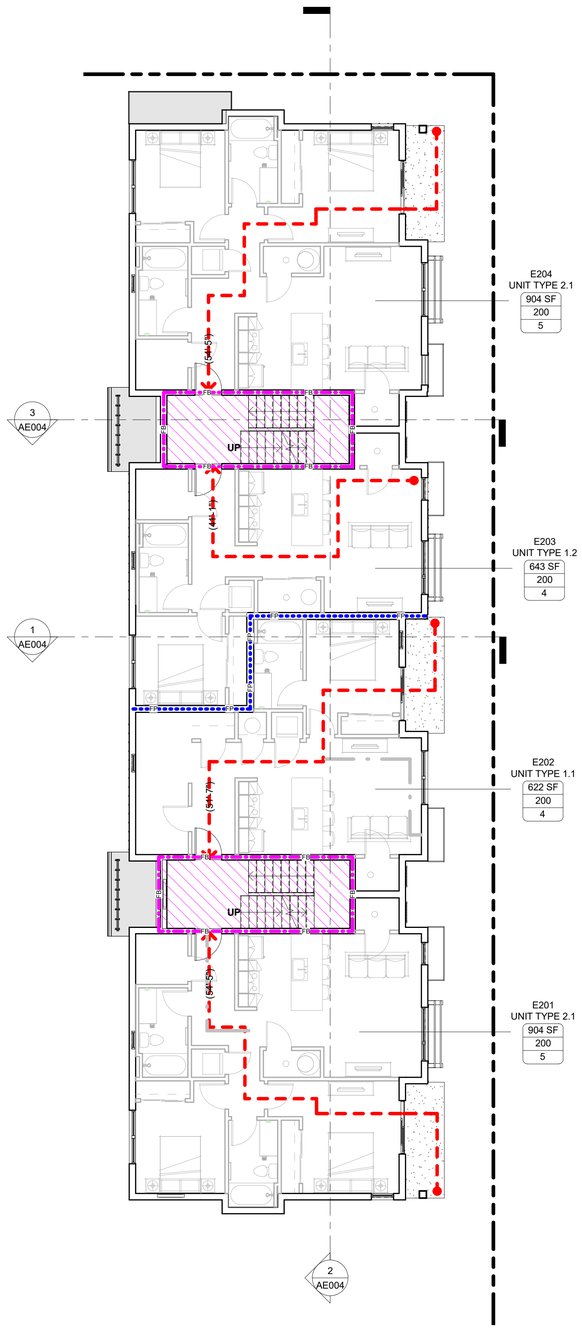
COPYRIGHT©



2/ LEVEL 3 CODE PLAN - EAST BUILDING
1/8" = 1'-0"

GRAPHIC SCALE
0' 8' 16' 24' 32'

PLAN NORTH TRUE NORTH



1/ LEVEL 2 CODE PLAN - EAST BUILDING
1/8" = 1'-0"

GRAPHIC SCALE
0' 8' 16' 24' 32'

PLAN NORTH TRUE NORTH

CODE SYMBOL LEGEND

- FIRE PARTITION - 1 HR
- EXTERIOR WALL - 1 HR
- FIRE BARRIER - 1 HR
- HORIZONTAL ASSEMBLY - 1 HR
- EGRESS PATH (10' SEGMENT LENGTH)
- COMMON PATH OF TRAVEL
- SHAFT ENCLOSURE - 1 HR
- ROOF BELOW
- 101 / Name / 3200 SF / 100 / 5 — ROOM NUMBER / UNIT TYPE / TABULATED AREA / OCCUPANCY LOAD FACTOR / NUMBER OF OCCUPANTS
- 32 — NUMBER OF OCCUPANTS SERVED AT EXIT COMPONENT

COMMON PATH OF TRAVEL - 2018 IBC - EAST BUILDING

COMMON PATH ID	MAX COMMON PATH OF TRAVEL DISTANCE	ACTUAL COMMON PATH DISTANCE
UNIT E101 COMMON PATH	125' - 0"	30' - 10"
UNIT E102 COMMON PATH	125' - 0"	20' - 4"
UNIT E103 COMMON PATH	125' - 0"	21' - 6"
UNIT E104 COMMON PATH	125' - 0"	30' - 10"
UNIT E201 COMMON PATH	125' - 0"	54' - 5"
UNIT E202 COMMON PATH	125' - 0"	51' - 7"
UNIT E203 COMMON PATH	125' - 0"	41' - 1"
UNIT E204 COMMON PATH	125' - 0"	54' - 5"
UNIT E301 COMMON PATH	125' - 0"	28' - 2"
UNIT E302 COMMON PATH	125' - 0"	28' - 2"
UNIT E303 COMMON PATH	125' - 0"	31' - 2"

EGRESS PATH OF TRAVEL - 2018 IBC - EAST BUILDING

EGRESS PATH ID	MAX EGRESS PATH OF TRAVEL DISTANCE	TRAVEL DISTANCE PROVIDED
UNIT E101 EGRESS PATH	250' - 0"	59' - 9"
UNIT E102 EGRESS PATH	250' - 0"	35' - 11"
UNIT E103 EGRESS PATH	250' - 0"	52' - 10"
UNIT E104 EGRESS PATH	250' - 0"	58' - 3"

AREA SCHEDULE - OCCUPANCY - EAST BUILDING

UNIT	AREA	AREA FUNCTION	OCCUPANT LOAD FACTOR	OCCUPANTS
LEVEL 1 EAST				
E101	904 SF	RESIDENTIAL	200	5
E102	622 SF	RESIDENTIAL	200	4
E103	643 SF	RESIDENTIAL	200	4
E104	904 SF	RESIDENTIAL	200	5
	3,073 SF			18
LEVEL 2 EAST				
E201	904 SF	RESIDENTIAL	200	5
E202	622 SF	RESIDENTIAL	200	4
E203	643 SF	RESIDENTIAL	200	4
E204	904 SF	RESIDENTIAL	200	5
	3,073 SF			18
LEVEL 3 EAST				
E301	467 SF	RESIDENTIAL	200	3
E302	467 SF	RESIDENTIAL	200	3
E303	419 SF	RESIDENTIAL	200	3
	1,354 SF			9
Grand total	7,499 SF			45

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

CODE PLANS LEVEL 2 &3 - EAST BUILDING

AE002

PLOT DATE: 3/28/2022 3:01:38 PM

COPYRIGHT©

2 WEST ELEVATION - CODE - EAST BUILDING
1/8" = 1'-0"

1 EAST ELEVATION - CODE - EAST BUILDING
1/8" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

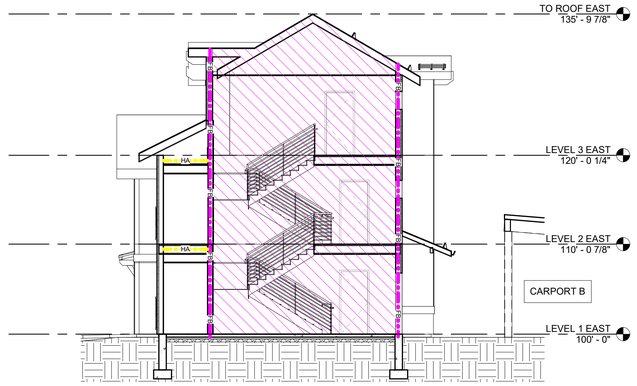
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

CODE ELEVATIONS - EAST BUILDING

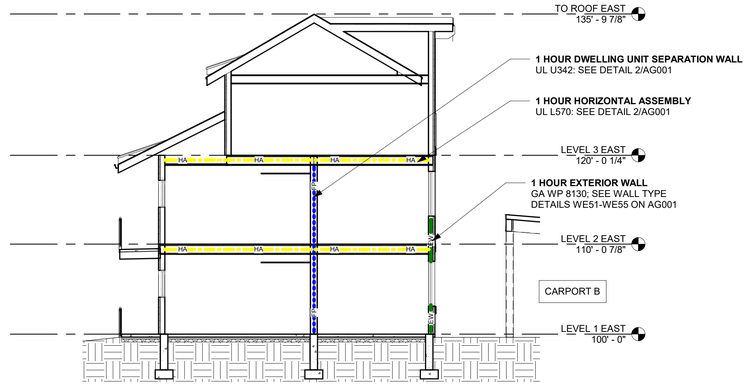
AE003

PLOT DATE: 3/28/2022 3:01:41 PM

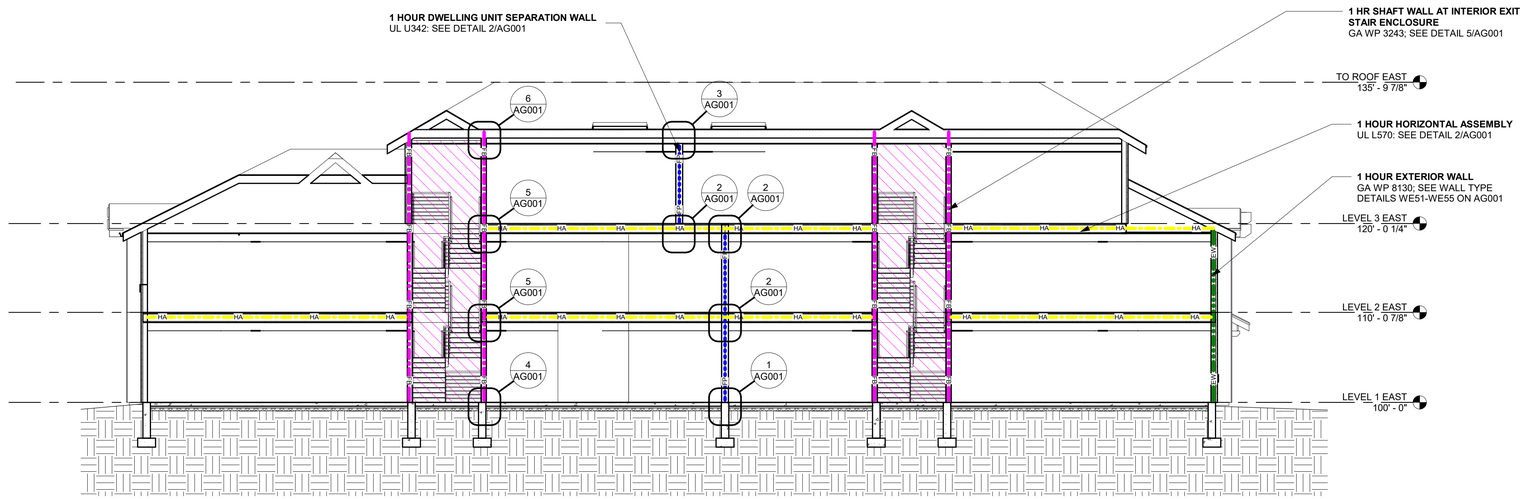
COPYRIGHT©



3 STAIR CORE SECTION - EAST BUILDING
1/8" = 1'-0"



1 EAST WEST CODE SECTION - EAST BUILDING
1/8" = 1'-0"



2 NORTH / SOUTH CODE SECTION - EAST BUILDING
1/8" = 1'-0"

CODE SYMBOL LEGEND

- FP — FIRE PARTITION - 1 HR
- EW — EXTERIOR WALL - 1 HR
- FB — FIRE BARRIER - 1 HR
- HA — HORIZONTAL ASSEMBLY - 1 HR
- 10' — SEGMENT LENGTH — EGRESS PATH
- COMMON PATH OF TRAVEL
- SHAFT ENCLOSURE - 1 HR
- ROOF BELOW
- 101 — ROOM NUMBER
- Name — UNIT TYPE
- 3200 SF — TABULATED AREA
- 100 — OCCUPANCY LOAD FACTOR
- 5 — NUMBER OF OCCUPANTS
- 32 — NUMBER OF OCCUPANTS SERVED AT EXIT COMPONENT

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

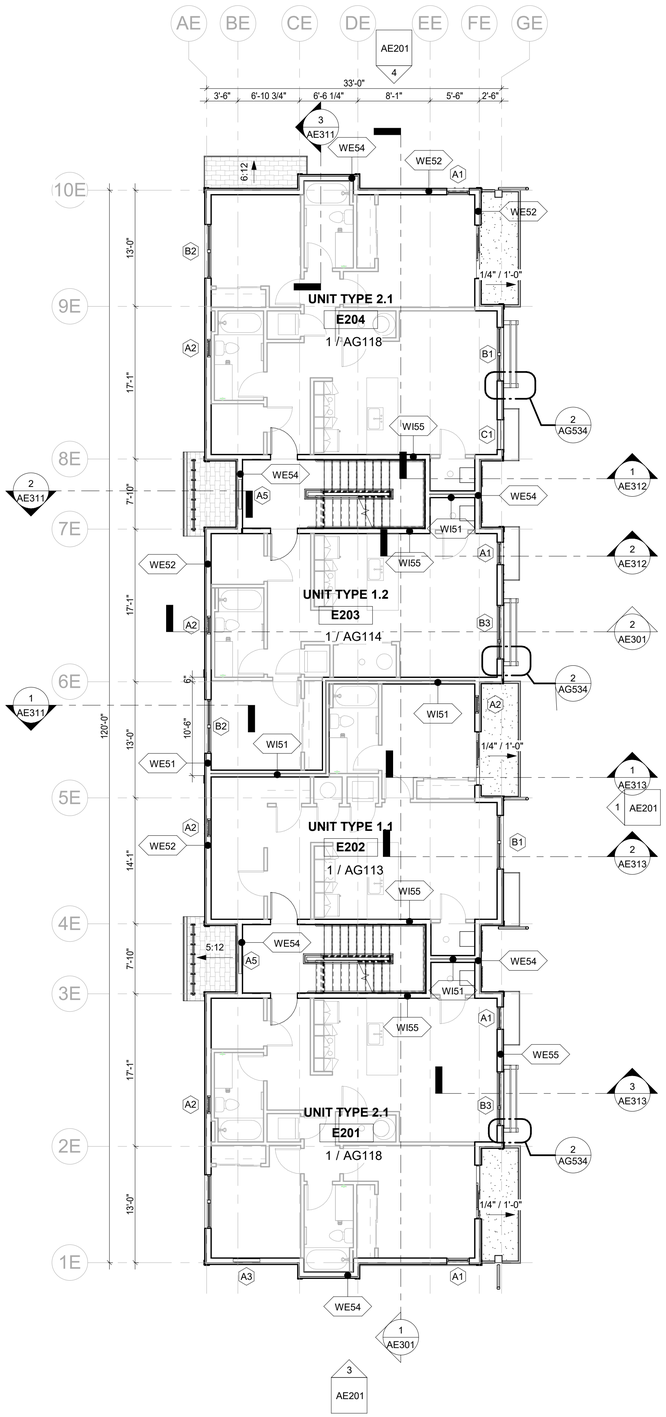
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

CODE SECTIONS - EAST BUILDING

AE004

PLOT DATE: 3/28/2022 3:01:44 PM

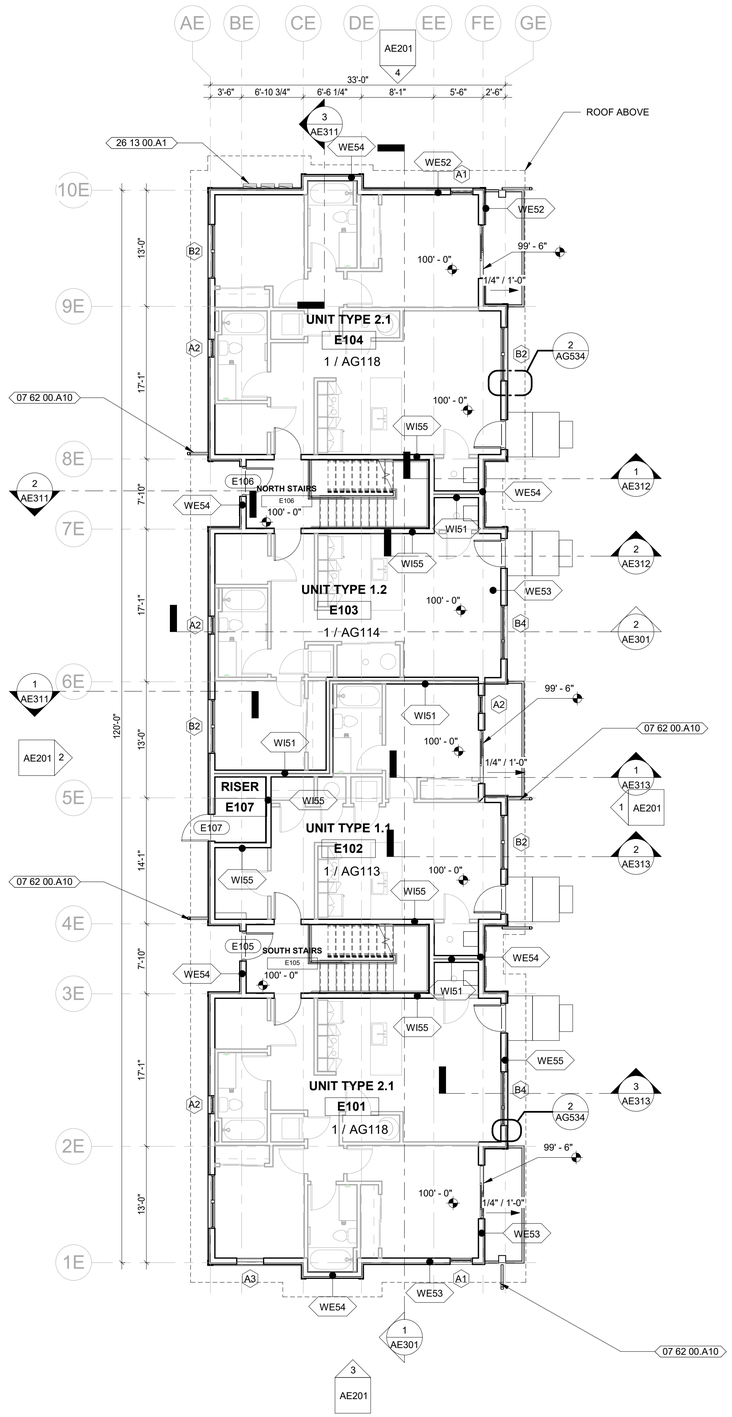
COPYRIGHT©



2 LEVEL 2 PLAN - EAST BUILDING
1/8" = 1'-0"

GRAPHIC SCALE
0 8 16 24 32

PLAN NORTH TRUE NORTH



1 LEVEL 1 PLAN - EAST BUILDING
1/8" = 1'-0"

GRAPHIC SCALE
0 8 16 24 32

PLAN NORTH TRUE NORTH

PLAN NOTES

1. ALL EXTERIOR DIMENSIONS ARE TO FACE OF STUD UNLESS NOTED OTHERWISE; FOF - FACE OF FINISH; CL - CENTERLINE ;FOS - FACE OF SHEATHING
2. ALL INTERIOR DIMENSIONS ARE TO FACE OF STUD UNLESS NOTED OTHERWISE; FOF - FACE OF FINISH; CL - CENTERLINE
3. TOP OF CONCRETE FLOOR (LEVEL ONE) IS DEFINED AS PROJECT EL. 100'-0" (ELEVATION 100'-0" EQUATES TO USGS DATUM ELEVATION OF 9043.5'.
4. WHERE DOORS IN WOOD STUD/GYPSUM BOARD PARTITIONS ARE NOT SPECIFICALLY LOCATED ON THE PLAN WITH DIMENSION STRINGS. PROVIDE A MINIMUM HINGE SIDE JAMB DIMENSION OF 4" FROM DOOR OPENING TO PERPENDICULAR WALLS. WHERE DOORS APPEAR TO BE CENTERED WITHIN CORRIDORS LOCATE THE DOORS IN THE CENTER OF THE CORRIDOR.
5. PROVIDE CONTINUOUS ACOUSTIC INSULATION AT ALL STUD WALLS COMMON TO FUTURE TENANT AREAS.
6. WHERE TWO DIFFERING PARTITION TYPES ABUT IN A LINE AND ALONG A CONTINUOUS LENGTH OF PARTITIONS, THE CONTINUOUS FINISHED SURFACES OF THESE PARTITIONS SHALL ALIGN UNLESS NOTED OTHERWISE.
7. IF FRAMING NEW NON-RATED PARTITIONS TO THE BOTTOM OF THE STRUCTURAL CEILING, AND THOSE PARTITIONS INTERSECT MECHANICAL EQUIPMENT, THEN FRAME AROUND THE MECHANICAL EQUIPMENT ALLOWING CLEARANCES FOR MAINTENANCE. DO NOT FRME TIGHT AGAINST ANY EQUIPMENT THAT MAY CAUSE VIBRATIONS IN THE PARTITION ASSEMBLY. PROVIDE 1/2" CLEARANCE FROM ALL DUCTWORK. NOTIFY ARCHITECT IF A RATED PARTITION INTERSECTS MECHANICAL EQUIPMENT.
8. THERE SHALL BE NO EXPOSED PIPE, DUCTS, ETC. ALL SUCH LINES SHALL BE CONCEALED OR FURRED, UNLESS NOTED AS EXPOSED CONSTRUCTION .
9. ALL INTERIOR PARTITIONS ARE TYPE WI52 UNLESS NOTED OTHERWISE. ALL EXTERIOR WALLS ARE TYPE WE51 UNLESS NOTED OTHERWISE. RATED WALLS ARE INDICATED ON THE CODE PLAN SHEETS. SEE SHEET G0.31 FOR PARTITION TYPES AND WIDTHS. WALL TYPES CONTINUE AROUND OUTSIDE CORNERS AND TERMINATE AT INSIDE CORNERS UNLESS INIDCATED OTHERWISE.
10. PROVIDE SLIP JOINT CONNECTIONS AT THE TOPS OF ALL PARTITIONS WHICH INTERSECT THE STRUCTURE ABOVE; PROVIDE FIRE SAFING AT ALL SLIP JOINT CONNECTIONS IN FIRE-RATED PARTITIONS SEE PARTITION TYPES FOR TYPICAL SLIP-JOINT CONNECTION DESIGN. IF AMOUNT OF DEFLECTION TO BE ACCOMODATED IS NOT INDICATED ON STRUCTURAL DRAWINGS, OBTAIN CLARIFICATION FROM ARCHITECT PRIOR TO PROCEEDING. .
11. WHERE MECHANICAL WORK PENETRATES ANY COMPONENT OF THE FIRE-RATED ASSEMBLY, PROVIDE THE APPROPRIATE FIRE AND/OR SMOKE DAMPERS.
12. DOOR ASSEMBLIES IN 1-HR RATED PARTITIONS ARE TO BE 20-MINUTE RATED UNLESS A HIGHER RATING IS INDICATED .
13. ALL WALLS ARE EITHER PARALLEL OR PERPENDICULAR UNLESS OTHERWISE NOTED. ALL ANGLED WALLS ARE MULTIPLES OF 45 DEGREES UNLESS NOTED OTHERWISE.
14. ALL OUTLETS SHOWN BACK-TO-BACK SHALL BE OFFSET A MINIMUM OF 6". A STUD SHALL SEPERATE OUTLETS IN ACOUSTIC PARTITIONS PROVIDE CEMENTITOUS BACKER UNITS AROUND ALL TILED SHOWER ENCLOSURES AND TUBS. PROVIDE WATER RESISTIVE GYPSUM BOARD AT TOILET ROOM WALLS. MAINTAIN REQUIRED FIRE RATING AT ALL PARTITIONS.
15. VERIFY EXACT LOCATION OF EQUIPMENT TO BE FURNISHED BY OTHERS PRIOR TO ROUGH-IN.

PLAN SYMBOLS AND HATCH LEGEND

1i	DOOR TAG
1t	WINDOW TAG
ROOM NAME 101	ROOM TAG
WE51	WALL TAG RE:ASSEMBLIES

KEYNOTES

KEY VALUE	KEYNOTE TEXT
07 62 00.A10	PREFINISHED METAL DOWNSPOUT WITH HEAT TRACE
26 13 00.A1	ELECTRICAL EQUIPMENT, RE: ELEC

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

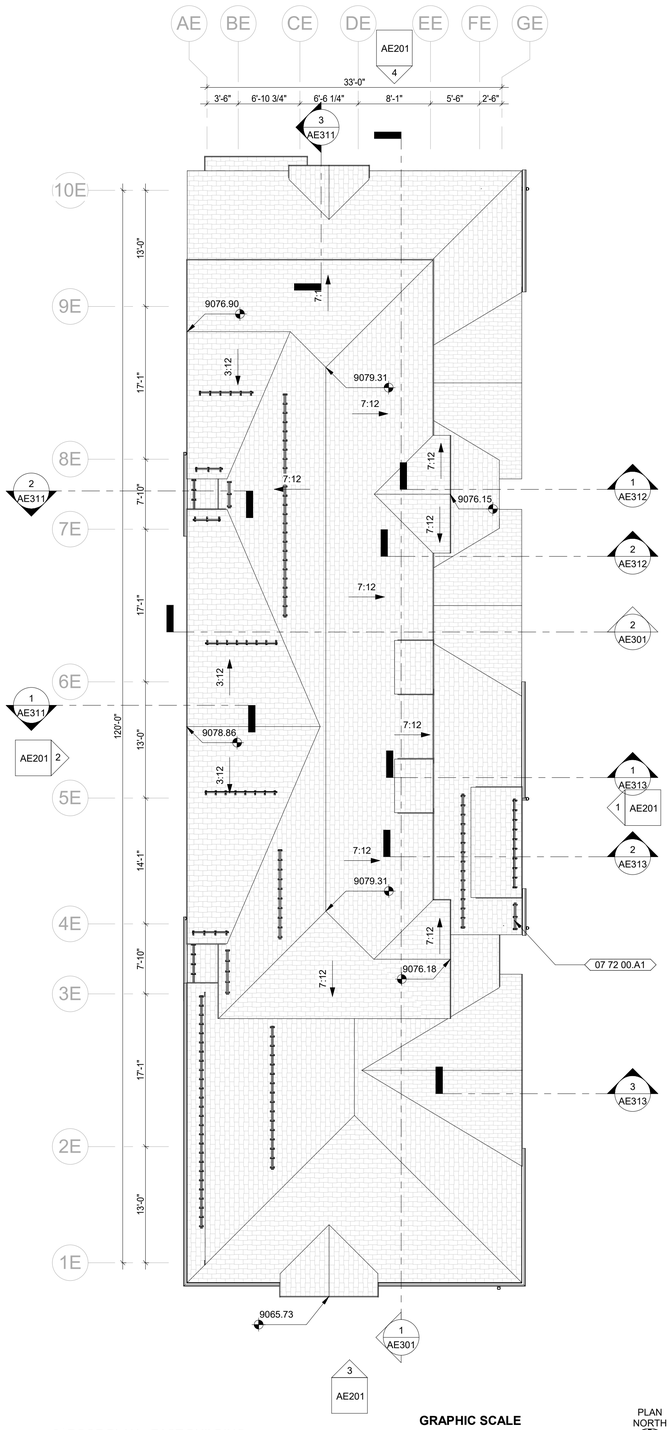
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

LEVEL 1 & 2 OVERALL FLOOR PLANS - EAST BUILDING

AE101

PLOT DATE: 3/28/2022 3:01:50 PM

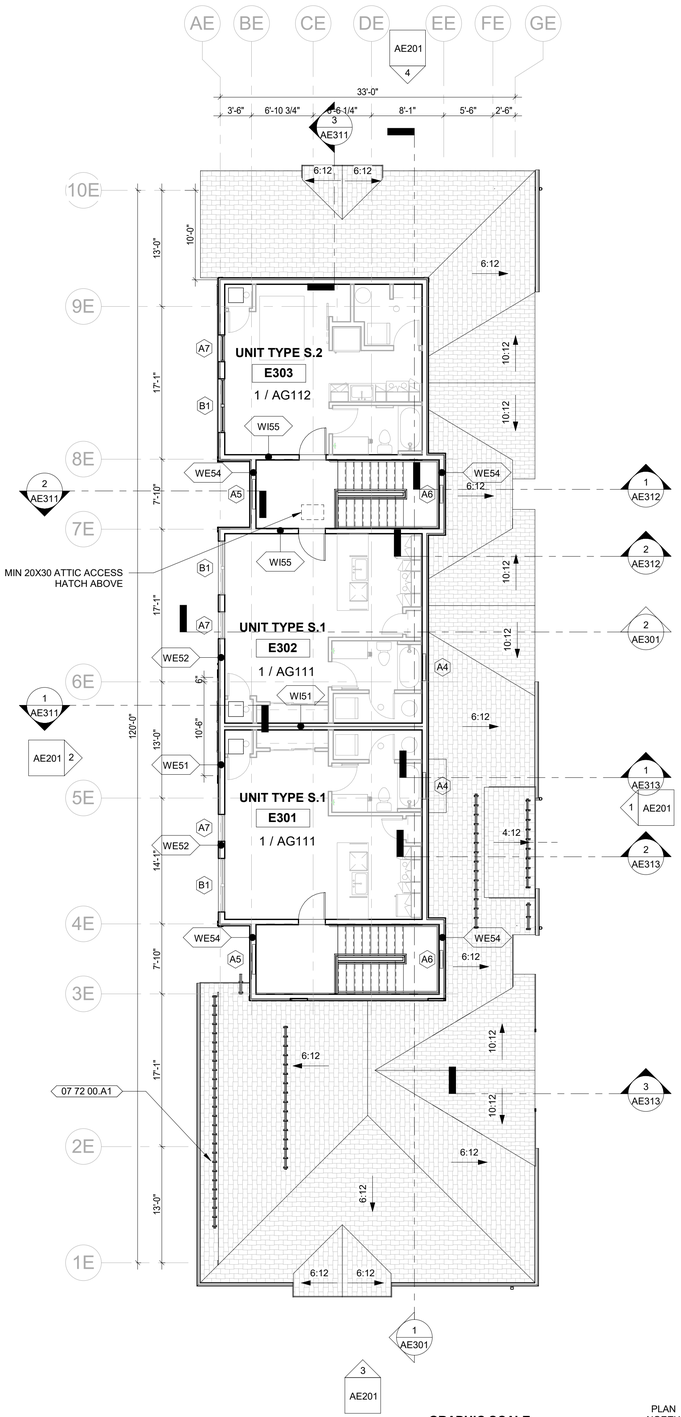
COPYRIGHT©



2 ROOF PLAN - EAST BUILDING
1/8" = 1'-0"

GRAPHIC SCALE
0 8 16 24 32

PLAN NORTH TRUE NORTH



1 LEVEL 3 PLAN - EAST BUILDING
1/8" = 1'-0"

GRAPHIC SCALE
0 8 16 24 32

PLAN NORTH TRUE NORTH

PLAN NOTES

1. ALL EXTERIOR DIMENSIONS ARE TO FACE OF STUD UNLESS NOTED OTHERWISE; FOF - FACE OF FINISH; CL - CENTERLINE ;FOS - FACE OF SHEATHING
2. ALL INTERIOR DIMENSIONS ARE TO FACE OF STUD UNLESS NOTED OTHERWISE; FOF - FACE OF FINISH; CL - CENTERLINE
3. TOP OF CONCRETE FLOOR (LEVEL ONE) IS DEFINED AS PROJECT EL. 100'-0" (ELEVATION 100'-0" EQUATES TO USGS DATUM ELEVATION OF 9043.5'.
4. WHERE DOORS IN WOOD STUD/GYPSUM BOARD PARTITIONS ARE NOT SPECIFICALLY LOCATED ON THE PLAN WITH DIMENSION STRINGS. PROVIDE A MINIMUM HINGE SIDE JAMB DIMENSION OF 4" FROM DOOR OPENING TO PERPENDICULAR WALLS. WHERE DOORS APPEAR TO BE CENTERED WITHIN CORRIDORS LOCATE THE DOORS IN THE CENTER OF THE CORRIDOR.
5. PROVIDE CONTINUOUS ACOUSTIC INSULATION AT ALL STUD WALLS COMMON TO FUTURE TENANT AREAS.
6. WHERE TWO DIFFERING PARTITION TYPES ABUT IN A LINE AND ALONG A CONTINUOUS LENGTH OF PARTITIONS, THE CONTINUOUS FINISHED SURFACES OF THESE PARTITIONS SHALL ALIGN UNLESS NOTED OTHERWISE.
7. IF FRAMING NEW NON-RATED PARTITIONS TO THE BOTTOM OF THE STRUCTURAL CEILING, AND THOSE PARTITIONS INTERSECT MECHANICAL EQUIPMENT, THEN FRAME AROUND THE MECHANICAL EQUIPMENT ALLOWING CLEARANCES FOR MAINTENANCE. DO NOT FRME TIGHT AGAINST ANY EQUIPMENT THAT MAY CAUSE VIBRATIONS IN THE PARTITION ASSEMBLY. PROVIDE 1/2" CLEARANCE FROM ALL DUCTWORK. NOTIFY ARCHITECT IF A RATED PARTITION INTERSECTS MECHANICAL EQUIPMENT.
8. THERE SHALL BE NO EXPOSED PIPE, DUCTS, ETC. ALL SUCH LINES SHALL BE CONCEALED OR FURRED, UNLESS NOTED AS EXPOSED CONSTRUCTION .
9. ALL INTERIOR PARTITIONS ARE TYPE WI52 UNLESS NOTED OTHERWISE. ALL EXTERIOR WALLS ARE TYPE WE51 UNLESS NOTED OTHERWISE. RATED WALLS ARE INDICATED ON THE CODE PLAN SHEETS. SEE SHEET G0.31 FOR PARTITION TYPES AND WIDTHS. WALL TYPES CONTINUE AROUND OUTSIDE CORNERS AND TERMINATE AT INSIDE CORNERS UNLESS INIDCATED OTHERWISE.
10. PROVIDE SLIP JOINT CONNECTIONS AT THE TOPS OF ALL PARTITIONS WHICH INTERSECT THE STRUCTURE ABOVE; PROVIDE FIRE SAFING AT ALL SLIP JOINT CONNECTIONS IN FIRE-RATED PARTITIONS SEE PARTITION TYPES FOR TYPICAL SLIP-JOINT CONNECTION DESIGN. IF AMOUNT OF DEFLECTION TO BE ACCOMODATED IS NOT INDICATED ON STRUCTURAL DRAWINGS, OBTAIN CLARIFICATION FROM ARCHITECT PRIOR TO PROCEEDING. .
11. WHERE MECHANICAL WORK PENETRATES ANY COMPONENT OF THE FIRE-RATED ASSEMBLY, PROVIDE THE APPROPRIATE FIRE AND/OR SMOKE DAMPERS.
12. DOOR ASSEMBLIES IN 1-HR RATED PARTITIONS ARE TO BE 20-MINUTE RATED UNLESS A HIGHER RATING IS INDICATED .
13. ALL WALLS ARE EITHER PARALLEL OR PERPENDICULAR UNLESS OTHERWISE NOTED. ALL ANGLED WALLS ARE MULTIPLES OF 45 DEGREES UNLESS NOTED OTHERWISE.
14. ALL OUTLETS SHOWN BACK-TO-BACK SHALL BE OFFSET A MINIMUM OF 6". A STUD SHALL SEPERATE OUTLETS IN ACOUSTIC PARTITIONS PROVIDE CEMENTITOUS BACKER UNITS AROUND ALL TILED SHOWER ENCLOSURES AND TUBS. PROVIDE WATER RESISTIVE GYPSUM BOARD AT TOILET ROOM WALLS. MAINTAIN REQUIRED FIRE RATING AT ALL PARTITIONS.
15. VERIFY EXACT LOCATION OF EQUIPMENT TO BE FURNISHED BY OTHERS PRIOR TO ROUGH-IN.

ROOF PLAN NOTES

A. DETAILED FLOOR AND ROOF TRUSS FRAMING DIAGRAMS ARE TO BE FURNISHED BY A STRUCTURAL ENGINEER LICENSED IN THE STATE WHERE THE PROJECT IS TO BE LOCATED.
B. THE TRUSS MANUFACTURER SHALL PROVIDE ENGINEERED PERMANENT ROOF TRUSS BRACING AS REQUIRED BY THE CODE.
C. LOCATE HIGH-POINT OF GUTTER AT MID-SPAN IN BETWEEN DOWNSPOUTS UNLESS INDICATED OTHERWISE ON THE ROOF PLAN.
D. DOWNSPOUTS TO DISCHARGE TO STORM DRAIN, RE: CIVIL
E. FRAMING SUB-CONTRACTOR AND PANEL MANUFACTURER TO REVIEW BUILDING SECTIONS TO ACCOMMODATE RATED WALL ASSEMBLIES. EXTEND ALL RATED PARTITIONS BETWEEN UNITS TO BOTTOM OF OUTER MOST ROOF PLANE, THROUGH SOFFITS, AND OVER-BUILD TO CREATE A CONTINUOUS PARTITION.
F. THE ENTIRE BUILDING ENVELOPE INCLUDING ROOF, WALLS, & FLOORS TO BE DRIED IN PRIOR TO THE STORAGE AND INSTALLATION OF INTERIOR FINISH MATERIALS. IN ADDITION, THE OWNER'S REPRESENTATIVE IS RESPONSIBLE FOR VERIFYING THAT THERE HAS BEEN NO EVIDENCE OF WATER PENETRATING THE BUILDING ENVELOPE OR WATER LEAK FROM MECHANICAL AND/OR FIRE SPRINKLER SYSTEMS PRIOR TO ENCLOSING THE WALL, CEILING OR ROOF CAVITIES.
G. PROVIDE ICE & WATER SHIELD AROUND ALL PENETRATIONS.
H. TRUSS MANUFACTURER TO COORDINATE ROOF TRUSSES WITH ARCH. TO INCLUDE SUFFICIENT HEEL HEIGHT TO ACCOMMODATE FULL DEPTH OF REQUIRED INSULATION.
I. PROVIDE (2) LAYERS OF ICE AND WATER SHIELD OVER ALL ROOFS
J. ROOF COVERING TO BE A MINIMUM CLASS B
K. PROVIDE HEAT TRACE AT ALL GUTTERS, DOWNSPOUTS, AND ABOVE ALL ROOF SOFFITS TO A MINIMUM OF 6" PAST THE WALL BELOW

PLAN SYMBOLS AND HATCH LEGEND

1i — DOOR TAG

1t — WINDOW TAG

ROOM NAME
101 — ROOM TAG

WE51 — WALL TAG RE:ASSEMBLIES

KEYNOTES

KEY VALUE	KEYNOTE TEXT
07 72 00.A1	POWDER COATED DECK-MOUNTED SNOW FENCE SYSTEM, DESIGNED BY OTHERS

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

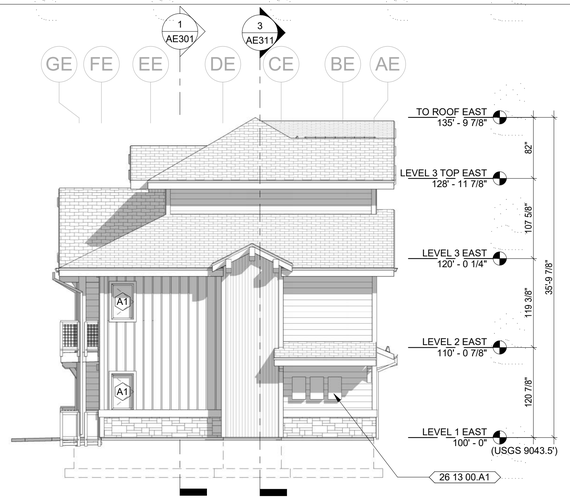
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

LEVEL 3 & ROOF OVERALL PLANS - EAST BUILDING

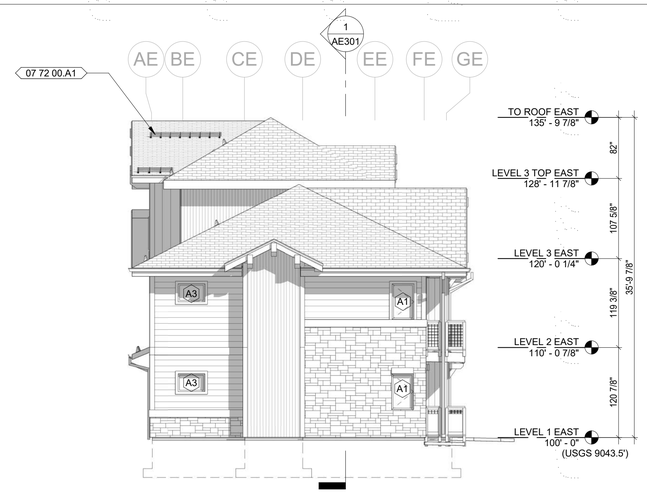
AE102

PLOT DATE: 3/28/2022 3:01:54 PM

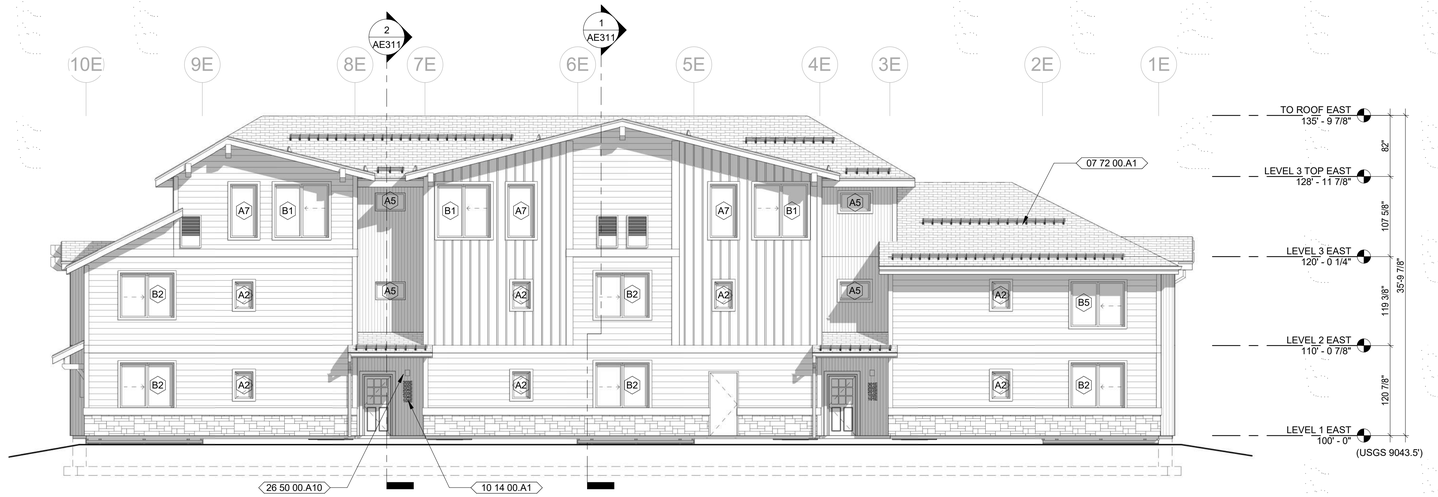
COPYRIGHT©



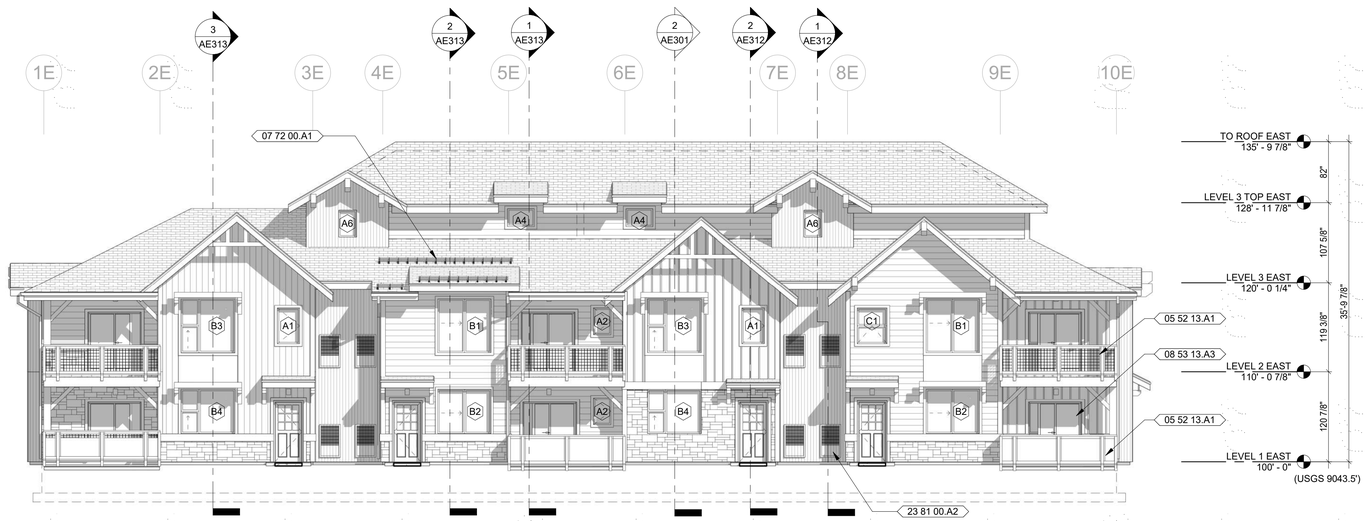
4 NORTH ELEVATION - EAST BUILDING
1/8" = 1'-0"



3 SOUTH ELEVATION - EAST BUILDING
1/8" = 1'-0"



2 WEST ELEVATION - EAST BUILDING
1/8" = 1'-0"



1 EAST ELEVATION - EAST BUILDING
1/8" = 1'-0"

ELEVATION LEGEND

- BOARD AND BATTEN SIDING
- VERTICAL WOOD SIDING
- HORIZONTAL LAP SIDING
- VERTICAL CORRUGATED METAL
- ASPHALT SHINGLES
- STONE VENEER

KEYNOTES

KEY VALUE	KEYNOTE TEXT
05 52 13.A1	PAINTED WOOD RAILING WITH POWDER COATED WELDED-WIRE MESH RAILING PANELS
07 72 00.A1	POWDER COATED DECK-MOUNTED SNOW FENCE SYSTEM, DESIGNED BY OTHERS
08 53 13.A3	SLIDING VINYL PATIO DOOR
10 14 00.A1	POWDER COATED METAL UNIT NUMBERS, REFLECTIVE
23 81 00.A2	VTAC UNIT, RE: MECH
26 13 00.A1	ELECTRICAL EQUIPMENT, RE: ELEC
26 50 00.A10	EXTERIOR LIGHT SCONCE, RE: ELEC

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

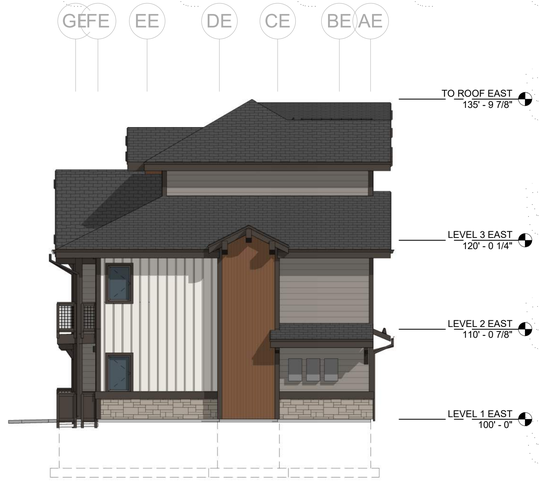
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

BUILDING ELEVATIONS - EAST BUILDING

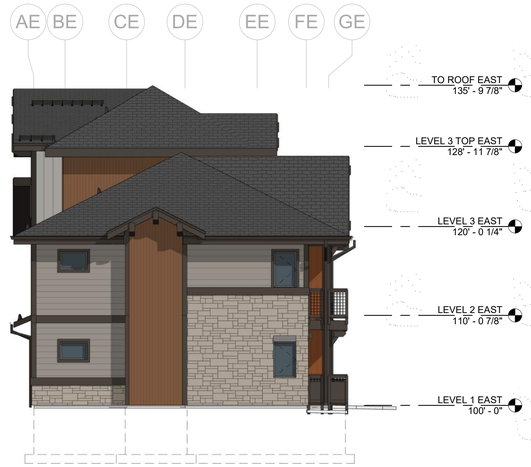
AE201

PLOT DATE: 3/28/2022 3:02:21 PM

COPYRIGHT©



4 NORTH ELEVATION - COLOR - EAST BUILDING
1/8" = 1'-0"



3 SOUTH ELEVATION - COLOR - EAST BUILDING
1/8" = 1'-0"

2 WEST ELEVATION - COLOR - EAST BUILDING
1/8" = 1'-0"

1 EAST ELEVATION - COLOR - EAST BUILDING
1/8" = 1'-0"

ELEVATION LEGEND

- BOARD AND BATTEN SIDING
- VERTICAL WOOD SIDING
- HORIZONTAL LAP SIDING
- VERTICAL CORRUGATED METAL
- ASPHALT SHINGLES
- STONE VENEER

EXTERIOR COLORS - EAST

- ROOFING - CHARCOAL
- COLOR 1 - SHERWIN WILLIAMS "GAUNTLET GRAY"
- COLOR 2 - SHERWIN WILLIAMS "EIDER WHITE"
- COLOR 3 - SHERWIN WILLIAMS "SEALSKIN"
- COLOR 4 - SHERWIN WILLIAMS "RED BARN"
- VERTICAL WOOD SIDING - MATTE FINISH
- VERTICAL CORRUGATED METAL
- STONE ELDORADO CLIFFSTONE "WHITEBARK"

KEYNOTES

KEY VALUE	KEYNOTE TEXT

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

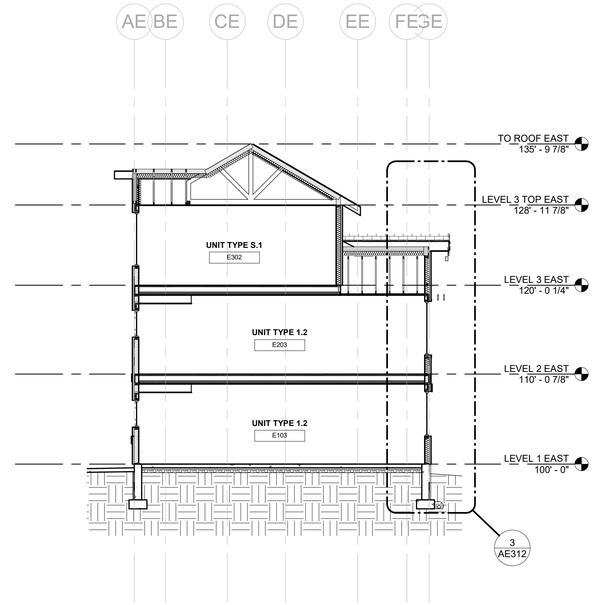
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

COLORED ELEVATIONS - EAST BUILDING

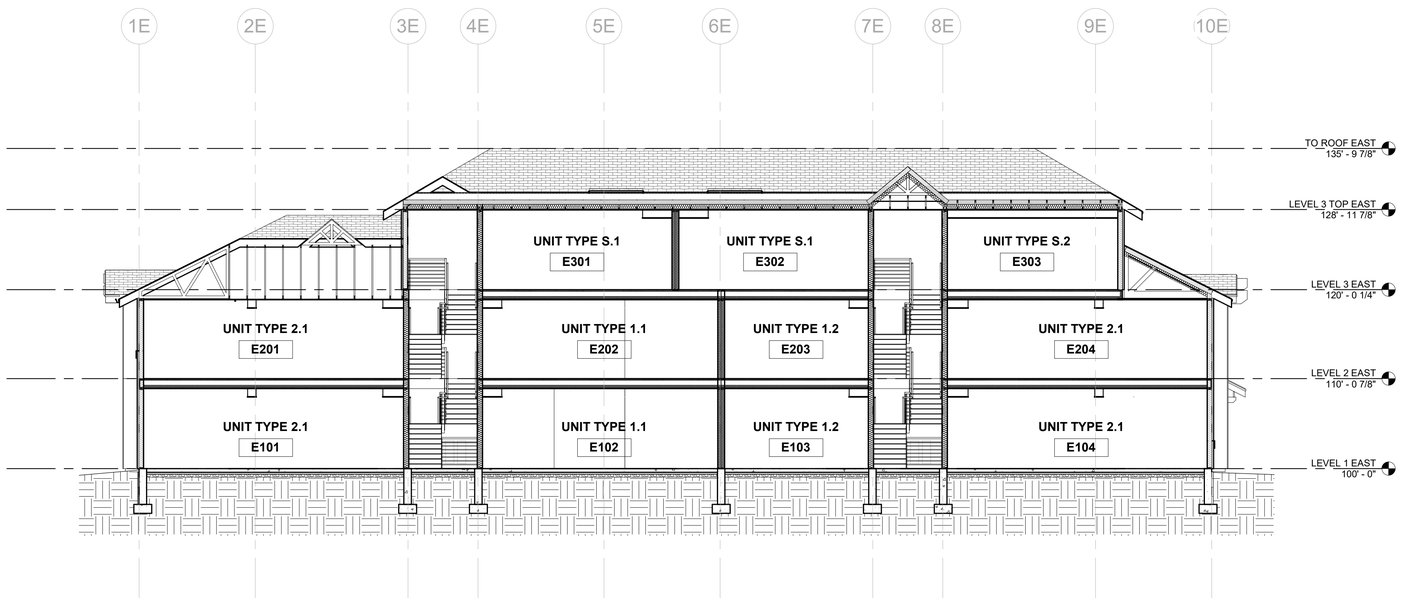
AE211

COPYRIGHT©

PLOT DATE: 3/28/2022 3:02:35 PM



2 TRANSVERSE BUILDING SECTION - EAST BUILDING
1/8" = 1'-0"



1 LONGITUDINAL BUILDING SECTION - EAST BUILDING
1/8" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

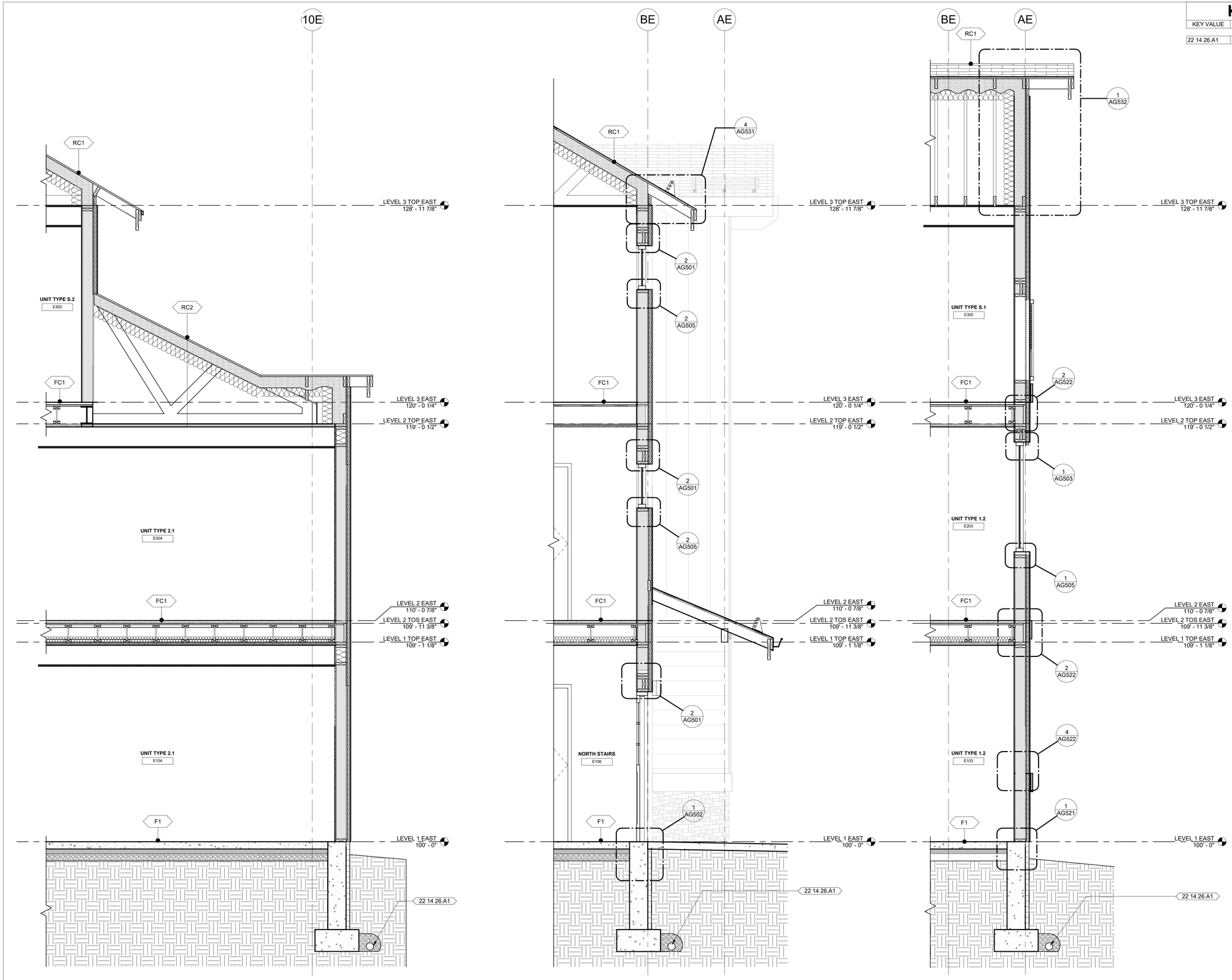
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

BUILDING SECTIONS - EAST BUILDING

AE301

PLOT DATE: 3/28/2022 3:02:37 PM

COPYRIGHT©



3 WALL SECTION 9 - EAST BUILDING
1/2" = 1'-0"

2 WALL SECTION 8 - EAST BUILDING
1/2" = 1'-0"

1 WALL SECTION 7 - EAST BUILDING
1/2" = 1'-0"

KEYNOTES

KEY VALUE	KEYNOTE TEXT
22 14 26.A1	STORM DRAIN, RE: CIVIL

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

WALL SECTIONS - EAST BUILDING

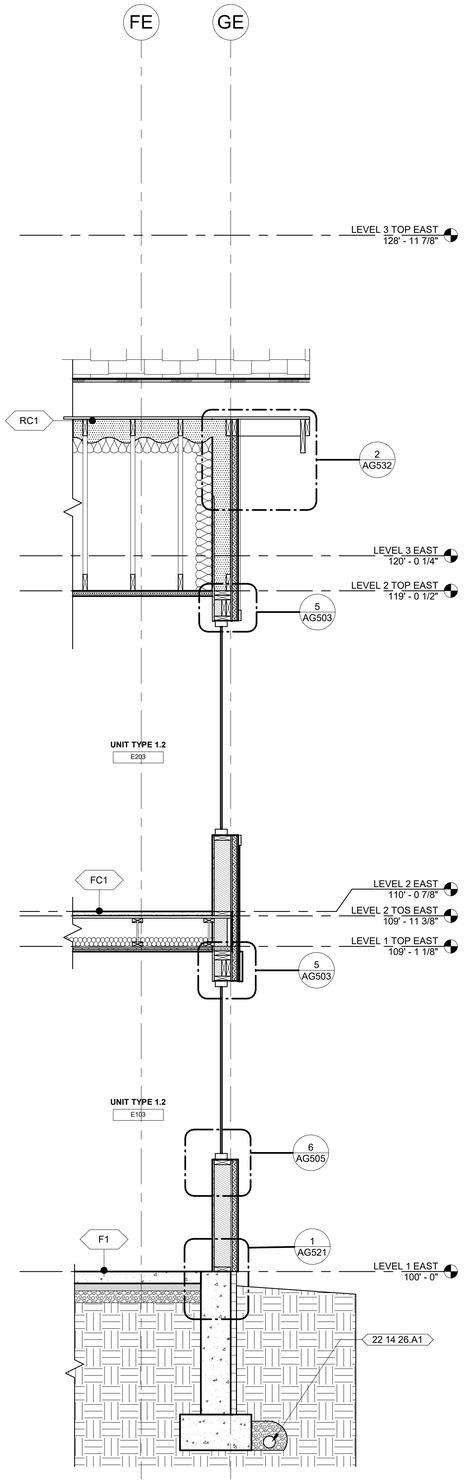
AE311

PLOT DATE: 3/28/2022 3:02:49 PM

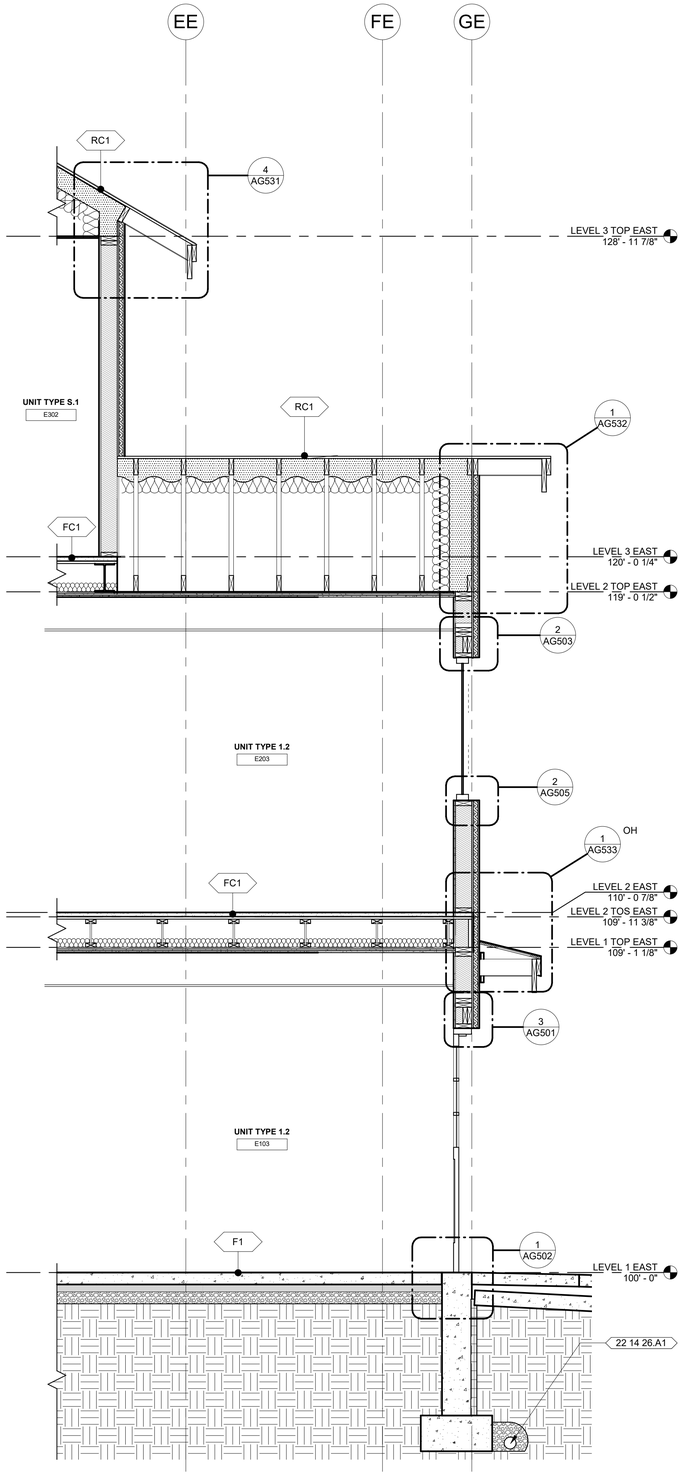
COPYRIGHT©

KEYNOTES

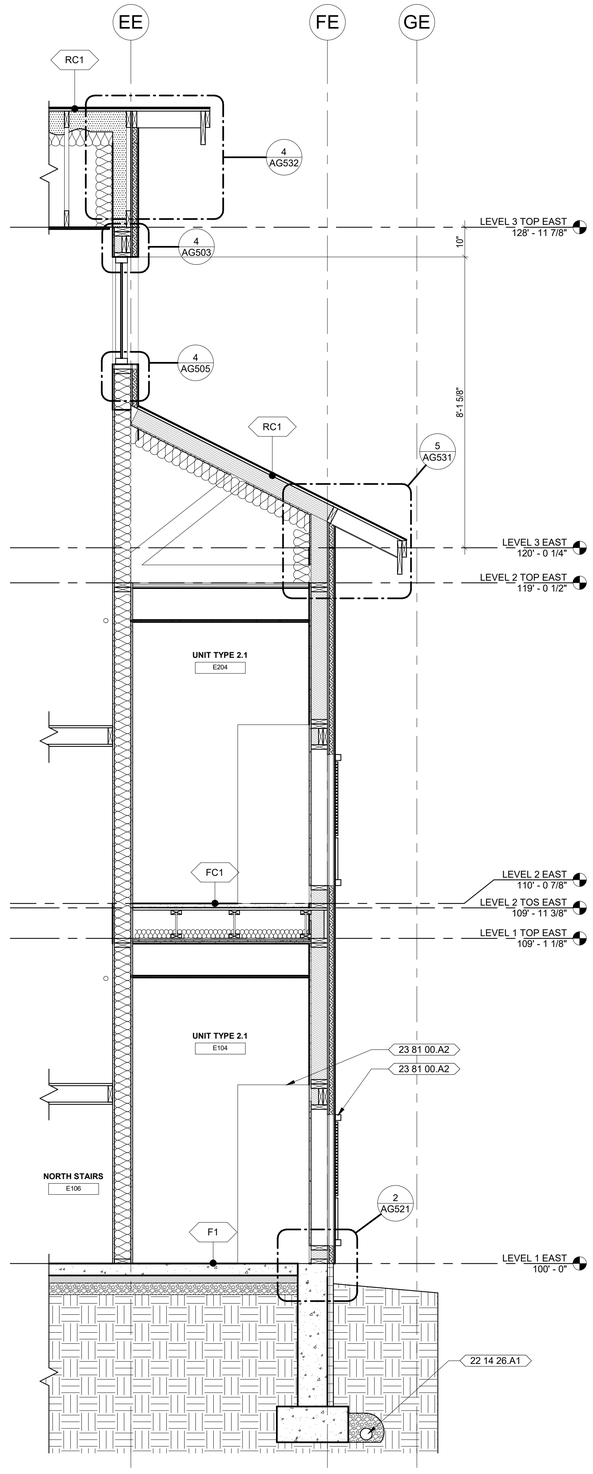
KEY VALUE	KEYNOTE TEXT
22 14 26.A1	STORM DRAIN, RE: CIVIL
23 81 00.A2	VTAC UNIT, RE: MECH



3 WALL SECTION 3 - EAST BUILDING
1/2" = 1'-0"



2 WALL SECTION 2 - EAST BUILDING
1/2" = 1'-0"



1 WALL SECTION 1 - EAST BUILDING
1/2" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

WALL SECTIONS - EAST BUILDING

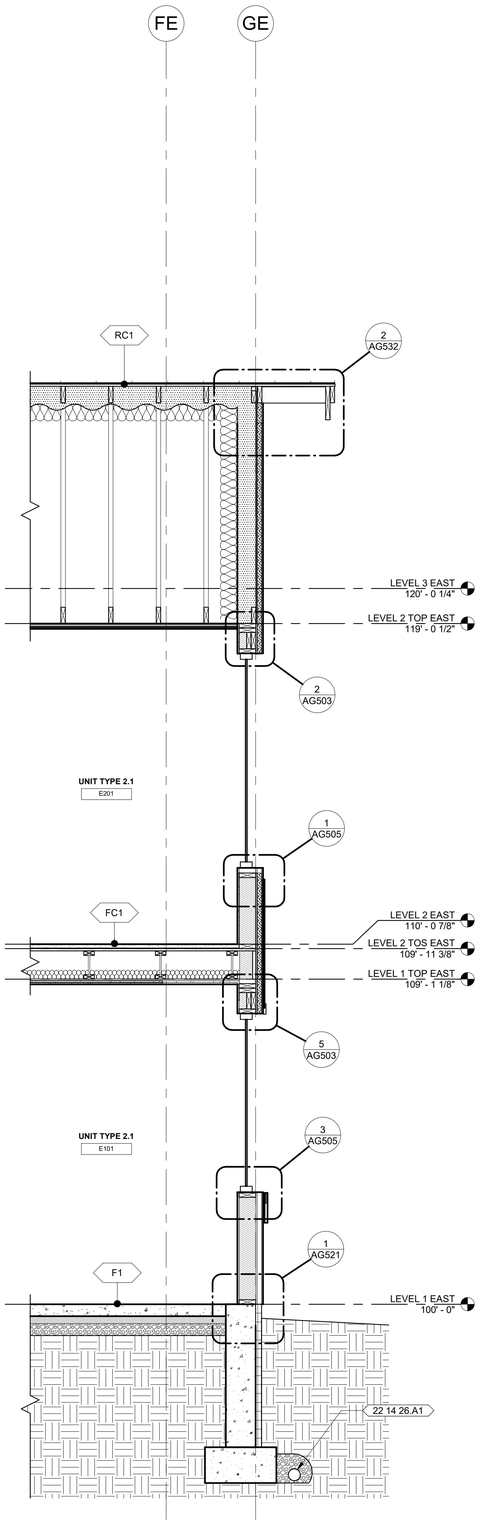
AE312

PLOT DATE: 3/28/2022 3:02:43 PM

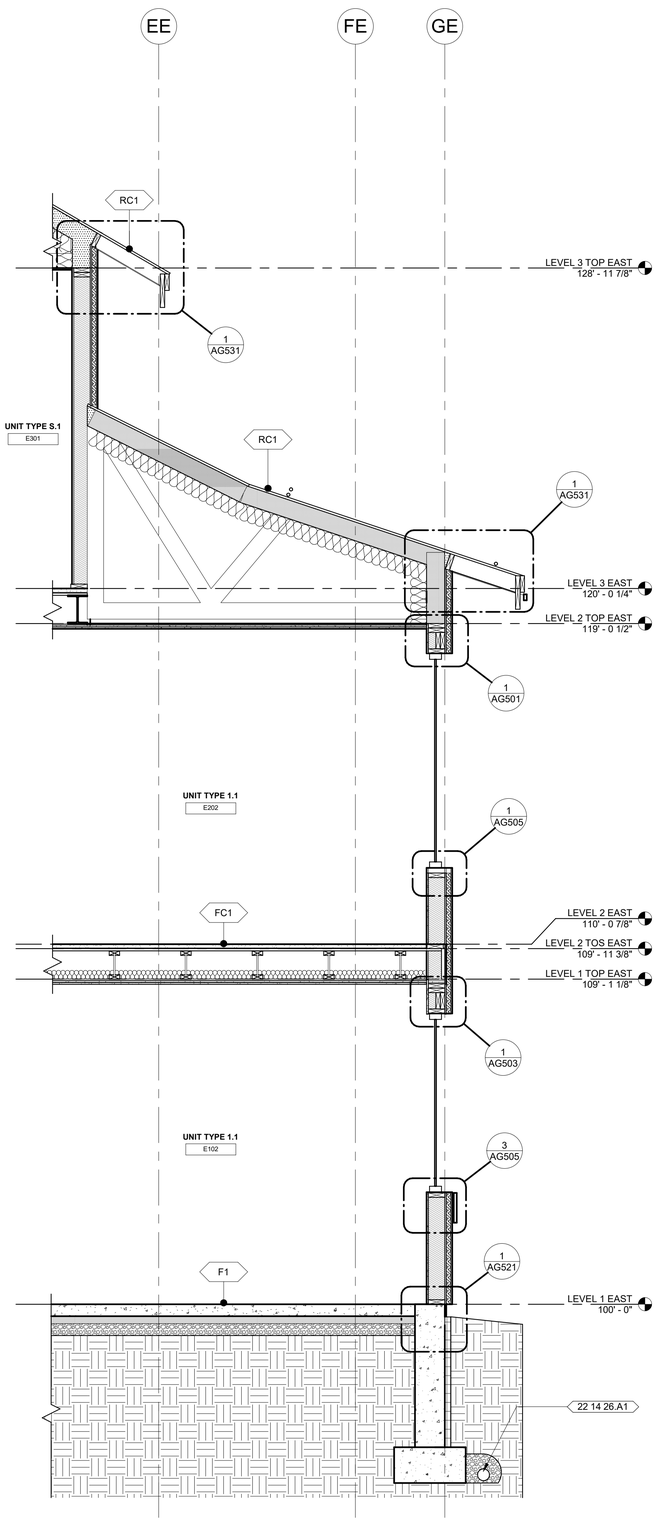
COPYRIGHT©

KEYNOTES

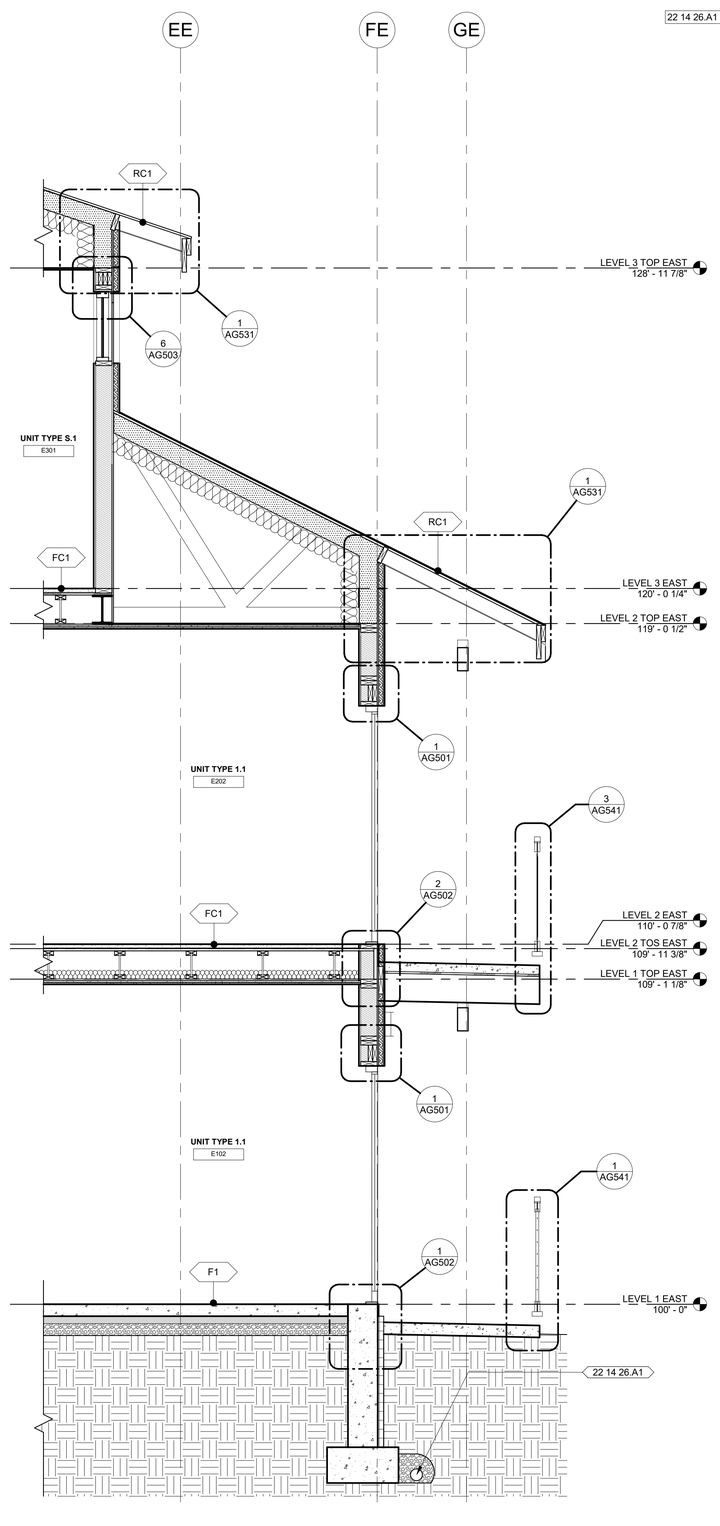
KEY VALUE	KEYNOTE TEXT
22 14 26.A1	STORM DRAIN, RE: CIVIL



3 WALL SECTION 6 - EAST BUILDING
1/2" = 1'-0"



2 WALL SECTION 5 - EAST BUILDING
1/2" = 1'-0"



1 WALL SECTION 4 - EAST BUILDING
1/2" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions will be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

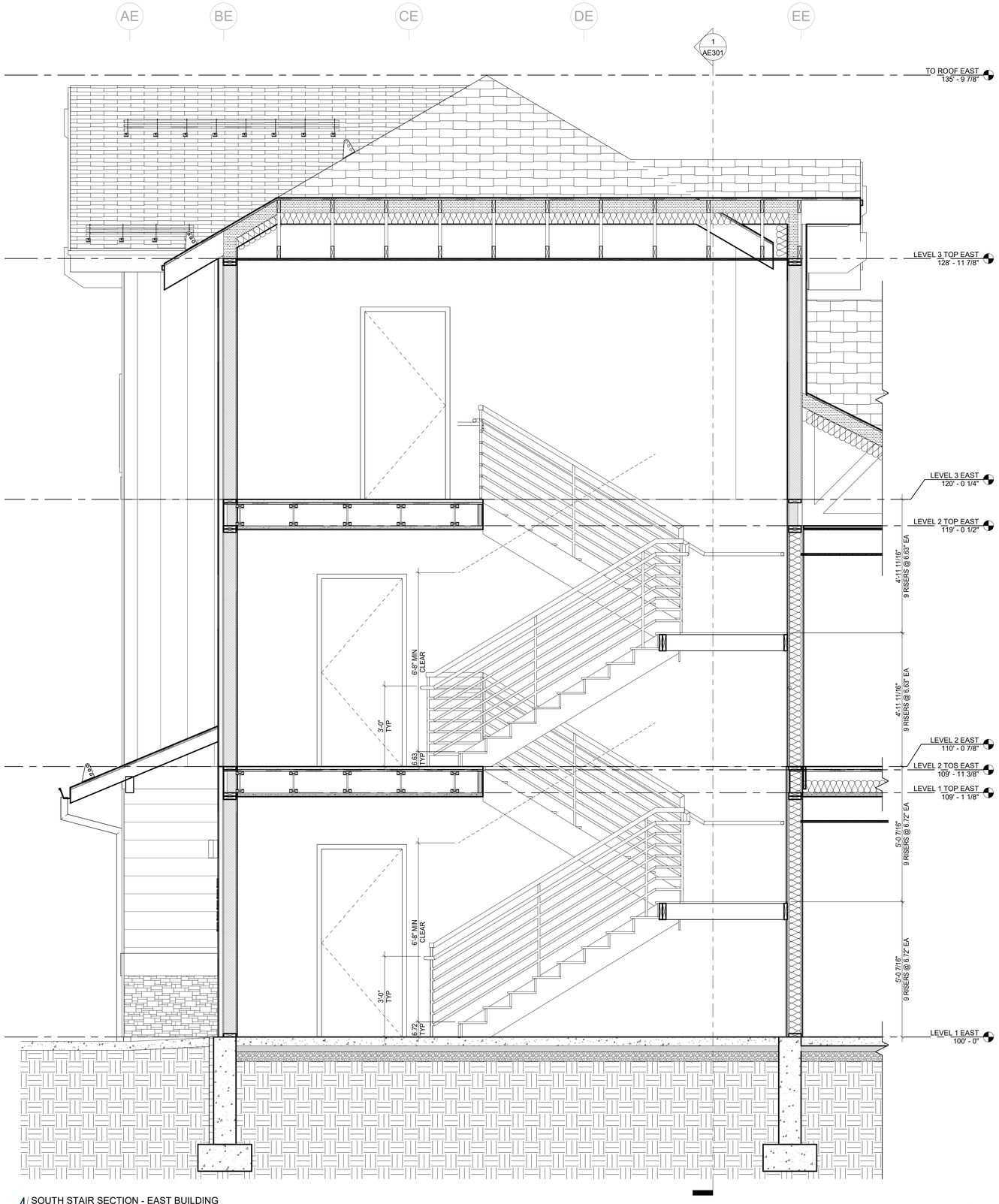
WALL SECTIONS - EAST BUILDING

AE313

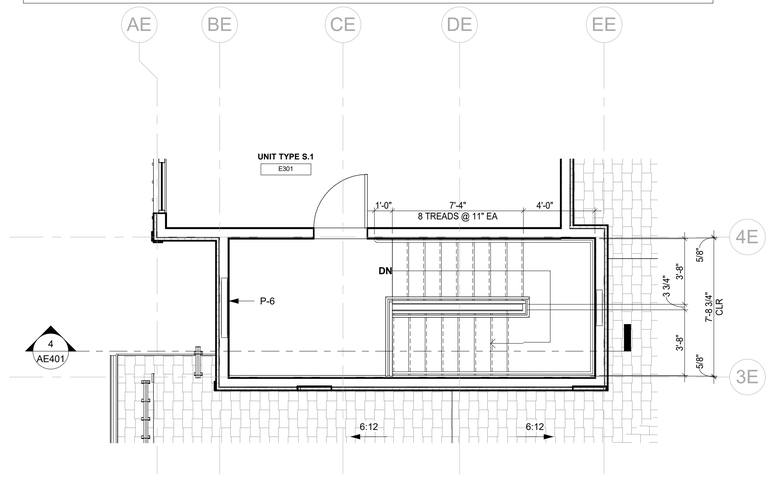
PLOT DATE: 3/28/2022 3:02:48 PM

COPYRIGHT©

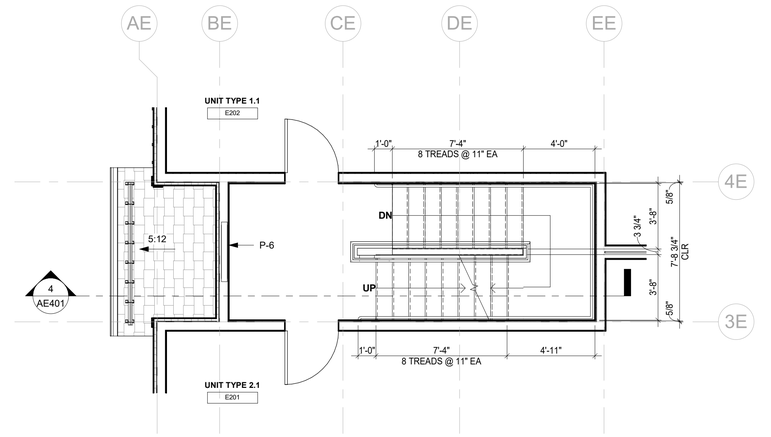
GENERAL NOTE: SEE FINISH SCHEDULE FOR FINISHES IN STAIRS, RE AG603.



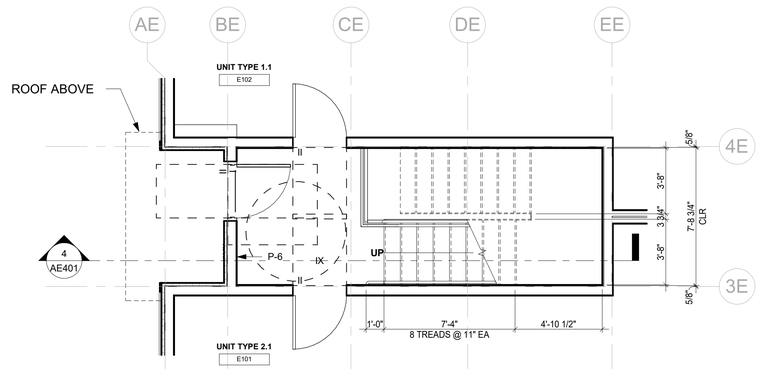
4 SOUTH STAIR SECTION - EAST BUILDING
1/2" = 1'-0"



3 LEVEL 3 SOUTH STAIR PLAN - EAST BUILDING
1/4" = 1'-0"



2 LEVEL 2 SOUTH STAIR PLAN - EAST BUILDING
1/4" = 1'-0"



1 LEVEL 1 SOUTH STAIR PLAN - EAST BUILDING
1/4" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

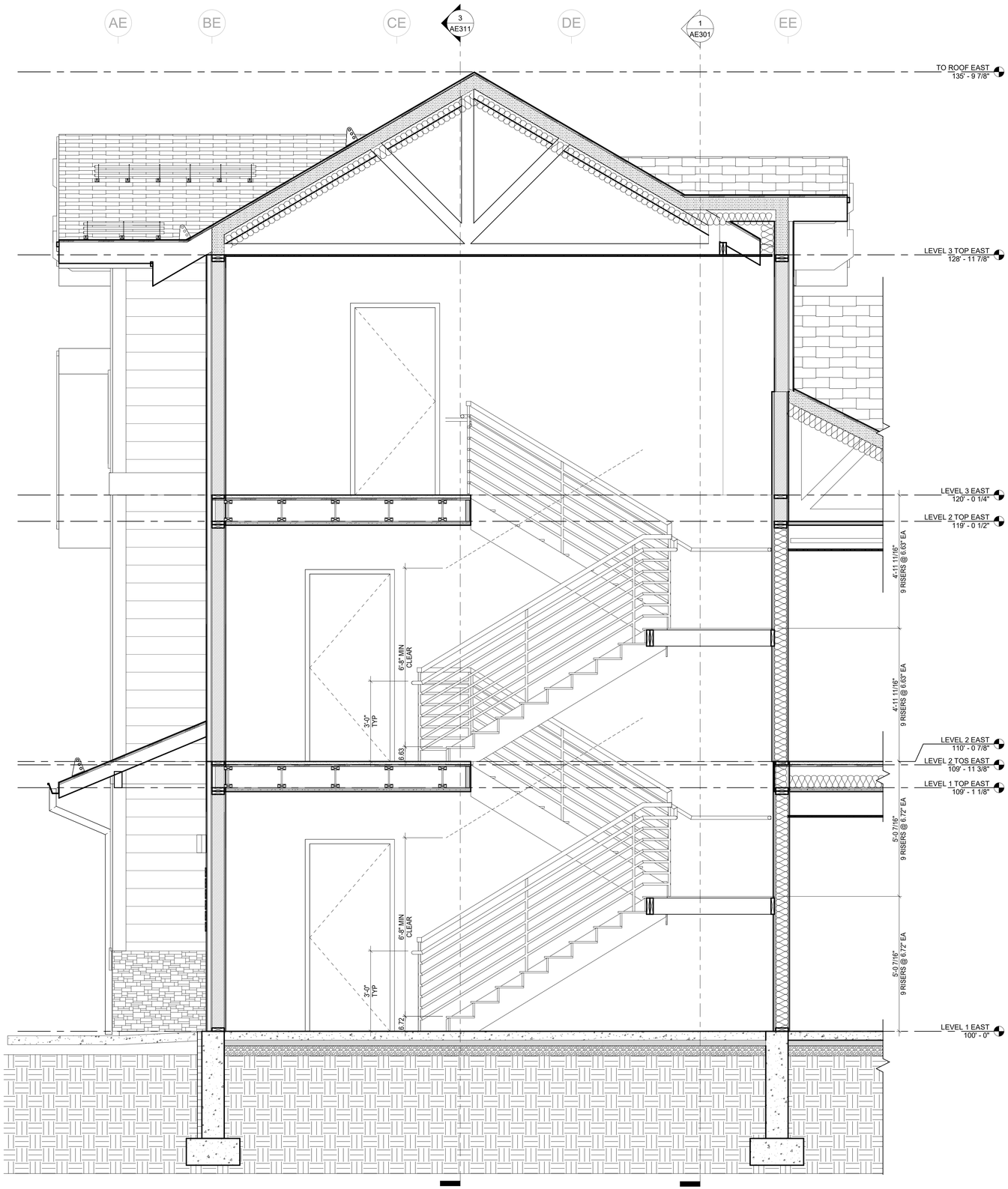
SOUTH STAIR - EAST BUILDING

AE401

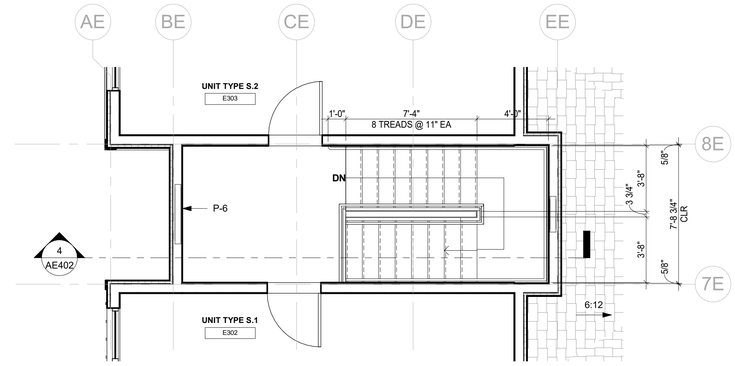
PLOT DATE: 3/28/2022 3:02:48 PM

COPYRIGHT©

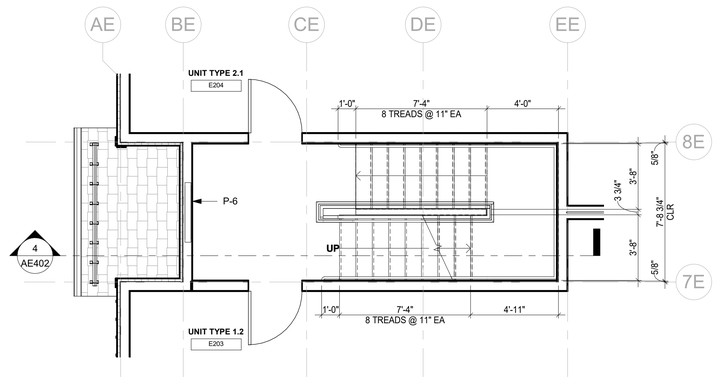
GENERAL NOTE: SEE FINISH SCHEDULE FOR FINISHES IN STAIRS, RE AG603.



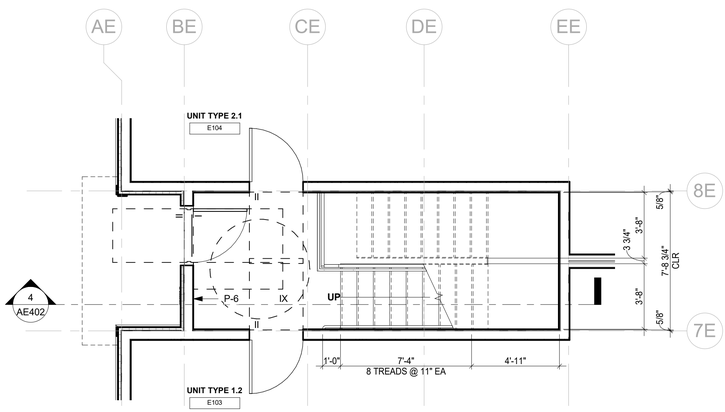
4 NORTH STAIR SECTION - EAST BUILDING
1/2" = 1'-0"



3 LEVEL 3 NORTH STAIR PLAN - EAST BUILDING
1/4" = 1'-0"



2 LEVEL 2 NORTH STAIR PLAN - EAST BUILDING
1/4" = 1'-0"



1 LEVEL 1 NORTH STAIR PLAN - EAST BUILDING
1/4" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

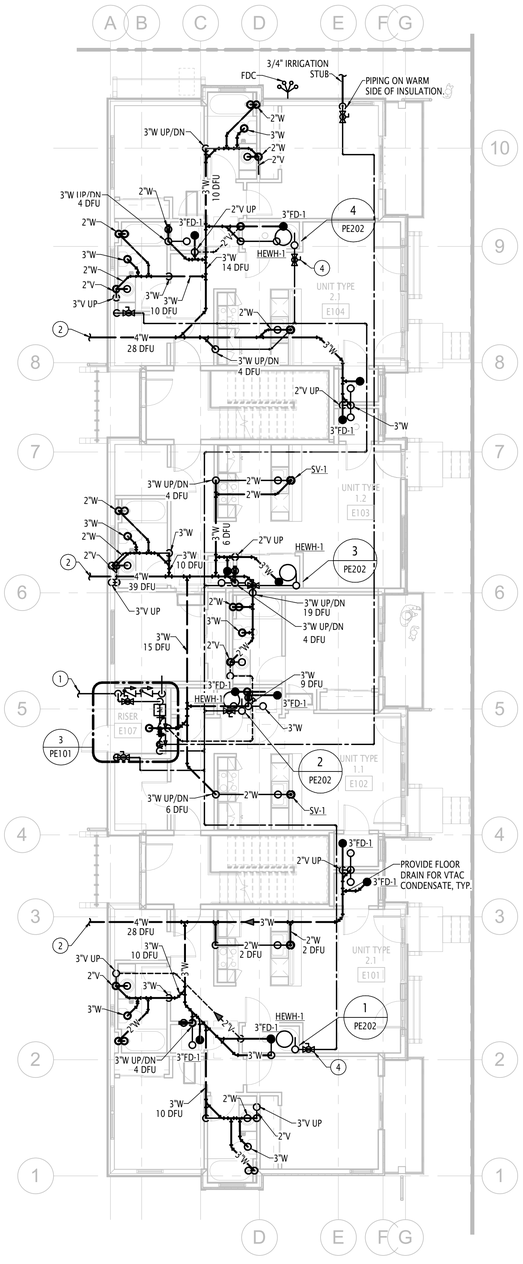
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

NORTH STAIR - EAST BUILDING

AE402

PLOT DATE: 3/28/2022 3:02:51 PM

COPYRIGHT©

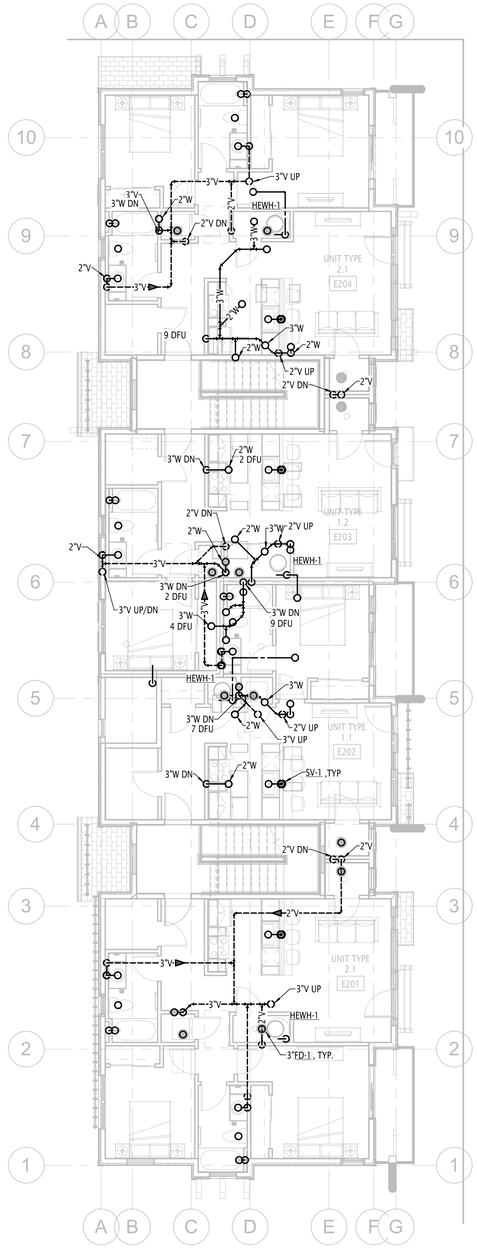


1 FIRST FLOOR PLUMBING PLAN EAST

SCALE: 1/8" = 1'-0"

0' 4' 8' 16' 32'

N

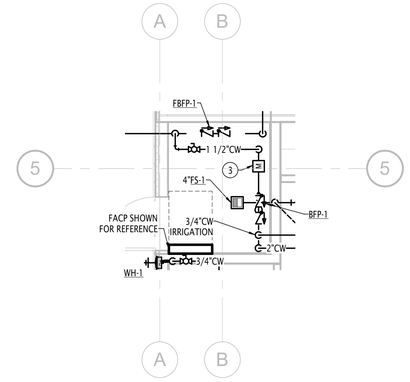


2 SECOND FLOOR PLUMBING PLAN EAST

SCALE: 1/8" = 1'-0"

0' 4' 8' 16' 32'

N



3 ENLARGED WATER ENTRY PLUMBING PLAN

SCALE: 1/4" = 1'-0"

0' 4' 8' 16' 32'

X PLUMBING DETAIL NOTES

1. 4" COMBINATION FIRE/WATER SERVICE 5'-0" FROM BUILDING FACE. MINIMUM INVERT 5'-0" BELOW GRADE. REFER TO THE MOST RECENT CIVIL DWGS FOR THE FINAL LOCATION AND INVERT ELEVATION AND CONFIRM PRIOR TO ANY WORK. INFORMATION ON THE CIVIL DWGS TAKES PRECEDENCE.
2. 4" W DISCHARGE 5'-0" FROM BUILDING FACE. INVERT 40" MINIMUM BELOW BOTTOM OF SLAB . REFER TO THE MOST RECENT CIVIL DWGS FOR THE FINAL LOCATION AND INVERT ELEVATION AND CONFIRM PRIOR TO ANY WORK. INFORMATION ON THE CIVIL DWGS TAKES PRECEDENCE.
3. METER AND ACCESSORIES BY UTILITY.
4. INSTALL CW SHUTOFF VALVE IN CLOSET.

GENERAL NOTES

1. ALL COLD AND HOT WATER PIPING FROM MANIFOLD TO BE 1/2".
2. COORDINATE EXACT CEILING PANEL ACCESS PANEL LOCATIONS WITH ARCHITECT PRIOR TO COMMENCING WORK.
3. PROVIDE FULL SIZE SHUT-OFF VALVE WITH SERVICE ACCESS FOR CONNECTION TO IMB-1 AT REFRIGERATOR.
4. PROVIDE FULL SIZE SHUT-OFF VALVE WITH SERVICE ACCESS FOR CONNECTION TO DISHWASHER. ROUTE DISHWASHER WASTE THROUGH APPROVED COUNTERTOP AIRGAP FITTING AND CONNECT TO DISPOSER/STANDPIPE.
5. SEE WATER HEATER DETAIL FOR WATER HEATER CLOSET FLOOR DRAIN DISCHARGE ROUTING. CLOSET DRAIN RISER TO AIRGAP TO FLOOR DRAIN IN BOTTOMMOST LEVEL CLOSET.
6. PROVIDE HWC PIPING AND PUMP IF FIXTURE RUNOUT EXCEEDS 43' ON 1/2" HW SUPPLY.

PLUMBING FIXTURE SCHEDULE - UNITS

FIXTURE	ALL UNITS EXCEPT ANSI	ANSI UNITS
BATHTUB/SHOWER	BT-1/SH-1	BT-1A/SH-1A
CLOTHES WASHER BOX	CWB-1	CWB-1
DISHWASHER BOX	DWB-1	DWB-1
LAVATORY	LAV-1	LAV-1A
KITCHEN SINK W/DISPOSAL	S-1	S-1
WATER CLOSET (FLUSH TANK)	WC-1	WC-1A

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, CO 80202
PH: 303.389.0095 | FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

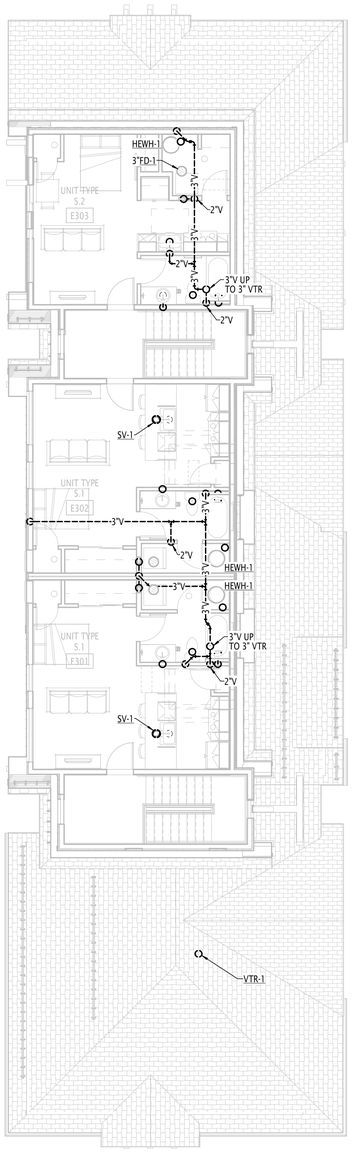
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

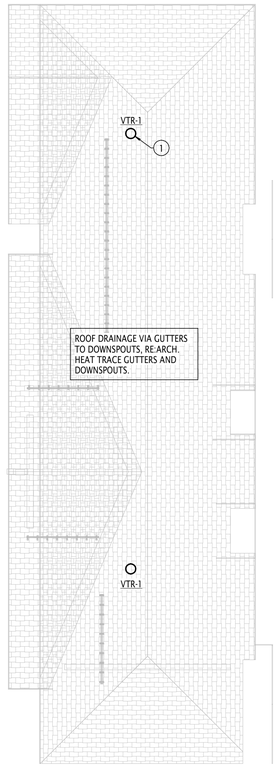
EAST LEVELS 1 & 2 PLUMBING PLAN

PE101

PLOT DATE: 3/23/2022 8:02:59 AM

COPYRIGHT©





1 THIRD FLOOR PLUMBING PLAN EAST

SCALE: 1/8" = 1'-0"

0' 4' 8' 16' 32'

N

2 ROOF PLUMBING PLAN EAST

SCALE: 1/8" = 1'-0"

0' 4' 8' 16' 32'

N

(X) PLUMBING DETAIL NOTES

1 ROOF TERMINATIONS SHALL BE 12" MIN ABOVE ROOF, TYP.

GENERAL NOTES

1. ALL COLD AND HOT WATER PIPING FROM MANIFOLD TO BE 1/2".
2. COORDINATE EXACT CEILING PANEL ACCESS PANEL LOCATIONS WITH ARCHITECT PRIOR TO COMMENCING WORK.
3. PROVIDE FULL SIZE SHUT-OFF VALVE WITH SERVICE ACCESS FOR CONNECTION TO IMB-1 AT REFRIGERATOR.
4. PROVIDE FULL SIZE SHUT-OFF VALVE WITH SERVICE ACCESS FOR CONNECTION TO DISHWASHER. ROUTE DISHWASHER WASTE THROUGH APPROVED COUNTERTOP AIRGAP FITTING AND CONNECT TO DISPOSER/STANDPIPE.
5. SEE WATER HEATER DETAIL FOR WATER HEATER CLOSET FLOOR DRAIN DISCHARGE ROUTING. CLOSET DRAIN RISER TO AIRGAP TO FLOOR DRAIN IN BOTTOMMOST LEVEL CLOSET.
6. PROVIDE HWC PIPING AND PUMP IF FIXTURE RUNOUT EXCEEDS 43' ON 1/2" HW SUPPLY.

PLUMBING FIXTURE SCHEDULE - UNITS

FIXTURE	ALL UNITS EXCEPT ANSI	ANSI UNITS
BATHTUB/SHOWER	BT-1/SH-1	BT-1A/SH-1A
CLOTHES WASHER BOX	CWB-1	CWB-1
DISHWASHER BOX	DWB-1	DWB-1
LAVATORY	LAV-1	LAV-1A
KITCHEN SINK W/DISPOSAL	S-1	S-1
WATER CLOSET (FLUSH TANK)	WC-1	WC-1A

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, CO 80202
PH: 303.389.0095 | FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

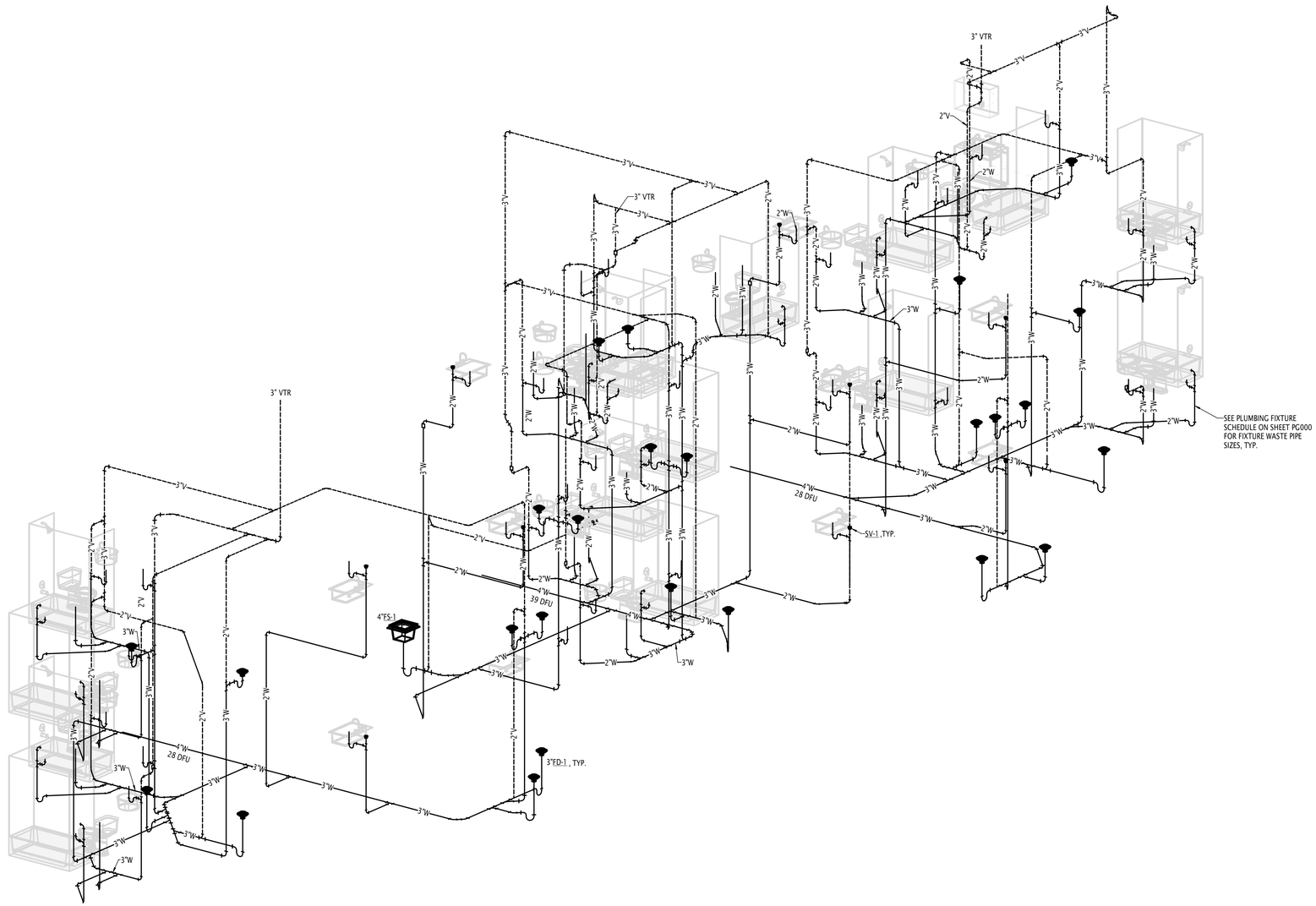
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

EAST LEVELS 3 & ROOF PLUMBING PLAN

PE102

PLOT DATE: 3/23/2022 8:03:05 AM

COPYRIGHT©



1 EAST BLDG WASTE AND VENT ISOMETRIC

NO SCALE

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, CO 80202
PH: 303.389.0095 | FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

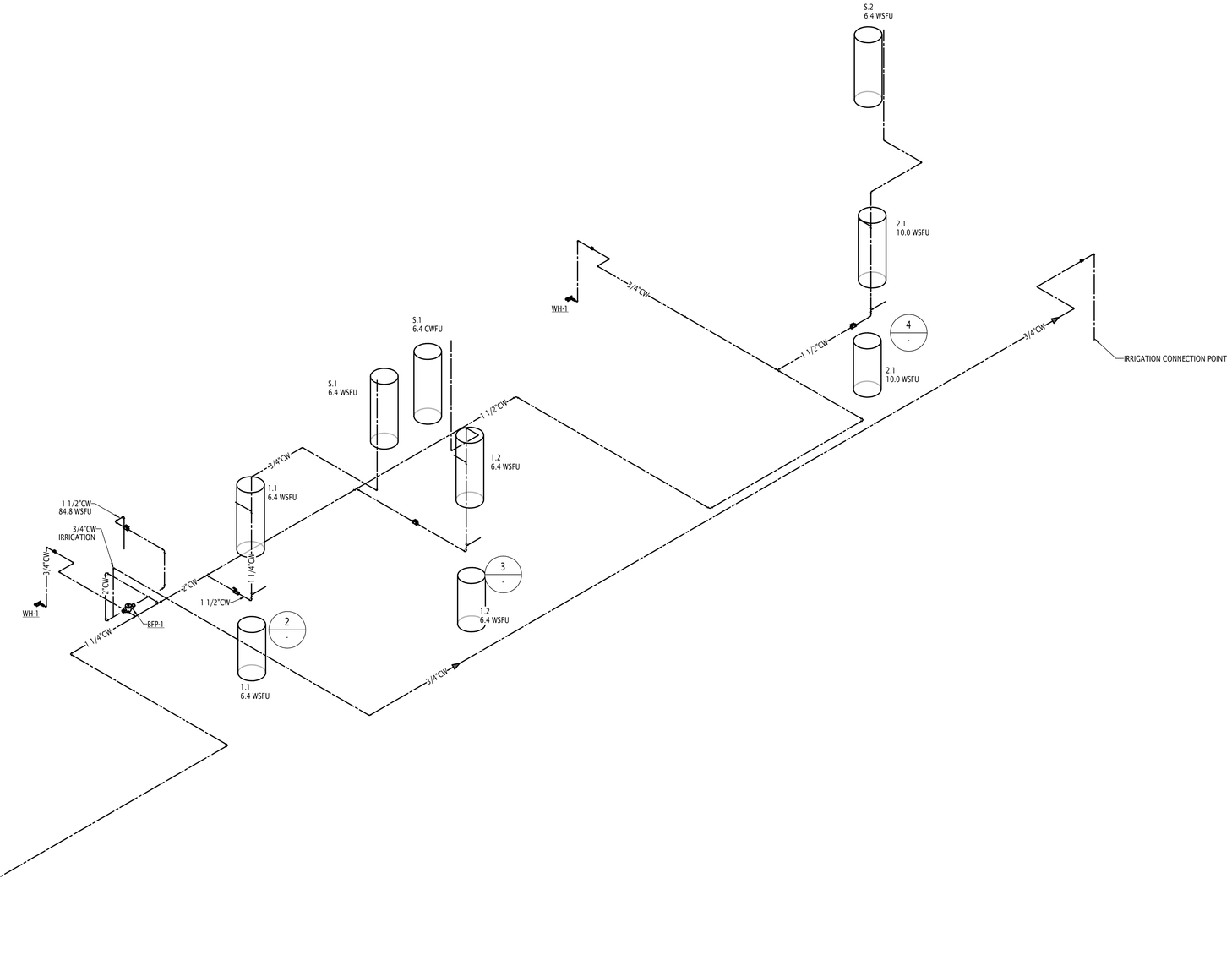
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

EAST WASTE AND VENT ISOMETRIC

PE201

PLOT DATE: 3/23/2022 8:03:09 AM

COPYRIGHT©



1 EAST BLDG DOMESTIC WATER ISOMETRIC

NO SCALE

PLOT DATE: 3/23/2022 8:03:11 AM

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, CO 80202
PH: 303.389.0095 | FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

Sheet Issue & Revision Log

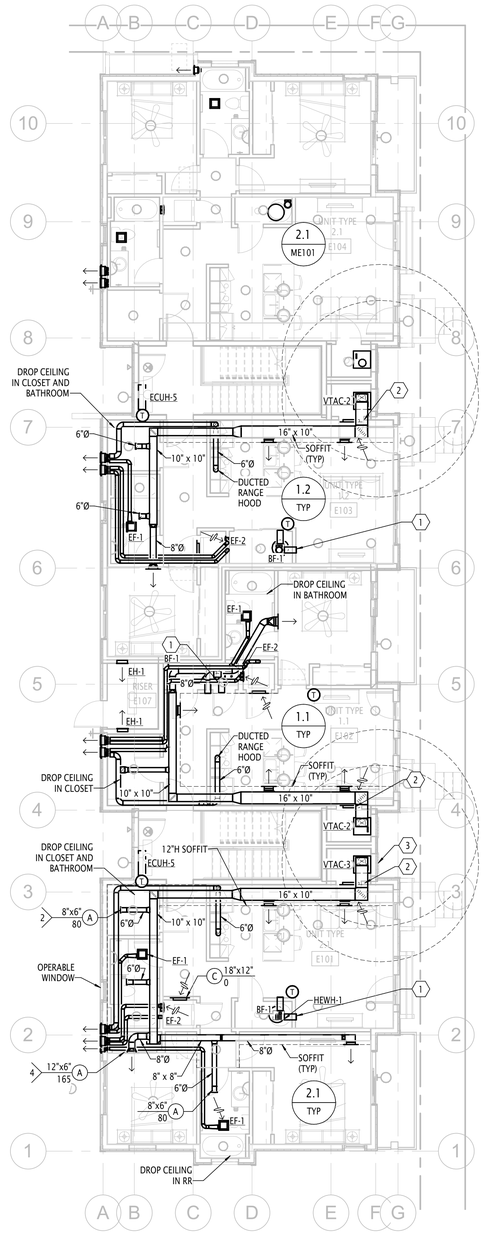
No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

EAST DOMESTIC WATER ISOMETRIC

PE202

COPYRIGHT©

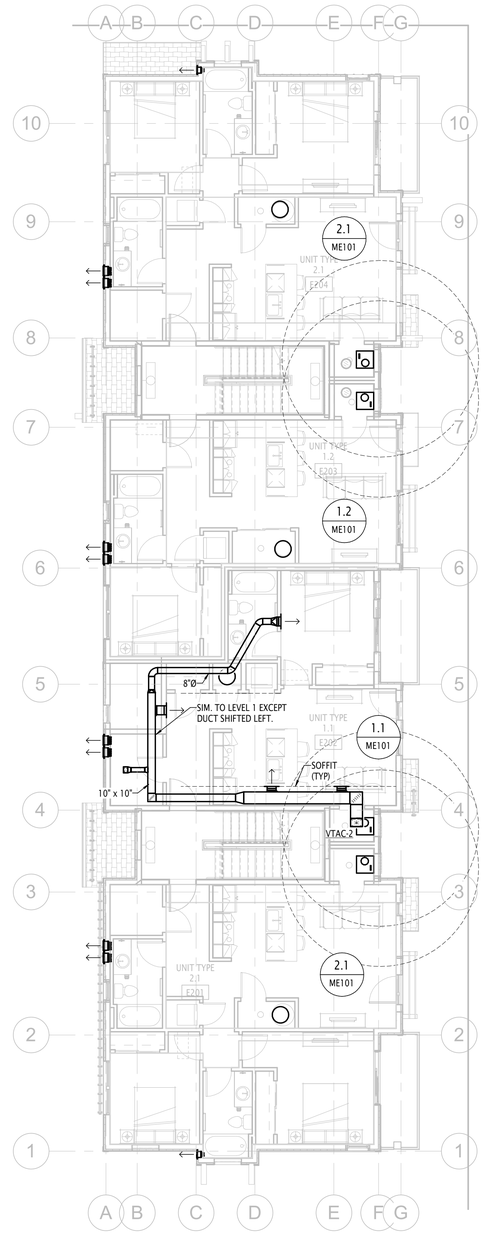


1 FIRST FLOOR MECHANICAL PLAN EAST

SCALE: 1/8" = 1'-0"

0' 4' 8' 16' 32'

N



2 SECOND FLOOR MECHANICAL PLAN EAST

SCALE: 1/8" = 1'-0"

0' 4' 8' 16' 32'

N

MECHANICAL DETAIL NOTES

1 PROVIDE BOOSTER FAN ACCESSORY FOR HYBRID WATER HEATER AND DUCT 8" INTAKE AND SUPPLY TO LIVING SPACE.

2 LOCKABLE DOOR WITH DOOR GRILLE, MIN. 3 SQFT. FREE AREA. (TYP)

3 REFER TO ARCHITECTURAL DRAWINGS FOR VTAC WALL LOUVER, TYP.

GENERAL NOTES

1. ALL SUPPLY DIFFUSERS IN RESIDENTIAL UNITS SHALL BE TYPE 'A' GRILLES UNLESS OTHERWISE NOTED. ROUTE ALL DUCTWORK IN SOFFIT BELOW RATED CEILING ASSEMBLY. PROVIDE HARD ELBOW FITTINGS TO PROVIDE A CLEAR UNOBSTRUCTED AIRFLOW PATH. EACH DIFFUSER SHALL PROVIDE 50-225 CFM AIRFLOW. UNDERCUT DOORS AT ALL BEDROOMS AND RESTROOMS 1" FOR RETURN AIR PATH.
2. PROVIDE TYPE 'B' RETURN GRILLE FOR EACH VTAC UNLESS NOTED OTHERWISE.
3. VENTILATION FOR RESIDENTIAL UNITS PROVIDED THROUGH VTAC OA INTAKE.
4. PROVIDE RADIATION DAMPER MEETING UL REQUIREMENTS AT EACH LOCATION PENETRATING THE CEILING PER 2018 IMC 607.6.2.
5. DRYER AND RESTROOM EXHAUST IS 4"Ø UNLESS OTHERWISE NOTED. PROVIDE FACTORY-MADE RECESSED DRYER BOX. USE DRYER-ELL 90° DRYER VENT ELBOWS FOR ALL 90° ANGLES. PROVIDE LABELING FOR DRYER EXHAUST LONGER THAN 35' TOTAL EQUIVALENT LENGTH PER IMC 504.8.5.
6. PROVIDE MINIMUM OF 100 SQUARE INCHES OF OPENING PER RESIDENTIAL DRYER IN ORDER TO PROVIDE MAKUP AIR PER 2018 IMC 607.6.2.
7. SEE DETAIL 1 & 2 OF SHEET MG003 FOR TERMINATION BOX. REFER TO ARCHITECTURAL FOR COLORS OF WALL TERMINATIONS.
8. VTAC THERMOSTATS SHALL BE REMOTE DIGITAL, 7 DAY PROGRAMMABLE TYPE.
9. PROVIDE INSECT SCREENS ON ALL INTAKE AND EXHAUST NOT USED FOR DRYER VENTS.

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, CO 80202
PH: 303.389.0095 | FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

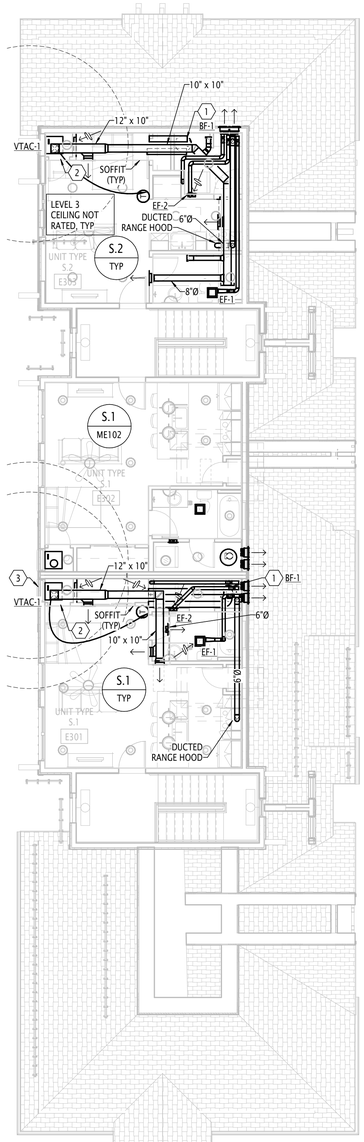
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

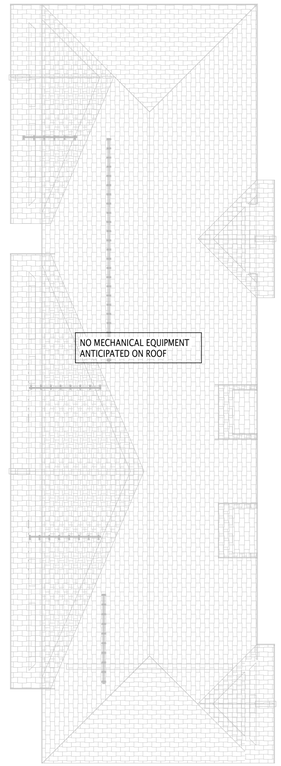
EAST LEVELS 1 & 2
HVAC PLAN

ME101

PLOT DATE: 3/23/2022 8:12:18 AM

COPYRIGHT©





1 THIRD FLOOR MECHANICAL PLAN EAST

SCALE: 1/8" = 1'-0"

0' 4' 8' 16' 32'

N

2 ROOF MECHANICAL PLAN EAST

SCALE: 1/8" = 1'-0"

0' 4' 8' 16' 32'

N

X MECHANICAL DETAIL NOTES

1 PROVIDE BOOSTER FAN ACCESSORY FOR HYBRID WATER HEATER AND DUCT 8" INTAKE AND SUPPLY TO LIVING SPACE.

2 LOCKABLE DOOR WITH DOOR GRILLE, MIN. 3 SQFT. FREE AREA. (TYP)

3 REFER TO ARCHITECTURAL DRAWINGS FOR VTAC WALL LOUVER, TYP.

GENERAL NOTES

1. ALL SUPPLY DIFFUSERS IN RESIDENTIAL UNITS SHALL BE TYPE 'A' GRILLES UNLESS OTHERWISE NOTED. ROUTE ALL DUCTWORK IN SOFFIT BELOW RATED CEILING ASSEMBLY. PROVIDE HARD ELBOW FITTINGS TO PROVIDE A CLEAR UNOBSTRUCTED AIRFLOW PATH. EACH DIFFUSER SHALL PROVIDE 50-225 CFM AIRFLOW. UNDERCUT DOORS AT ALL BEDROOMS AND RESTROOMS 1" FOR RETURN AIR PATH.
2. PROVIDE TYPE 'B' RETURN GRILLE FOR EACH VTAC UNLESS NOTED OTHERWISE.
3. VENTILATION FOR RESIDENTIAL UNITS PROVIDED THROUGH VTAC OA INTAKE.
4. PROVIDE RADIATION DAMPER MEETING UL REQUIREMENTS AT EACH LOCATION PENETRATING THE CEILING PER 2018 IMC 607.6.2.
5. DRYER AND RESTROOM EXHAUST IS 4"Ø UNLESS OTHERWISE NOTED. PROVIDE FACTORY-MADE RECESSED DRYER BOX. USE DRYER-ELL 90° DRYER VENT ELBOWS FOR ALL 90° ANGLES. PROVIDE LABELING FOR DRYER EXHAUST LONGER THAN 35' TOTAL EQUIVALENT LENGTH PER IMC 504.8.5.
6. PROVIDE MINIMUM OF 100 SQUARE INCHES OF OPENING PER RESIDENTIAL DRYER IN ORDER TO PROVIDE MAKUP AIR PER 2018 IMC 607.6.2.
7. SEE DETAIL 1 & 2 OF SHEET MG003 FOR TERMINATION BOX. REFER TO ARCHITECTURAL FOR COLORS OF WALL TERMINATIONS.
8. VTAC THERMOSTATS SHALL BE REMOTE DIGITAL, 7 DAY PROGRAMMABLE TYPE.
9. PROVIDE INSECT SCREENS ON ALL INTAKE AND EXHAUST NOT USED FOR DRYER VENTS.

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, CO 80202
PH: 303.389.0095 | FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

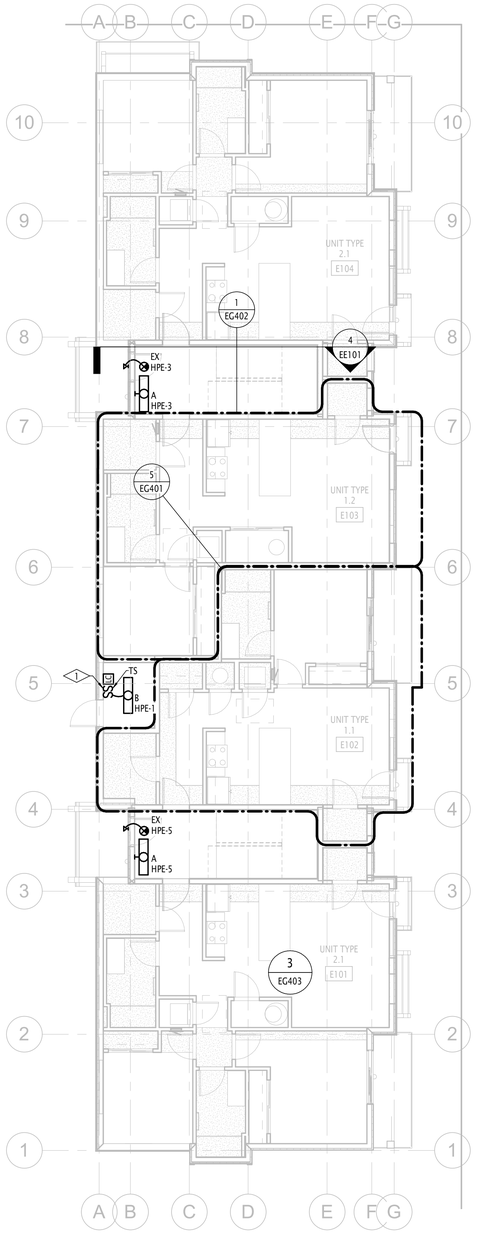
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

EAST LEVELS 3 & ROOF HVAC PLAN

ME102

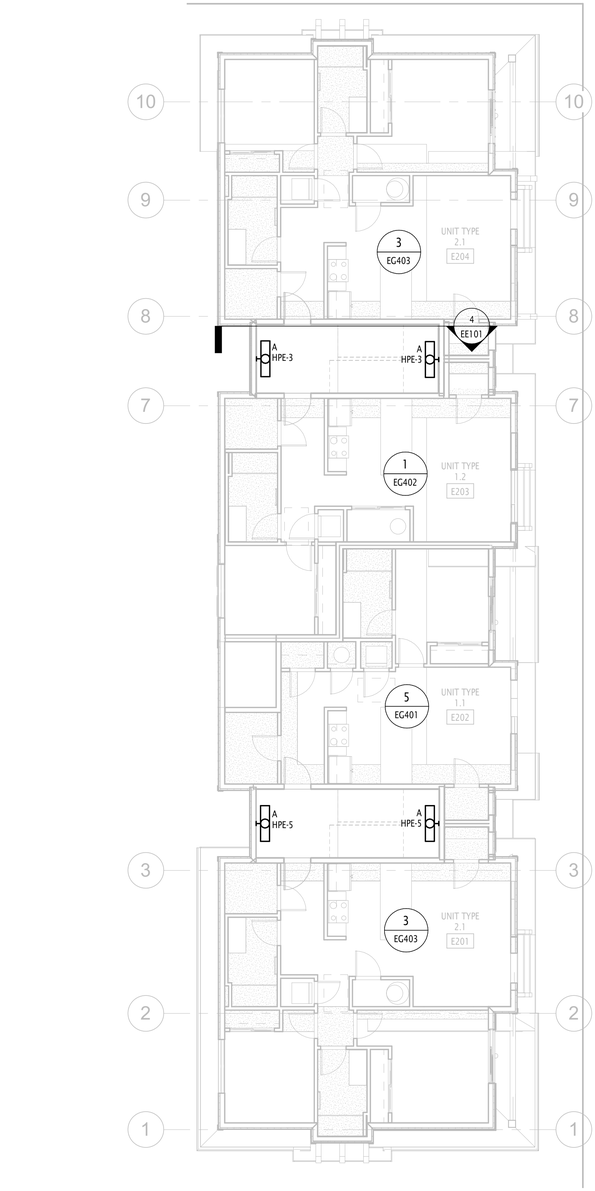
PLOT DATE: 3/23/2022 8:12:26 AM

COPYRIGHT©



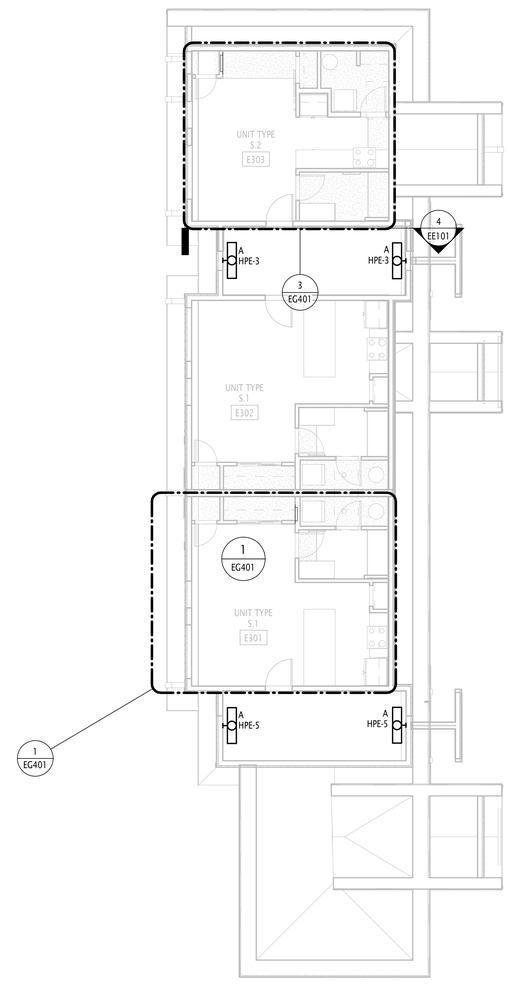
1 FIRST FLOOR LIGHTING PLAN EAST

SCALE: 1/8" = 1'-0"



2 SECOND FLOOR LIGHTING PLAN EAST

SCALE: 1/8" = 1'-0"



3 THIRD FLOOR LIGHTING PLAN EAST

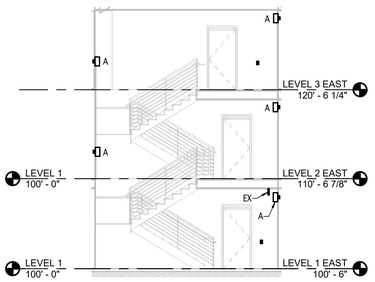
SCALE: 1/8" = 1'-0"

LIGHTING NOTES

1. THESE NOTES APPLAY TO ALL LIGHTING PLANS.
2. FURNISH AND INSTALL LIGHT FIXTURES COMPLETE WITH LAMPS, BALLAST(S), AND MOUNTING HARDWARE. ELECTRICAL CONTRACTOR SHALL SUBMIT FIXTURE CUT SHEETS TO CLIENT AND ARCHITECT FOR THEIR FINAL APPROVAL PRIOR TO ORDERING OF THE LUMINARIES. ELECTRICAL CONTRACTOR SHALL ALSO VERIFY QUANTITIES, MOUNTING REQUIREMENTS, FINISHES, FIXTURE AVAILABILITY AND LEAD TIME FOR DELIVERY TO SITE.
3. COORDINATE LAYOUT AND INSTALLATION OF LIGHTING FIXTURES AND SUSPENSION SYSTEM WITH OTHER CONSTRUCTION THAT PENETRATES CEILINGS OR IS SUPPORTED BY THEM, INCLUDING HVAC EQUIPMENT, FIRE-SUPPRESSION SYSTEM, AND PARTITION ASSEMBLIES. PRIOR TO COMMENCING OF WORK, NOTIFY ENGINEER OF ANY CONFLICTS BETWEEN HVAC EQUIPMENT AND LOCATION OF LIGHT FIXTURES. VERIFY CLEARANCES REQUIRED.
4. ALL LIGHTING FIXTURES SHALL BE POSITIVELY ATTACHED TO THE SUSPENDED CEILING SYSTEM BY MECHANICAL MEANS SUCH AS BOLTS, SCREWS, OR RIVETS. LISTED SUPPORT CLIPS, IDENTIFIED FOR USE WITH THE TYPE OF CEILING GRID MEMBER AND LUMINAIRE, ARE PERMITTED AT OR NEAR EACH FIXTURE CORNER. IN ADDITION, FIXTURES WEIGHING LESS THAN 50 POUNDS SHALL HAVE A MINIMUM OF TWO NO. 9 GAUGE WIRES CONNECTED FROM THE OPPOSITE CORNERS OF THE FIXTURE HOUSING TO THE STRUCTURE DIRECTLY ABOVE THE FIXTURE. FIXTURES ABOVE 50 POUNDS SHALL BE SUPPORTED DIRECTLY FROM THE STRUCTURE. FIXTURES OF SIZES LESS THAN CEILING GRID SHALL BE SUPPORTED INDEPENDENTLY WITH AT LEAST TWO 3/4-INCH METAL CHANNELS SPANNING AND SECURED TO CEILING TEES. DO NOT USE GRID AS SUPPORT FOR PENDANT FIXTURES; CONNECT SUPPORT WIRES OR RODS TO BUILDING STRUCTURE.
5. SUPPORT FLEXIBLE WIRING WHIPS FOR ALL FIXTURES INDEPENDENTLY OF THE GRID SUPPORT SYSTEM.
6. MULTIPLE LIGHT SWITCHES SHALL BE MOUNTED IN A MULTIPLE GANG BOX WITH SINGLE COVER PLATE.
7. EACH MULTIWIRE BRANCH CIRCUIT SHALL BE PROVIDED WITH A MEANS THAT WILL SIMULTANEOUSLY DISCONNECT ALL UNGROUNDED CONDUCTORS AT THE POINT WHERE THE BRANCH CIRCUIT ORIGINATES. DISCONNECTION CAN BE ACCOMPLISHED THROUGH IDENTIFIED HANDLE TIES USE WITH SINGLE-POLE CIRCUIT BREAKERS OR MULTI-POLE DEVICES. BRANCH CIRCUIT SERVING EMERGENCY LIGHTING CIRCUITS SHALL NOT BE PART OF A MULTIWIRE BRANCH CIRCUIT.
8. THE UNGROUNDED AND GROUNDED CONDUCTORS OF EACH MULTIWIRE BRANCH CIRCUIT SHALL BE GROUPED BY WIRE TIES OR SIMILAR MEANS IN AT LEAST ONE LOCATION WITHIN THE PANELBOARD OR OTHER POINT OF ORIGIN.
9. A GROUNDED (NEUTRAL) CIRCUIT CONDUCTOR OF THE LIGHTING CIRCUIT SHALL BE PROVIDED AT THE LIGHT SWITCH LOCATION.
10. ALL SWITCHES SHALL BE LABELED WITH DESIGNATED PANEL AND CIRCUIT NUMBER ON THE COVER PLATE.
11. LIGHT FIXTURES SHOWN SHADED, EMERGENCY LIGHT UNITS, AND EXIT SIGNS SHALL BE CONNECTED TO THE LIGHTING CIRCUIT SERVING THE NORMAL LIGHTING IN THE AREA AND CONNECTED AHEAD OF ANY LOCAL SWITCHES. ALL THESE FIXTURES SHALL BE EQUIPPED WITH BATTERY OF SUITABLE RATING AND CAPACITY TO SUPPLY AND MAINTAIN THE FIXTURE LOAD FOR A MINIMUM PERIOD OF 90 MINUTES.
12. LOCATIONS OF THE EXIT SIGNS SHALL BE COORDINATED WITH LOCAL AUTHORITIES. PROVIDE SIGNS IN ADDITIONAL LOCATIONS IF REQUESTED BY LOCAL AUTHORITIES.
13. MOUNT NEW WALL SWITCHES 48" ABOVE FINISHED FLOOR (A.F.F.).

ELECTRICAL DETAIL NOTES

1 EXTERIOR LIGHT FIXTURES TO BE CONTROLLED VIA ASTRONOMICAL TIME SWITCH. REFER TO SHEET EG101, ELECTRICAL SITE PLAN, FOR SITE LIGHTING LAYOUT, CIRCUIT INFORMATION AND BUILDING CONTROL DESIGNATION.



4 TYPICAL EAST BUILDING STAIRWELL ELEVATION

NO SCALE

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, CO 80202
PH: 303.389.0095 | FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

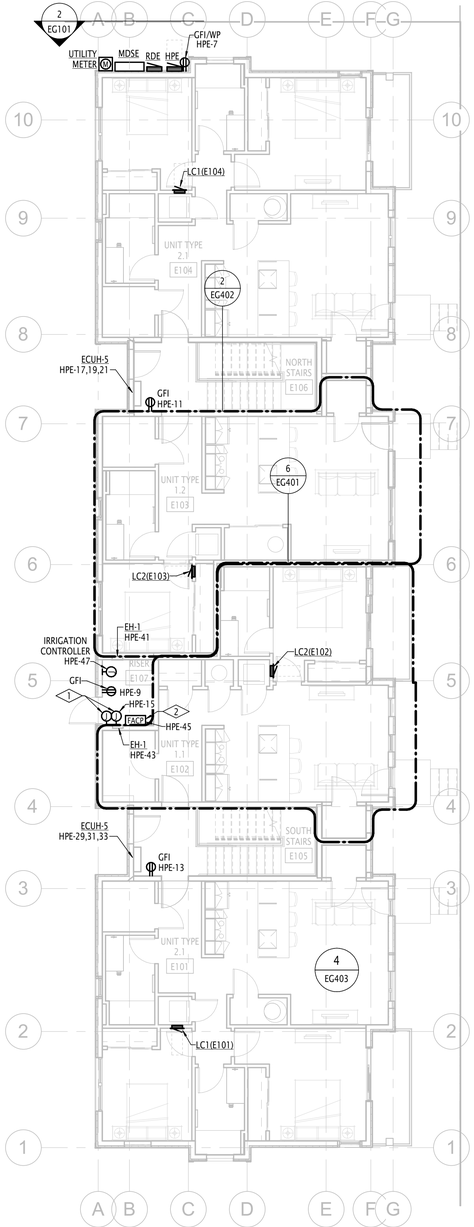
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

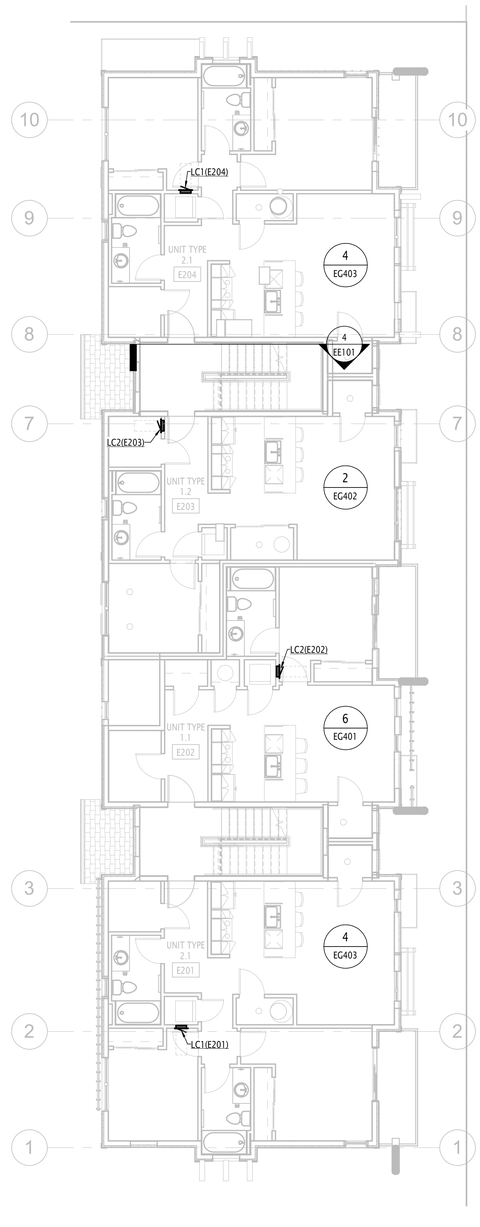
EAST LIGHTING PLANS

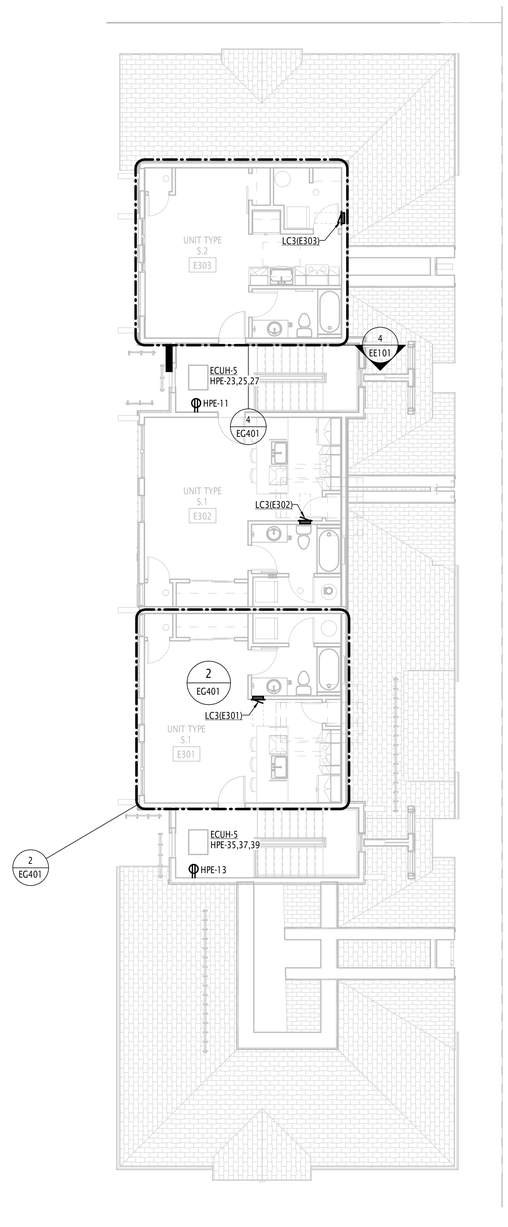
EE101

PLOT DATE: 3/23/2022 8:19:45 AM

COPYRIGHT©







1 FIRST FLOOR POWER PLAN EAST

SCALE: 1/8" = 1'-0"

0' 4' 8' 16' 32'

N

2 SECOND FLOOR POWER PLAN EAST

SCALE: 1/8" = 1'-0"

0' 4' 8' 16' 32'

N

3 THIRD FLOOR POWER PLAN EAST

SCALE: 1/8" = 1'-0"

0' 4' 8' 16' 32'

N

POWER NOTES

1. THESE NOTES APPLAY TO ALL POWER PLANS.
2. NEW WALL MOUNTED POWER, DATA AND COMMUNICATIONS OUTLETS SHALL BE MOUNTED 18" A.F.F. (FROM FLOOR TO CENTERLINE OF THE BOX, U.N.O.) IN ORDER TO COMPLY WITH ADA REQUIREMENTS.
3. CONTRACTOR SHALL COORDINATE EXACT OUTLET AND DEVICE LOCATIONS WITH OWNER/CLIENT/ARCHITECT OR EQUIPMENT SUBCONTRACTOR.
4. RECEPTACLE OUTLETS AND SWITCHES SHALL BE LABELED WITH DESIGNATED PANEL AND CIRCUIT NUMBER ON OR INSIDE THE COVER PLATE. JUNCTION BOXES AND DISCONNECTS SHALL HAVE CIRCUIT NUMBERS MARKED ON THE COVER..
5. 125-VOLT, SINGLE PHASE, 15- AND 20-AMPERE RECEPTACLES INSTALLED IN BATHROOMS, KITCHEN/FOOD PREPARATION AREAS, OUTDOOR, WITHIN SIX FEET OF THE OUTSIDE EDGE OF THE SINK, OR IN GARAGES, SERVICE BAYS, AND SIMILAR AREAS WHERE ELECTRICAL HAND TOOLS OR PORTABLE LIGHTING EQUIPMENT ARE TO BE USED SHALL HAVE GROUND-FAULT CIRCUIT-INTERRUPTER PROTECTION FOR PERSONNEL PER NATIONAL ELECTRICAL CODE (NEC) ARTICLE 210.8. THE GROUND-FAULT CIRCUIT INTERRUPTER SHALL BE INSTALLED IN A READILY ACCESSIBLE LOCATION.
6. WHEN RECEPTACLE IS MARKED AS "GFI", GFCI PROTECTION NEEDS TO BE PROVIDED. PROVIDE GFCI-TYPE CIRCUIT BREAKER OR RECEPTACLE. WHEN MULTIPLE RECEPTACLES ARE SHOWN AS "GFI" AND CONNECTED TO THE SAME CIRCUIT NOT PROTECTED BY GFCI-TYPE CIRCUIT BREAKER, FIRST RECEPTACLE IN THE BRANCH CIRCUIT NEEDS TO BE GFCI-TYPE WITH ALL OTHER RECEPTACLES CONNECTED TO THE LOAD SIDE OF THIS RECEPTACLE.
7. EACH MULTIWIRE BRANCH CIRCUIT SHALL BE PROVIDED WITH A MEANS THAT WILL SIMULTANEOUSLY DISCONNECT ALL UNGROUNDED CONDUCTORS AT THE POINT WHERE THE BRANCH CIRCUIT ORIGINATES. DISCONNECTION CAN BE ACCOMPLISHED THROUGH IDENTIFIED HANDLE TIES USE WITH SINGLE-POLE CIRCUIT BREAKERS OR MULTI-POLE DEVICES. THE BRANCH CIRCUIT SERVING EMERGENCY POWER CIRCUITS SHALL NOT BE PART OF A MULTIWIRE BRANCH CIRCUIT.
8. THE UNGROUNDED AND GROUNDED CONDUCTORS OF EACH MULTIWIRE BRANCH CIRCUIT SHALL BE GROUPED BY WIRE TIES OR SIMILAR MEANS IN AT LEAST ONE LOCATION WITHIN THE PANELBOARD OR OTHER POINT OF ORIGIN.
9. OUTLET BOXES, INSTALLED ON EDGES OF METAL STUDS, ARE REQUIRED TO BE SECURED IN PLACE BY THE ADDITIONAL USE OF BOX-BACK SUPPORTS PER NEC ARTICLE 314.23.
10. PRIOR TO ANY REQUIRED CORE-DRILLING OF CONCRETE FLOOR OR WALLS, CONTRACTOR SHALL X-RAY. COORDINATE SCHEDULE WITH GENERAL CONTRACTOR.
11. DATA AND TELECOMMUNICATIONS CABLING SHALL BE INSTALLED BY CLIENT'S VENDOR. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING REQUIRED JUNCTION BOXES AND RACEWAYS ROUGH-INS WITH APPROPRIATE VENDOR.
12. PROVIDE INDIVIDUAL 1" EMT CONDUIT FROM EACH PHONE/DATA OUTLET, CONSISTING MULTIPLE CONNECTORS AND REQUIRING MULTIPLE CABLES TO BE INSTALLED, STUBBED MINIMUM 3" INTO ACCESSIBLE CEILING SPACE. INSTALL INSULATION BUSHING AND PROVIDE PULL WIRE. COORDINATE REQUIREMENTS WITH TELECOMMUNICATIONS CONTRACTOR.
13. FROM EACH NEW SINGLE PHONE, COMMUNICATIONS OR COAXIAL CABLE OUTLET, CONSISTING OF A SINGLE CONNECTOR AND REQUIRING A SINGLE CABLE TO BE INSTALLED, PROVIDE 3/4" CONDUIT STUBBED MINIMUM 3" INTO ACCESSIBLE CEILING SPACE AND BUSHED. PROVIDE PULL WIRE. COORDINATE REQUIREMENTS WITH TELECOMMUNICATIONS CONTRACTOR.
14. BACK-TO-BACK OUTLETS IN THE SAME WALL AND THRU-WALL TYPE BOXES NOT PERMITTED. PROVIDE NIPPLE (LENGTH AS REQUIRED) TO OFFSET FOR ALL OUTLETS SHOWN ON OPPOSITE SIDES OF A COMMON WALL TO MINIMIZE SOUND TRANSMISSION.
15. PROTRUSIONS PROHIBITED IN DEDICATED ELECTRICAL SPACE IN FRONT OF ALL ELECTRICAL EQUIPMENT REQUIRING SERVICING WHILE ENERGIZED. THIS INCLUDES CONTROL PANELS AND ELECTRICAL DISCONNECTS AT OR INSIDE ROOFTOP HVAC UNITS, CONDENSING UNITS AND AIR CONDITIONING UNITS LOCATED ABOVE CEILINGS AND AT GRADE LEVEL. PENETRATIONS SUCH AS ROOF JACKS FOR ELECTRICAL POWER, LOW VOLTAGE CONTROL POWER, REFRIGERANT LINES, VENT PIPES, ETC., AND INCLUDING GAS LINES, DUCTWORK, ROOF DRAINS, SCREENING WALLS AND OTHER EQUIPMENT OF ANY TYPE, IS NOT TO PROTRUDE INTO THIS SPACE. MINIMUM SPACE IN FRONT OF ELECTRIC EQUIPMENT SHALL BE THE WIDTH OF THE EQUIPMENT OR 30 INCHES, WHICHEVER IS GREATER, AND 36 INCHES EXTENDING OUT FROM ENCLOSURE FRONT TO A FLAT LEVEL ROOF, GRADE, FLOOR, OR PLATFORM TO THE HEIGHT OF 6.5 FEET.
16. FOR HEATING, AIR-CONDITIONING, AND REFRIGERATION EQUIPMENT SHALL BE PROVIDED A 125-VOLT, 15- OR 20-AMPERE RATED RECEPTACLE OUTLET, INSTALLED AT AN ACCESSIBLE LOCATION FOR THE SERVICING OF HEATING, AIR-CONDITIONING, AND REFRIGERATION EQUIPMENT. THE RECEPTACLE SHALL BE LOCATED ON THE SAME LEVEL AND WITHIN 25 FEET OF THE EQUIPMENT, AND NOT BE CONNECTED TO THE LOAD SIDE OF THE EQUIPMENT DISCONNECT MEANS. THE RECEPTACLE OUTLET SHALL BE WEATHERPROOF, GFI PROTECTED IF INSTALLED OUTDOOR OR IN THE WET LOCATION.
17. AN INDIVIDUAL DISCONNECTING MEANS SHALL BE PROVIDED IN SIGHT FROM THE LOCATION FOR EACH MOTOR OR THE DRIVEN MACHINERY IN ACCORDANCE WITH NEC ARTICLE 430.
18. MECHANICAL CONTRACTOR SHALL FURNISH STARTERS FOR ALL THREE-PHASE MECHANICAL EQUIPMENT (EXCEPT FOR STARTERS THAT ARE SHOWN TO BE PROVIDED IN MOTOR CONTROL CENTERS). STARTERS SHALL HAVE OVERLOAD PROTECTION, WITH MANUAL RESET, AND SHALL BE NEMA RATED. STARTERS SHALL BE INSTALLED BY ELECTRICAL CONTRACTOR EXCEPT WHERE SUPPLIED AS INTEGRAL PART OF THE MECHANICAL EQUIPMENT. ELECTRICAL CONTRACTOR SHALL PROVIDE SAFETY DISCONNECT SWITCHES FOR ALL MECHANICAL EQUIPMENT WHERE NOT SPECIFICALLY INDICATED ON MECHANICAL PLANS TO BE PROVIDED BY MECHANICAL CONTRACTOR.
19. IF RACEWAYS ARE INSTALLED EXPOSED TO DIRECT SUNLIGHT ON OR ABOVE ROOFTOPS CORRECTIONS NEED TO BE PROVIDED FOR CONDUCTOR SIZES BASED ON TEMPERATURE ADJUSTMENTS. THE ADJUSTMENTS SHOWN IN NEC TABLE 310.15(B)(3)(c) SHALL BE ADDED TO THE OUTDOOR TEMPERATURE TO DETERMINE THE APPLICABLE AMBIENT TEMPERATURE FOR APPLICATION OF THE CORRECTION FACTORS IN TABLE 310.15(B)(2)(a) OR TABLE 310.15(B)(2)(b).
20. THE BUILDING HAS AREAS OF WOOD CONSTRUCTION TYPE III-A OR V-A. THE ENGINEER ASSUMES THAT THE ELECTRICAL CONTRACTOR WILL BE USING NONMETALLIC-SHEATHED CABLE TYPES NM AND SERVICE ENTRANCE CABLE TYPE SE OR EQUAL FOR THE ELECTRICAL INSTALLATION IN THESE AREAS. ANY ELECTRICAL PANELS SHOWN IN THESE AREAS NEED TO BE RECESSED IN A MINIMUM OF 6-INCH WALL OR BE SURFACE-MOUNTED AND THE WALL TO BE FURRED ABOVE AND BELOW THE PANEL TO CONCEAL THE CABLES AS REQUIRED PER NEC ARTICLES 334.10 AND 338.10. ELECTRICAL CONTRACTOR TO COORDINATE INSTALLATION AND ADDITIONAL WORK REQUIRED WITH THE ARCHITECT AND GENERAL CONTRACTOR.

X ELECTRICAL DETAIL NOTES

1 ELECTRICAL CONTRACTOR TO PROVIDE JUNCTION BOX, CONDUIT AND PULL STRING FROM RESIDENTIAL DISTRIBUTION PANEL, RDE, TO APPROXIMATE LOCATION SHOWN FOR CONNECTION TO DATA COLLECTION UNIT, DCU. PROVIDE 120V CIRCUIT (PANEL HPE, CIRCUIT #15). COORDINATE EXACT LOCATION PER MANUFACTURER SPECIFICATIONS AND WITH MECHANICAL AND PLUMBING CONTRACTORS PRIOR TO PERFORMING ANY WORK. COORDINATE ANY ADDITIONAL INSTALLATION REQUIREMENTS WITH MANUFACTURER SPECIFICATIONS PRIOR TO PERFORMING ANY WORK.

2 COORDINATE EXACT LOCATION OF FIRE ALARM CONTROL PANEL WITH ARCHITECT PRIOR TO ROUGH-IN.

ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, CO 80202
PH: 303.389.0095 | FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

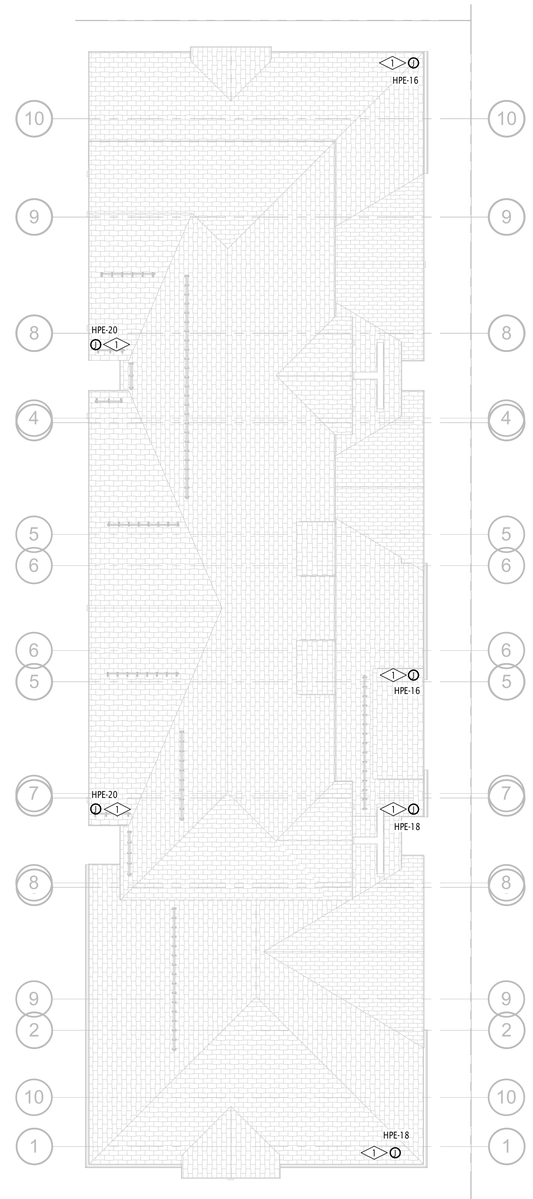
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

EAST POWER PLANS

EE102

PLOT DATE: 3/23/2022 8:19:53 AM

COPYRIGHT©



ELECTRICAL DETAIL NOTES

1 RECOMMENDED LOCATION FOR LINEAR SNOWMELT TAPE JUNCTION BOX AND CONNECTION. EXACT ELECTRICAL SPECIFICATION OF LINEAR SNOWMELT TAPE AND ASSOCIATED EQUIPMENT UNKNOWN AT TIME OF DESIGN; 375VA, 120V, 1-PHASE, HARDWIRED CONNECTION ASSUMED. PROVIDE (2-10 & 1-10GND) CONDUCTORS TO COMPENSATE FOR VOLTAGE DROP. COORDINATE EXACT ELECTRICAL SPECIFICATIONS, LINEAR SNOW MELT TAPE LOCATION, CONTROL PANEL LOCATION (IF REQUIRED) AND ANY ADDITIONAL INSTALLATION REQUIREMENTS WITH OWNER'S SNOWMELT VENDOR AND MANUFACTURER SPECIFICATIONS PRIOR TO PERFORMING ANY WORK.

1 ROOF POWER PLAN EAST

SCALE: 1/8" = 1'-0"

0' 4' 8' 16' 32'

N

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8th FLOOR
DENVER, CO 80202
PH: 303.389.0095 | FAX: 303.389.0096
www.MDPEG.com
JOB # 21027.01

MDP ENGINEERING GROUP
1800 GLENARM PLACE, 8TH FL
DENVER CO, 80202
www.MDPEG.com
303.389.0095

BID SET ISSUANCE

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

MDP Project No: 21027.01

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

EAST ROOF POWER PLAN

EE103

PLOT DATE: 3/23/2022 8:19:56 AM

COPYRIGHT©

STANDARDS

- ALL DESIGN HAS BEEN COMPLETED IN ACCORDANCE WITH THESE STANDARDS.
- ALL CONSTRUCTION SHALL CONFORM TO THE REQUIREMENTS OF THE CITED VERSION OF THE FOLLOWING STANDARDS REFERENCED IN THE BUILDING CODE.

PROJECT SCOPE	THESE STRUCTURAL DRAWINGS MAY ONLY BE USED TO CONSTRUCT THE PROJECT LOCATED AT 619 GRANITE STREET IN FRISCO, COLORADO
BUILDING CODE	2018 INTERNATIONAL BUILDING CODE & REQUIREMENTS OF TOWN OF FRISCO
GEOTECHNICAL REPORT	REPORT PREPARED BY KUMAR & ASSOCIATES, INC. OF SILVERTHORNE, CO, DATED NOVEMBER 27, 2020 (REPORT 20-6-254)
STRUCTURAL LOADS	ASCE-7 "MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES"
CONCRETE	ACI 301: "SPECIFICATIONS FOR STRUCTURAL CONCRETE BUILDINGS" ACI 318: "BUILDING CODE REQUIREMENTS FOR STRUCURAL CONCRETE AND COMMENTARY" ACI 306: "GUIDE TO COLD WEATHER CONCRETING" ACI SP 66: "ACI DETAILING MANUAL" ACI 117: "SPECIFICATION FOR TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS" PORTLAND CEMENT ASSOCIATION "DESIGN AND CONTROL OF CONCRETE MIXTURES" CRSI'S "MANUAL OF STANDARD PRACTICE"
STEEL	ANSI/AISC 360: "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS" AISC 303: "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" RCSC: "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS"
WELDING	AWS D1.1/D1.1M: "STRUCTURAL WELDING CODE-STEEL" AWS D1.4: "STRUCTURAL WELDING CODE-REINFORCING STEEL" AWS D9.1: "SHEET METAL WELDING CODE"
WOOD	ANSI/AF&PA NDS "NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION"
WOOD TRUSSES	TRUSS PLATE INSTITUTE PUBLICATION "HIB-91 COMMENTARY & RECOMMENDATIONS FOR HANDLING, INSTALLING, & BRACING METAL PLATE CONNECTED WOOD TRUSSES"

DESIGN LOADS

ALL LOADS ARE SUBJECT TO MODIFICATION PER REQUIREMENTS OF ASCE-7

	RISK CATEGORY	II
LIVE		UNIFORM (PSF) | CONCENTRATED (LB)
	CORRIDORS: FIRST FLOOR	100 | ---
	CORRIDORS: OTHER FLOORS	SAME AS OCCUPANCY SERVED
	RESIDENTIAL: UNINHABITABLE ATTICS W/O STORAGE	10 | ---
	RESIDENTIAL: UNINHABITABLE ATTICS W/ STORAGE	20 | ---
	RESIDENTIAL: PRIVATE ROOMS & CORRIDORS SERVING THEM	40 | ---
	RESIDENTIAL: PUBLIC ROOMS & CORRIDORS SERVING THEM	40 | ---
	ROOFS: SURFACES SUBJECT TO MAINTENANCE WORKERS	--- | 300
	ROOFS: ALL OTHER CONSTRUCTION	20 | ---
	STAIRS & EXITS: ONE & TWO-FAMILY DWELLINGS	40 | 300
	STAIRS & EXITS: ALL OTHER	100 | 300
SEISMIC	SEISMIC IMPORTANCE FACTOR	Ie = 1.0
	SITE CLASSIFICATION OF SOIL	D
	1.0 SECOND SPECTRAL RESPONSE	S1 = 0.083 Fv = 2.4 SD1 = 0.133
	0.2 SECOND SPECTRAL RESPONSE	Ss = 0.325 Fa = 1.6 SDS = 0.316
	SEISMIC DESIGN CATEGORY	B
	LATERAL RESISTING SYSTEM	LIGHT-FRAME (WOOD) WALLS SHEATHED W/ WOOD STRUCTURAL PANELS RATED FOR SHEAR RESISTANCE
	SEISMIC RESPONSE COEFFICIENT	Cs = 0.0487
	RESPONSE MODIFICATION FACTOR	R = 6.5
	ANALYSIS PROCEDURE USED	EQUIVALENT LATERAL FORCE PROCEDURE
	DESIGN BASE SHEAR	V = 45.19 KIPS
SNOW	GROUND SNOW	Pg = 80 PSF
	IMPORTANCE FACTOR	Is = 1.0
	EXPOSURE FACTOR	Ce = 1.0
	THERMAL FACTOR	Ct = 1.0
	FLAT ROOF SNOW LOAD	Pf = 56 PSF
	DRIFT SNOW LOAD	MAPPED ON PLAN
	FROST DEPTH	40 IN
WIND	BASIC WIND SPEED (3-SEC)	V = 90 MPH
	EXPOSURE CATEGORY	B
	TOPOGRAPHIC FACTOR	Kzt = 1.0
	INTERNAL PRESSURE COEFFICIENT	(GCpi) = ±0.18
	ENCLOSURE CLASSIFICATION	ENCLOSED

COMPONENT & CLADDING WIND LOADS

- PLUS AND MINUS SIGNS SIGNIFY PRESSURES ACTING TOWARD AND AWAY FROM THE SURFACES, RESPECTIVELY.
- EACH COMPONENT SHALL BE DESIGNED FOR MAXIMUM POSITIVE AND NEGATIVE PRESSURES.
- DISTANCE a = 10% OF LEAST HORIZONTAL DIMENSION OR 0.4h, WHICHEVER IS SMALLER, BUT NOT LESS THAN EITHER 4% OF LEAST HORIZONTAL DIMENSION OR 3 FT.
- h = MEAN ROOF HEIGHT, IN FT, EXCEPT THAT EAVE HEIGHT SHALL BE USED FOR ROOF SLOPE LESS THAN OR EQUAL TO 10%
- LINEAR INTERPOLATION OF WIND LOADS FOR AREAS BETWEEN THOSE IN TABLE IS NOT ACCEPTABLE.

ZONE	EFFECTIVE WIND AREA (FT²) LESS THAN 10	100	GREATER THAN 500
ROOF 1	8.62/-13.69	6.09/-12.43	-
ROOF 2	8.62/-23.84	6.09/-17.50	-
ROOF 3	8.62/-35.25	6.09/-27.64	-
WALL 4	14.96/-16.23	-	11.16/-12.43
WALL 5	14.96/-20.03	-	11.16/-12.43

MATERIALS

SOIL	SOIL SUPPORTING SHALLOW FOUNDATIONS	2,000 PSF MAX ALLOWABLE BRG CAPACITY (DEAD LOAD PLUS HALF LIVE LOAD)
	LATERAL AT-REST PRESSURE EFP	50 PCF
	LATERAL ACTIVE PRESSURE EFP	40 PCF
	PASSIVE PRESSURE	460 PCF
	CO-EFFICIENT OF FRICTION	0.45
REINFORCING	REINF #4 AND LARGER	ASTM A615 (GRADE 60)
	#3 REINF	ASTM A615 (GRADE 40)
	BARS TO BE WELDED	ASTM A706 (GRADE 60)
	WELDED WIRE FABRIC	ASTM A1064 FLAT SHEETS
	SYNTHETIC FIBER REINFORCING	ASTM C1116 (TUF-STRAND BY EUCID OR EQUAL)
STEEL	W-SHAPES	ASTM A992 - FY = 50 KSI
	CHANNELS, ANGLES, PLATES	ASTM A36 - FY = 36 KSI
	HSS ROUND	ASTM A500 TYPE B - FY = 42 KSI
	HSS RECTANGULAR, SQUARE	ASTM A500 TYPE B - FY = 46 KSI
	STRUCTURAL STEEL PIPE	ASTM A53 TYPE E OR S GRADE B - FY = 35 KSI
	STRUCTURAL STEEL BOLTS	ASTM A325-N
	WASHERS	ASTM F436 HARDENED WASHER
	NUTS	ASTM A563
	WELDING ELECTRODES (E-70 SERIES)	ASTM A233
	GROUT BELOW PLATES	NON-SHRINK, NON-METALLIC (5000 PSI)
	ANCHOR RODS	ASTM F1554 GRADE 36 THREADED RODS (UNO)
	EPOXY BOLTS	EPOXY - HILTI HIT-RE 500-V3 INJECTABLE MORTAR
	HEADED STEEL STUDS	WITH THREADED RODS ASTM A108-GRADE 1010-1020, WELDED IN ACCORDANCE WITH CHAPER 7 OF ANSI/AWS D1.1
	THREADED RODS	ASTM A36 (UNO)
WOOD	DIMENSIONAL LUMBER (2" NOMINAL WIDTH)	DOULAS FIR-LARCH NO.2 UNO (19%) MAX MOISTURE CONTENT)
	DIMENSIONAL LUMBER (GREATER THAN 2" WIDTH)	DOUGLAS FIR-LARCH NO.1 UNO (19% MAX MOISTURE CONTENT)
	STUD LUMBER	HEM FIR NO. 2 STUD GRADE (19% MAX MOISTURE CONTENT)
	I-JOIST CHORDS	MIN. Fb = 1,700 PSI, Fv = 190 PSI, Fc, perp = 680 PSI
	LAMINATED VENEER LUMBER (LVL)	MIN. Fb = 2,600 PSI, Fv = 285 PSI, Fc, perp = 750 PSI, E = 1,900,000 PSI
	LAMINATED STRAND LUMBER (LSL)	STUDS: MIN. Fb = 1,700 PSI, Fv = 400 PSI, Fc,para = 1 ,400 PSI, E = 1,300,000 PSI BEAMS: MIN. Fb=2325 PSI, Fv=310 PSI, Fc,perp=900 PSI, E=1,550,000 PSI
	LAMINATED STRAND RIM MEMBERS (1 1/4" WIDE)	MIN. Fb = 1,700 PSI, Fv = 425 PSI, Fc,para = 1,835 PSI, E = 1,300,000 PSI
	ROOF TRUSS LUMBER	DOUGLAS FIR-LARCH OR SPRUCE-PINE-FIR NO.1 (MAX 19% MOISTURE CONTENT)
	BOLTS FOR WOOD CONSTRUCTION	ASTM A307
	TOP MOUNT HANGERS	SIMPSON HU-TF, B, OR IT (I-JOISTS) SERIES OR EQUIVALENT
	FACE MOUNT HANGERS	SIMPSON LU, HU, OR IU (I-JOISTS) SERIES OR EQUVALENT
	SHEATHING	APA RATED EXPOSURE 1, DOC PS1 OR PS2

SUBMITTALS

- THE APPROVAL OF THE STRUCTURAL ENGINEER OF RECORD MUST BE SECURED ON ALL STRUCTURAL SUBMITTALS.
- DO NOT REPRODUCE CONTRACT DOCUMENTS OR COPY STANDARD PRINTED INFORMATION AS THE BASIS OF SHOP DRAWINGS
- CONTRACTOR SHALL REVIEW AND STAMP ALL SHOP DRAWINGS PRIOR TO SUBMITTAL. ANY ITEMS NOT IN ACCORDANCE WITH THE CONTRACT DOCUMENTS SHALL BE FLAGGED BY THE CONTRACTOR.
- THE SHOP DRAWINGS DO NOT REPLACE THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL MAKE SURE THE STRUCTURE IS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
- ALL DIMENSIONS AND ELEVATIONS TO BE VERIFIED BY THE GENERAL CONTRACTOR IN ACCORDANCE W/ ALL CONTRACT DOCUMENTS.
- INCLUDE CALCULATIONS STAMPED AND SIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN JURISDICTION HAVING AUTHORITY OVER THE PROJECT FOR ALL DEFERRED SUBMITTAL ITEMS
- ALLOW A MINIMUM OF TWO WEEKS FOR ENGINEER REVIEW, PRIOR TO FABRICATION OR CONSTRUCTION.

CONCRETE	REINF SCHEDULE REINF ELEVATIONS STEEL EMBED DRAWINGS PRODUCT DATA CONCRETE MIX DESIGNS SUBMITTALS REQUIRED BY ACI 301
WOOD	FOREST STEWARDSHIP COUNCIL CERTIIFICATION HEAVY TIMBER LAYOUT
PRE-ENGINEERED WOOD	ROOF TRUSS LAYOUT FLOOR TRUSS LAYOUT DETAILS INCLUDING BRACING & HANGERS CONNECTION DETAILS
STRUCTURAL STEEL	SHOP DRAWINGS INCLUDING ANCHOR BOLT LAYOUT & DETAILS MILL CERTIFICATES WELDING CERTIFICATES SUBMITTALS REQUIRED BY AISC "MANUAL OF STEEL CONSTRUCTION" PROPER INSTALLATION OF SNUG-TIGHT OR SLIP-CRITICAL HIGH STRENGTH BOLTS PROPER INSTALLATION OF A325-X HIGH STRENGTH BOLTS

SPECIAL INSPECTION AND OBSERVATION STRUCTURAL ELEMENTS

- SPECIAL STRUCTURAL INSPECTIONS SHALL COMPLY WITH CHAPTER 17 OF THE INTERNATIONAL BUILDING CODE REFERENCED IN THESE DOCUMENTS.
- SPECIAL INSPECTOR SHALL BE EMPLOYED DIRECTLY BY THE OWNER.
- COORDINATE WITH ARCHITECTURAL AND MEP DRAWINGS FOR SPECIAL INSPECTIONS AND TESTING OF NON-STRUCTURAL ELEMENTS.
- TESTS AND INSPECTIONS SHALL COMPLY WITH THE REQUIREMENTS OF THE REFERENCED STANDARDS.
- SPECIAL STRUCTURAL INSPECTION IS REQUIRED IN ADDITION TO ANY INSPECTIONS REQUIRED BY THE JURISDICTION HAVING AUTHORITY OVER THE PROJECT SITE.
- SPECIAL STRUCTURAL INSPECTIONS SHALL BE PERFORMED ON, BUT ARE NOT LIMITED TO THE ITEMS INDICATED IN THE SPECIAL STRUCTURAL INSPECTION SCHEDULE.
- THE CONTRACTOR SHALL PROVIDE SAFE ACCESS TO ALL ITEMS REQUIRING SPECIAL STRUCTURAL INSPECTION.

DUTIES AND RESPONSIBILITIES OF THE SPECIAL STRUCTURAL INSPECTOR:

THE SPECIAL STRUCTURAL INSPECTOR:

- SHALL OBSERVE THE WORK ASSIGNED FOR CONFORMANCE TO THE APPROVED DESIGN DRAWINGS AND SPECIFICATIONS.
- SHALL REPORT TO THE CONTRACTOR UPON ARRIVING ON SITE TO DETERMINE WHETHER ANY DESIGN TEAM COMMUNICATIONS TO THE CONTRACTOR AFFECT THE WORK TO BE REVIEWED. THE SPECIAL STRUCTURAL INSPECTOR SHALL LEAVE A COPY OF EACH REPORT WITH THE CONTRACTOR UPON LEAVING SITE.
- SHALL FURNISH INSPECTION REPORTS TO THE BUILDING OFFICIAL, THE ENGINEER OR ARCHITECT OF RECORD, AND OTHER DESIGNATED PERSONS WITHIN 24 HOURS. ALL DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION, THEN, IF UNCORRECTED, TO THE PROPER DESIGN AUTHORITY AND TO THE BUILDING OFFICIAL.
- SHALL SUBMIT A FINAL SIGNED REPORT STATING WHETHER THE WORK REQUIRING SPECIAL INSPECTION WAS, TO THE BEST OF THE INSPECTOR'S KNOWLEDGE, IN CONFORMANCE TO THE APPROVED PLANS AND SPECIFICATIONS AND THE APPLICABLE WORKMANSHIP PROVISIONS OF THE CODE.
- IS NOT AUTHORIZED TO APPROVE ANY CHANGES TO THE CONTRACT DOCUMENTS. ANY VARIATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE CONTRACTOR AND ENGINEER OR ARCHITECT OF RECORD.

SPECIAL STRUCTURAL INSPECTION SCHEDULE

LEGEND:
C = CONTINUOUS SPECIAL INSPECTION
P = PERIODIC SPECIAL INSPECTION

STRUCTURAL STEEL	P	COMPLIANCE OF MATERIALS SPECIFIED
	P	COMPLIANCE OF INSTALLED CONNECTIONS TO CONSTRUCTION DOCUMENTS
	P	MANUFACTURER'S CERTIFIED TEST REPORTS
STRUCTURAL WELDING		NON-DESTRUCTIVELY TEST 100% GROOVE WELDS
		VISUALLY INSPECT ALL SHOP FABRICATION AND FIELD WELDS
		NON-DESTRUCTIVELY TEST 20% FILLET WELDS (IF NON SINGLE-PASS WELDS), IF MORE THAN 10% FAIL, TEST ALL FILLET WELDS
		VERIFY CURRENT WELDER'S CERTIFICATION
HIGH STRENGTH BOLTING		VERIFY SNUG TIGHT OR SLIP-CRITICAL INSTALLATIONS PER PLANS
		VERIFY INSTALLATION OF A325-N AND A490-N BOLTS PER PLAN
CONCRETE	P	VERIFY USE OF REQUIRED DESIGN MIX
	C	FABRICATE SPECIMEN FOR COMPRESSIVE STRENGTH TESTS
	C	PERFORM SLUMP, AIR CONTENT, AND TEMPERATURE TESTS
	P	REINFORCING STEEL SIZE AND POSITIONS PRIOR TO CONCRETE POUR
	C	SHEAR REINFORCEMENT
	P	INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED
	P	INSPECT ANCHOR RODS AND EMBED PLATES POSITION PRIOR TO CONCRETE POUR
	P	INSPECT ANCHORS POST-INSTALLED IN HARDENED CONCRETE
	P	PLACEMENT OF CONCRETE
	P	VERIFY WELDABILITY OF REINFORCING STEEL OTHER THAN ASTM A706
	P	INSPECT REINFORCING STEEL SINGLE-PASS FILLET WELDS UP TO 5/16"
	C	INSPECT ALL OTHER WELDS
	P	INSPECT ANCHORS CAST IN CONCRETE
	C	INSPECT ADHESIVE ANCHORS INSTALLED IN HORIZONTALLY OR UPWARDLY INCLINED ORIENTATIONS
	P	INSPECT MECHANICAL AND ADHESIVE ANCHORS
	P	PREPARATION, CONSTRUCTION AND PROTECTION OF CONCRETE DURING COLD OR HOT WEATHER
WOOD		FABRICATION PROCESSES OF WOOD STRUCTURAL ELEMENTS AND ASSEMBLIES
		TEMPORARY AND PERMANENT RESTRAINT/ BRACING OF METAL-PLATE-CONNECTED TRUSSES SPANNING MORE THAN 60 FEET
		FOR HIGH-LOAD DIAPHRAGMS: GRADE AND THICKNESS OF SHEATHING, NOMINAL SIZE OF FRAMING MEMBER AT ADJOINING PANEL FASTENER, SIZE, LENGTH SPACING
		FOR SHEAR WALLS: GRADE AND THICKNESS OF SHEATHING, NOMINAL SIZE OF FRAMING MEMBER AT ADJOINING PANEL, FASTENER SIZE, LENGTH, SPACING
SOILS	P	VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY
	P	VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTHS AND HAVE REACHED PROPER MATERIAL
	P	PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS
	C	VERIFY USE OF PROPER MATERIALS, DENSITIES, AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL
	P	PRIOR TO PLACEMENT OF COMPACTED FILL, INSPECT SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY
WIND RESISTING SYSTEM		WOOD SHEAR WALL AND DIAPHRAGM SYSTEMS:
EXP B & V asd ≥ 120 MPH	C	FIELD GLUING OF WOOD SHEATHING
EXP C & D & V asd ≥ 110 MPH	P	NAILING, BOLTING, ANCHORING OF WOOD ELEMENTS
	P	ROOF COVERING, DECK AND FRAMING CONNECTIONS
	P	EXTERIOR WALL COVERING AND CONNECTION TO ROOF AND FLOOR DIAPHRAGMS

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

Studio **NYL**
2995 Baseline Road, #314 303.558.3145
Boulder, Colorado 80303 www.studionyl.com
Boulder | Denver | Colorado Springs | Boston | Minneapolis

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21009

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

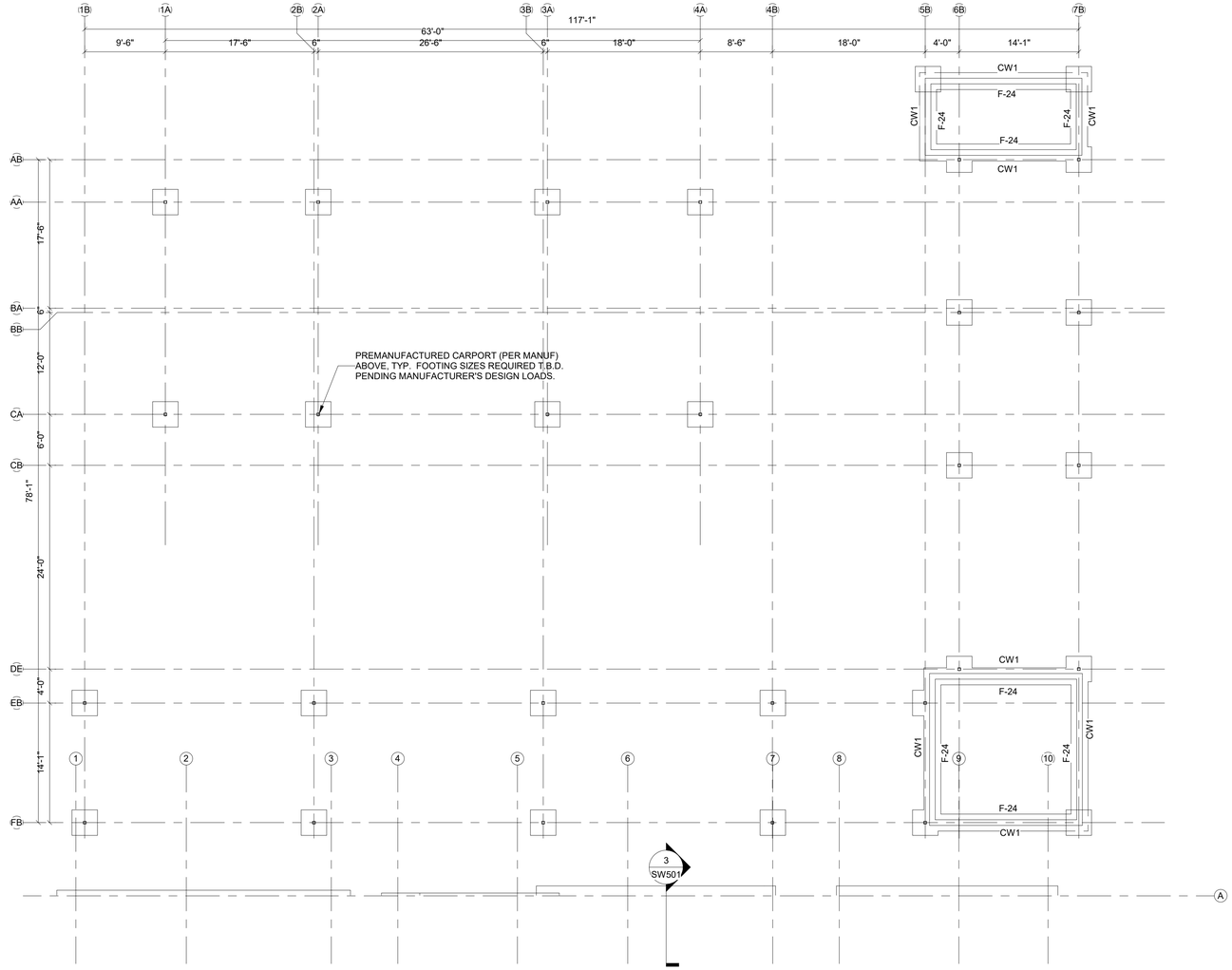
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

GENERAL NOTES

SC000

PLOT DATE: 3/18/2022 1:24:51 PM

COPYRIGHT©



CARPORT FOUNDATION PLAN
1/8" = 1'-0"

FOUNDATION PLAN NOTES

- REFER TO GENERAL STRUCTURAL NOTES FOR ADDITIONAL INFORMATION.
- VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS.
- VERIFY SITE DATUM WITH ARCHITECTS DRAWINGS.
- CONTRACTOR SHALL VERIFY ALL FIELD DIMENSIONS PRIOR TO CONSTRUCTION.
- DETAILS ARE NOT CUT AT EVERY LOCATION THEY OCCUR. IF A CONDITION IS UNCLEAR, CONTACT ARCHITECT IMMEDIATELY BEFORE PROCEEDING.
- COORDINATE ALL OPENINGS THROUGH STRUCTURAL MEMBERS W/ ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND CIVIL DRAWINGS. TRIM OPENINGS AS SHOWN ON PLANS.
- SEE MECH, ELECT, AND CIVIL DRAWINGS FOR SLEEVE LOCATIONS. PIPES, CONDUITS AND OTHER PENETRATIONS NOT SHOWN SHALL NOT PASS THROUGH MASONRY WALLS AND COLUMNS, CONCRETE WALLS, BEAMS AND COLUMNS OR STEEL BEAMS OR COLUMNS WITHOUT PRIOR APPROVAL FROM STRUCTURAL ENGINEER OF RECORD.
- REFER TO ARCHITECTURAL DRAWINGS FOR FIRE RATING AND UL DESIGN NUMBER.
- FOR MISCELLANEOUS STEEL NOT SHOWN ON PLANS, SEE GENERAL STRUCTURAL NOTES AND GRAPHICAL GENERAL NOTES
- PRELIMINARY ELEVATIONS SHOWN ARE BASED ON INFORMATION PROVIDED BY THE ARCHITECT AND ARE SUBJECT TO CHANGE.
- VERIFY EXACT LOCATION OF STEPS, RAMPS, DEPRESSED AND/OR RAISED AREAS OF SLAB-ON-GRADE WITH ARCHITECTURAL DRAWINGS.
- SLAB ON GRADE SHALL BE CONCRETE REINFORCED W/ 6x6-W2.1xW2.1 WWF UNO
- ALL CONCRETE WALL REINFORCING INDICATED ON PLAN SHALL BE FULL HEIGHT OF WALL UNO.
- ALL FOOTINGS TO BE CENTERED ON FOUNDATION WALLS UNO.
- FOR ANCHOR BOLT SPACING AND HOLD-DOWNS REQUIRED AT SHEAR WALLS, REFER TO FRAMING PLAN AND SHEARWALL SCHEDULE.

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

Studio **NYL**
2995 Baseline Road, #314 303.558.3145
Boulder, Colorado 80303 www.studionyl.com
Boulder | Denver | Colorado Springs | Boston | Minneapolis

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21009

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

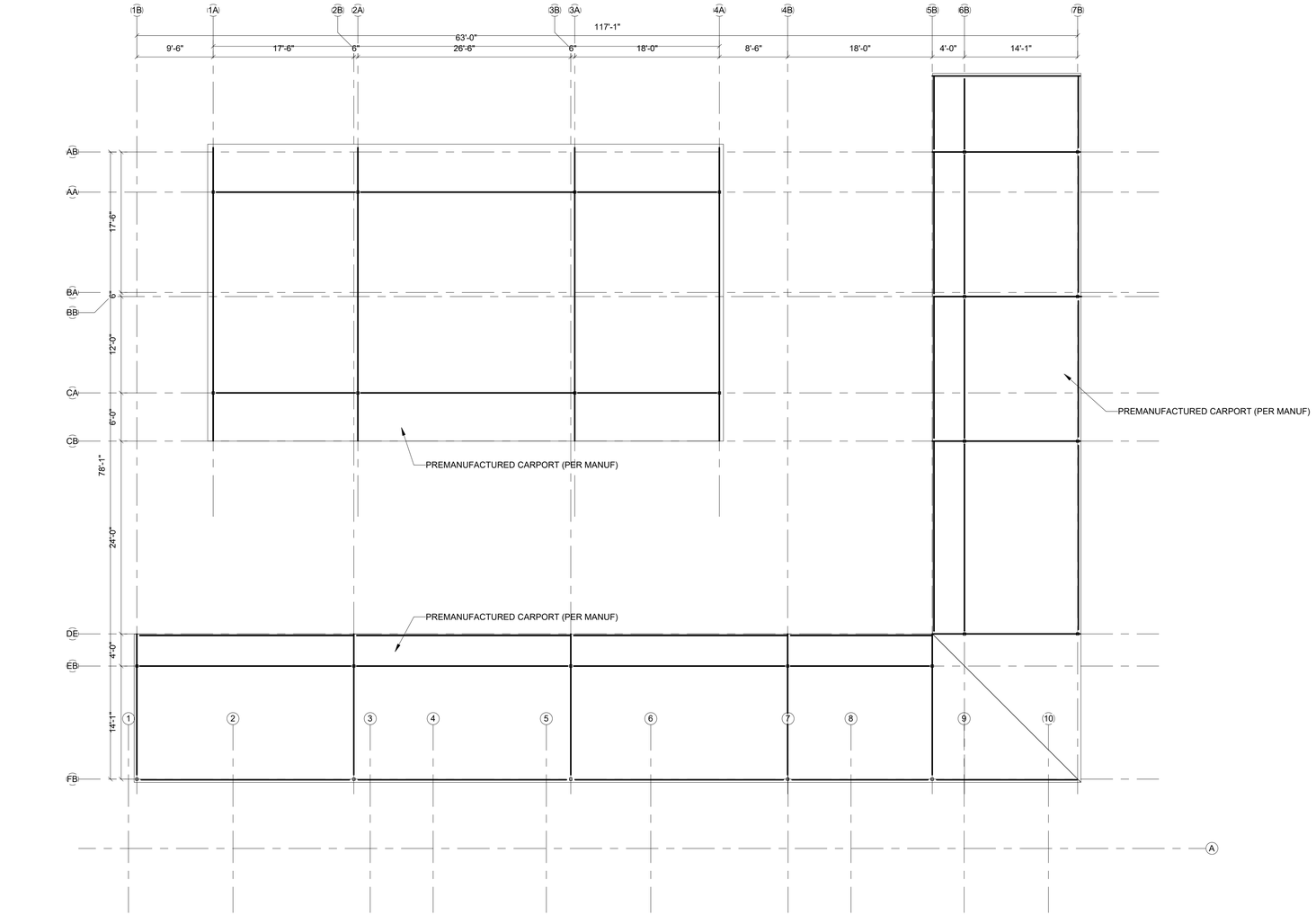
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

CARPORT FOUNDATION PLAN

SC101

COPYRIGHT©

PLOT DATE:3/18/2022 1:24:52 PM



1 CARPORT ROOF FRAMING PLAN
1/8" = 1'-0"

ROOF FRAMING PLAN NOTES

- REFER TO GENERAL STRUCTURAL NOTES FOR ADDITIONAL INFORMATION.
- VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS.
- VERIFY SITE DATUM WITH ARCHITECTS DRAWINGS.
- CONTRACTOR SHALL VERIFY ALL FIELD DIMENSIONS PRIOR TO CONSTRUCTION.
- DETAILS ARE NOT CUT AT EVERY LOCATION THEY OCCUR. IF A CONDITION IS UNCLEAR, CONTACT ARCHITECT IMMEDIATELY BEFORE PROCEEDING.
- COORDINATE ALL OPENINGS THROUGH STRUCTURAL MEMBERS W/ ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND CIVIL DRAWINGS. TRIM OPENINGS AS SHOWN ON PLANS.
- SEE MECH, ELECT, AND CIVIL DRAWINGS FOR SLEEVE LOCATIONS. PIPES, CONDUITS AND OTHER PENETRATIONS NOT SHOWN SHALL NOT PASS THROUGH MASONRY WALLS AND COLUMNS, CONCRETE WALLS, BEAMS AND COLUMNS OR STEEL BEAMS OR COLUMNS WITHOUT PRIOR APPROVAL FROM STRUCTURAL ENGINEER OF RECORD.
- REFER TO ARCHITECTURAL DRAWINGS FOR FIRE RATING AND UL DESIGN NUMBER.
- FOR MISCELLANEOUS STEEL NOT SHOWN ON PLANS, SEE GENERAL STRUCTURAL NOTES AND GRAPHICAL GENERAL NOTES
- PRELIMINARY ELEVATIONS SHOWN ARE BASED ON INFORMATION PROVIDED BY THE ARCHITECT AND ARE SUBJECT TO CHANGE.
- TOP OF STEEL IS NOTED THUS (###'-## ##/##").
- SHEARWALLS SHOWN ARE FROM LEVEL BELOW TO PLAN LEVEL.
- REFER TO GRAPHICAL GENERAL NOTES FOR HEADERS, BEARING STUDS (T, TRIMMER STUDS) AND WIND STUDS (KS, KING STUDS). PROVIDE MINIMUM (2) 2x TRIMMER STUDS UNDER EACH BEAM OR HEADER AND (2) 2x KING STUDS EACH END WHERE NOT NOTED ON PLAN.
- WALL STUDS SHALL BE PER STUD SCHEDULE ON PLAN.
- STEEL BEAM SHEAR CONN SHALL BE PER GGN ST-16 UNO
- ROOF SHEATHING SHALL BE 23/32" PLYWOOD OR O.S.B. (48/24 RATING) ATTACHED TO FRAMING W/ 0.148ø NAILS SPACED AT 4" OC ALONG ALL PANEL EDGES AND 12" OC IN THE FIELD, MIN 1-1/2" PEN INTO FRAMING (UNBLOCKED)

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

Studio **NYL**
2995 Baseline Road, #314 303.558.3145
Boulder, Colorado 80303 www.studionyl.com
Boulder | Denver | Colorado Springs | Boston | Minneapolis

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21009

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

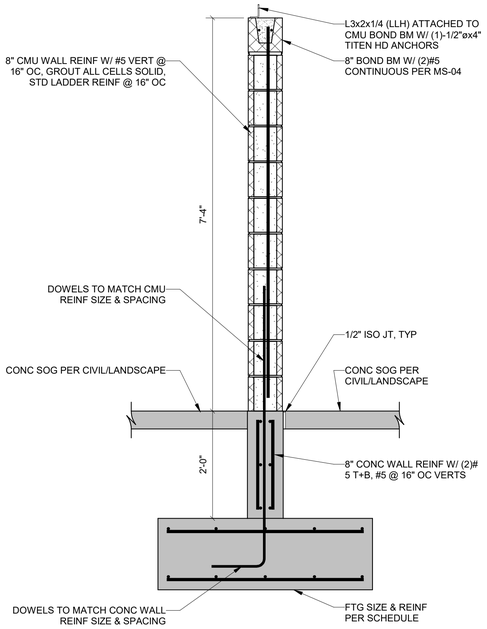
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

CARPORT ROOF PLAN

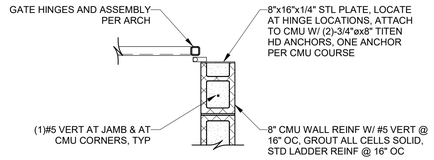
SC102

PLOT DATE: 3/18/2022 1:24:52 PM

COPYRIGHT©



1 SECTION
3/4" = 1'-0"



2 TRASH ENCLOSURE JAMB DETAIL
3/4" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

Studio **NYL**
2995 Baseline Road, #314 303.558.3145
Boulder, Colorado 80303 www.studionyl.com
Boulder | Denver | Colorado Springs | Boston | Minneapolis

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21009

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

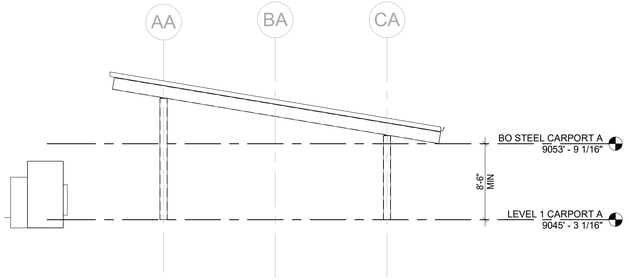
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

CARPORT
FOUNDATION DETAILS

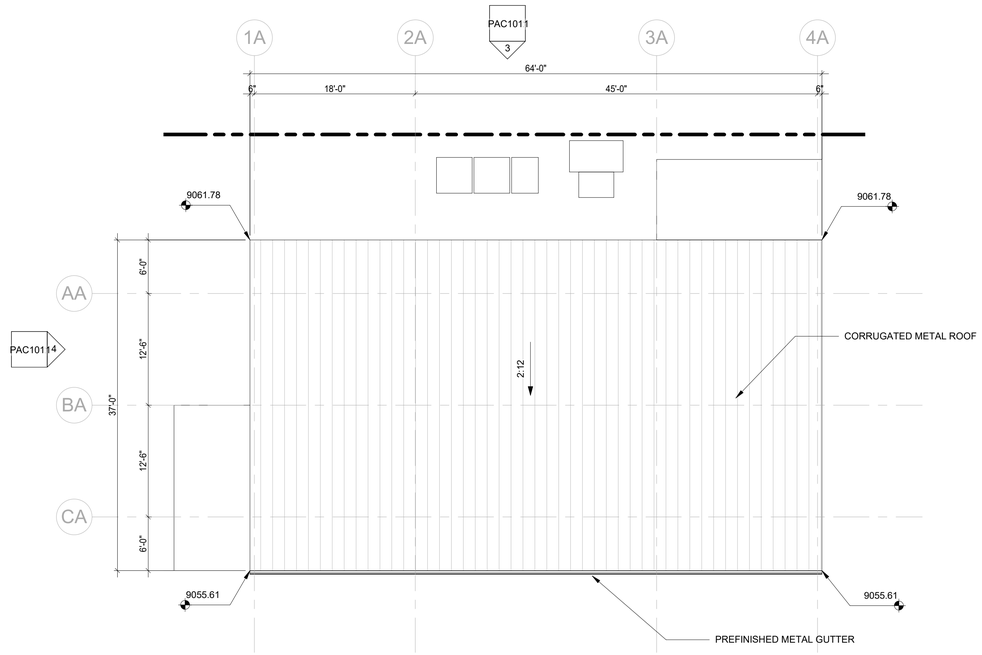
SC501

PLOT DATE: 3/18/2022 1:24:52 PM

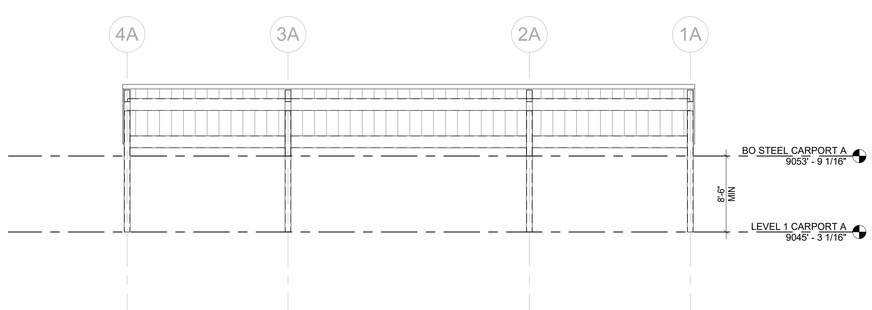
COPYRIGHT©



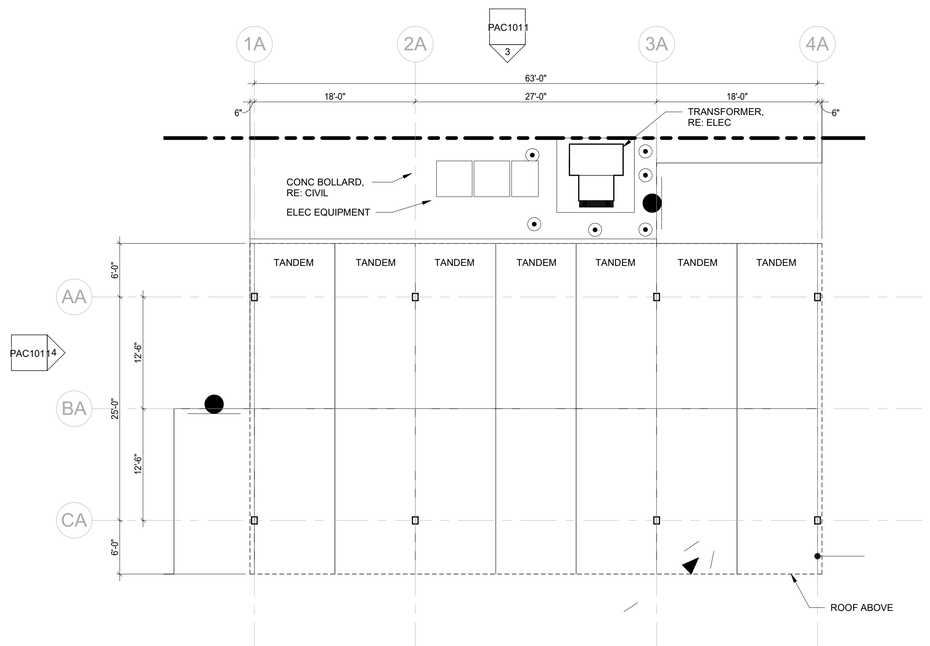
4 WEST ELEVATION - CARPORT A
1/8" = 1'-0"



2 ROOF PLAN - CARPORT A
1/8" = 1'-0"



3 NORTH ELEVATION - CARPORT A
1/8" = 1'-0"



1 LEVEL 1 PLAN - CARPORT A
1/8" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

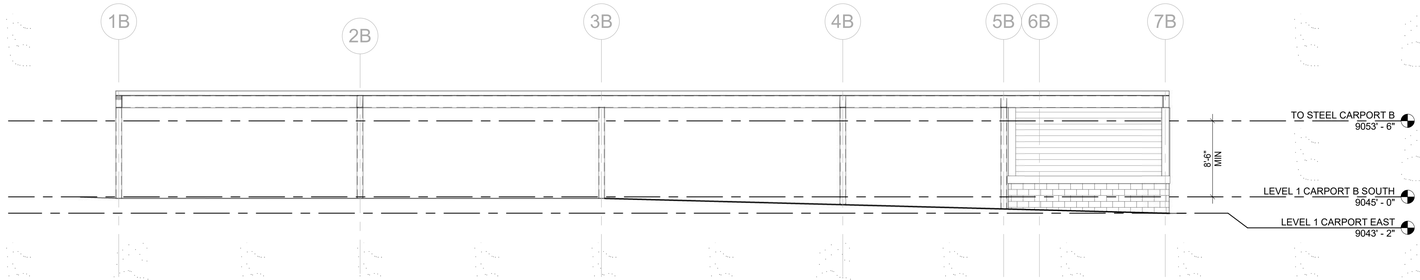
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

PLANS & ELEVATIONS - CARPORT A

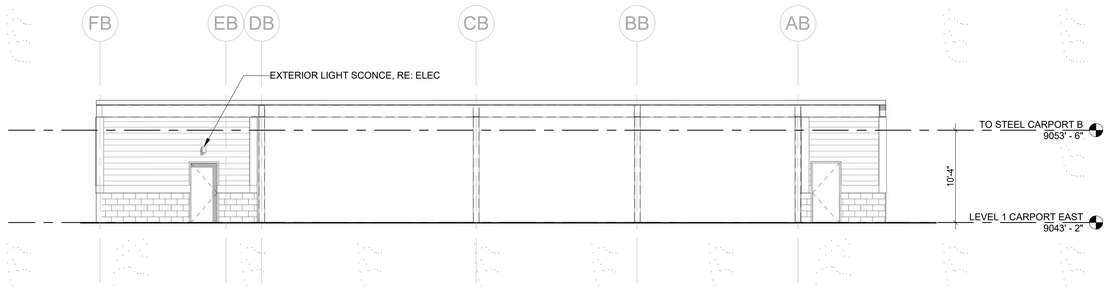
AC101

PLOT DATE: 3/28/2022 3:01:26 PM

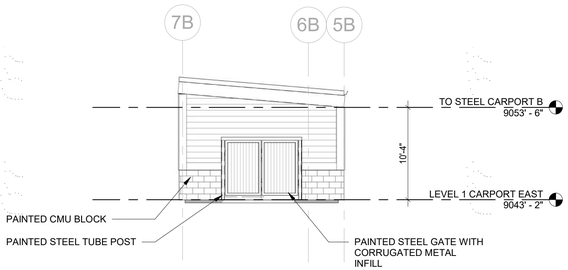
COPYRIGHT©



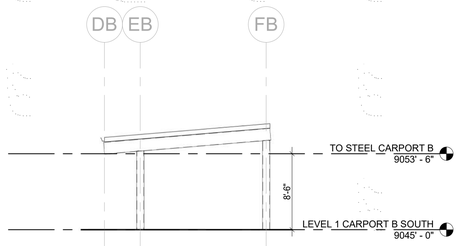
5 SOUTH ELEVATION - CARPORT B
1/8" = 1'-0"



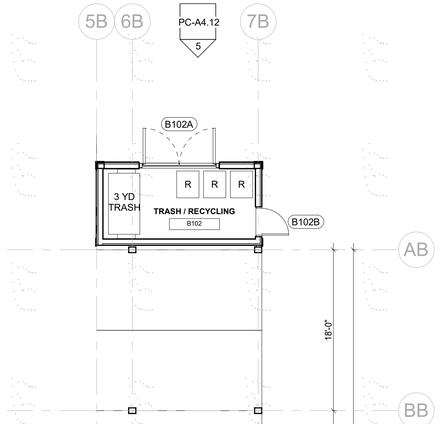
4 EAST ELEVATION - CARPORT B
1/8" = 1'-0"



3 NORTH ELEVATION - CARPORT B
1/8" = 1'-0"



2 WEST ELEVATION - CARPORT B
1/8" = 1'-0"



1 LEVEL 1 PLAN - CARPORT B
1/8" = 1'-0"

ELEVATION LEGEND

- BOARD AND BATTEN SIDING
- VERTICAL WOOD SIDING
- HORIZONTAL LAP SIDING
- VERTICAL CORRUGATED METAL
- ASPHALT SHINGLES
- STONE VENEER

KEYNOTES

KEY VALUE	KEYNOTE TEXT
26 50 00.A10	EXTERIOR LIGHT SCONCE, RE: ELEC

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

ARCHITECTURE STUDIO

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

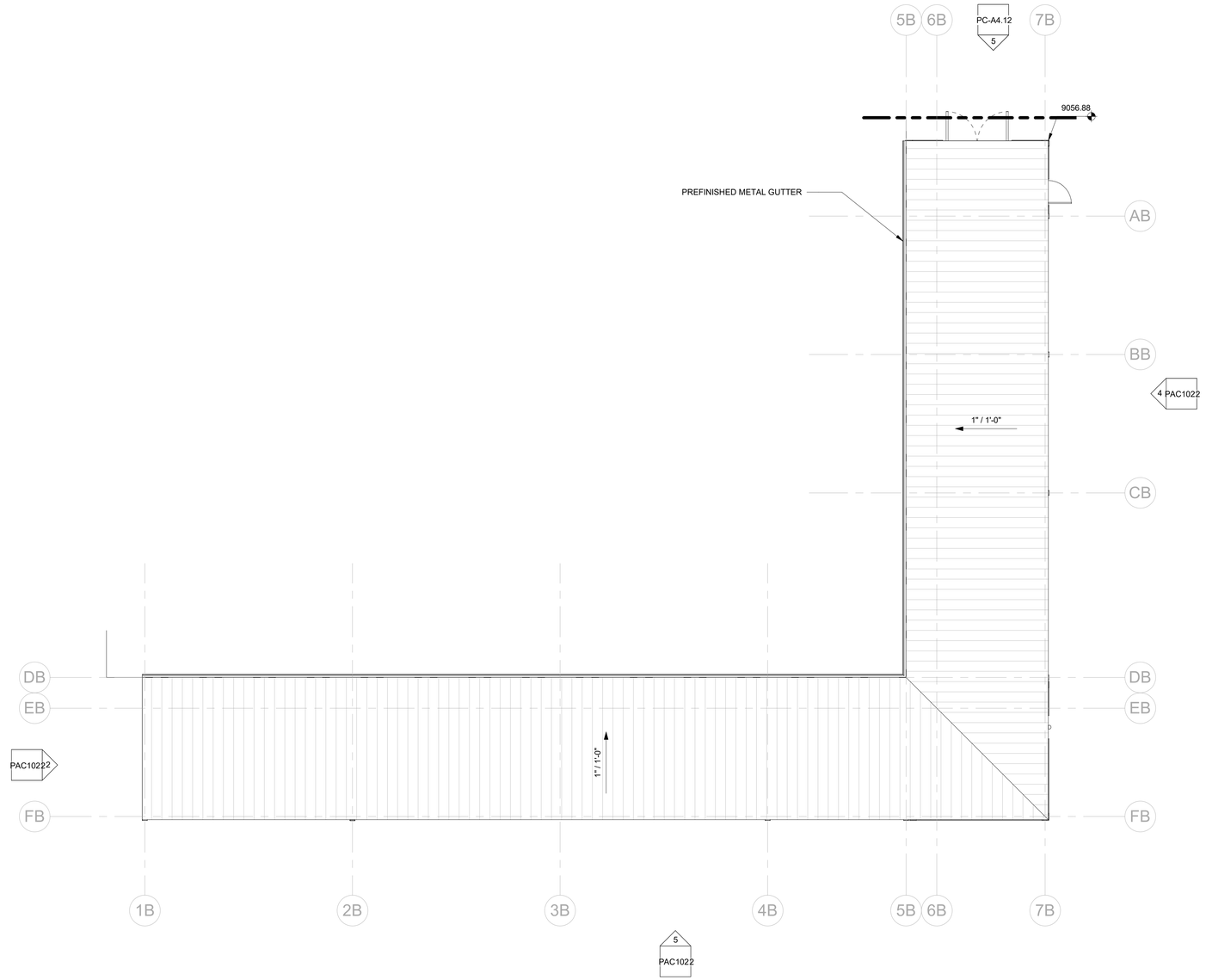
It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

FLOOR PLAN & ELEVATIONS - CARPORT B

AC102

PLOT DATE: 3/28/2022 3:01:28 PM

COPYRIGHT©



1/ ROOF PLAN - CARPORT B
1/8" = 1'-0"

STUDIO ARCHITECTURE
3575 RINGSBY CT, SUITE 300A
DENVER CO, 80216
theSTUDIOarchitecture.com
866.529.9130

GRANITE STREET WORKFORCE HOUSING

619 Granite St. Frisco, CO

THIS GRAPHIC EQUALS 0'-1"
DO NOT SCALE DRAWINGS

STUDIO Project No: 21-000.00

Sheet Issue & Revision Log

No	Date	Description
	03/25/22	BID SET

It is the client's responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or client's subcontractors proceeding with the work. The client shall be responsible for any defects in construction if these procedures are not followed.

ROOF PLAN - CARPORT B

AC103

PLOT DATE: 3/28/2022 3:01:30 PM

COPYRIGHT©

Granite Park Village

Frisco Colorado

BID SET

March 25, 2022

Project Manual

ARCHITECTURE STUDIO
3575 Ringsby Court Suite 300A
Denver, CO 80216

Specifications Division 01-48
Table of Contents

DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS
000107 Seals Page (Architect)

DIVISION 01 - GENERAL REQUIREMENTS
011000 Summary
012100 Allowances
012300 Alternates
012500 Substitution Procedures
012600 Contract Modification Procedures
012900 Payment Procedures
013100 Project Management and Coordination
013200 Construction Progress Documentation
013300 Submittal Procedures
014000 Quality Requirements
014200 References
014339 Mock-Ups
015000 Temporary Facilities and Controls
016000 Product Requirements
017300 Execution
017329 Cutting and Patching
017700 Closeout Procedures
017823 Operation and Maintenance Data
017839 Project Record Documents
017900 Demonstration and Training

DIVISION 02 – EXISTING CONDITIONS
Not Used

DIVISION 03 – CONCRETE
033000 Cast-in-Place Concrete
033520 Concrete Finishing
035413 Gypsum Cement Underlayment

DIVISION 04 - MASONRY
042000 Unit Masonry
047200 Cast Masonry Veneer

DIVISION 05 - METALS
055000 Metal Fabrications
055213 Pipe and Tube Railings

DIVISION 06 - WOOD AND PLASTICS
061000 Rough Carpentry
061600 Sheathing
061753 Shop Fabricated Wood Trusses
061800 Glue Laminated Construction
064013 Exterior Architectural Woodwork
064023 Interior Architectural Woodwork
064300 Wood Stairs and Railings

DIVISION 07 - THERMAL AND MOISTURE PROTECTION
071113 Bituminous Dampproofing
071900 Water Repellants
072100 Thermal Insulation
072726 Fluid Applied Membrane Air Barriers

073113 Asphalt Shingles
074213 Metal Panels
074625 Wood Siding
074646 Cementitious Paneling
076200 Sheet Metal Flashing and Trim
077200 Roof Accessories
078443 Joint Firestopping
079200 Joint Sealants

DIVISION 08 - DOORS AND WINDOWS
081113 Hollow Metal Doors and Frames
081416 Flush Wood Doors
083113 Access Doors and Frames
085213 Wood Clad Windows and Doors
085313 Vinyl Windows
087100 Door Hardware (to be provided later by consultant)

DIVISION 09 – FINISHES
092116 Gypsum Board Shaft Wall Assemblies
092900 Gypsum Board
093000 Tiling
096513 Resilient Wall Base and Accessories
096519 Resilient Flooring
096816 Sheet Carpeting
099113 Exterior Painting
099123 Interior Painting

DIVISION 10 - SPECIALTIES
101400 Signage
102800 Toilet and Bath Accessories
104416 Fire Extinguishers

DIVISION 11 - EQUIPMENT
113100 Residential Appliances

DIVISION 12 - FURNISHINGS
122113 Horizontal Louver Blinds
123530 Residential Casework
123661 Solid Surface Countertops

DIVISION 13 - SPECIAL CONSTRUCTION
Carports will be designed by others.

DIVISION 14 - CONVEYING SYSTEMS
Not Used

DIVISION 21 – FIRE SUPPRESSION
NFPA 13R System – Design by others**.**

DIVISION 23 – PLUMBING AND HEATING VENTILATING AND AIR CONDITIONING
See Drawings

DIVISION 26 – ELECTRICAL
See Drawings

END OF TABLE OF CONTENTS

SECTION 003132 - GEOTECHNICAL DATA

PART 1 - GENERAL

1.1 GEOTECHNICAL DATA

A. This Document with its referenced attachments is part of the Procurement and Contracting Requirements for Project. They provide Owner's information for Bidders' convenience and are intended to supplement rather than serve in lieu of Bidders' own investigations. They are made available for Bidders' convenience and information, but are not a warranty of existing conditions. This Document and its attachments are not part of the Contract Documents.

B. A geotechnical report is available upon request

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 003132

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Project information.
   2. Work covered by Contract Documents.
   3. Access to site.
   4. Work restrictions.
   5. Specification and drawing conventions.

B. Related Documents:
   1. Division 01 Section "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.2 PROJECT INFORMATION

A. Project Location: 619 Granite St, Frisco CO

B. Architect: STUDIO Architecture, 3575 Ringsby Court, Suite 300A, Denver, CO 80216

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and consists of the following:
   1. The construction of two 3-story buildings, carports and site improvements.

B. All environmental remediation shall be completed prior to the commencement of work.

C. Type of Contract.
   1. Project will be constructed under a single prime contract.

1.4 ACCESS TO SITE

A. General: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.

B. General: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.

C. Use of Site: Limit use of Project site to property line. Do not disturb portions of Project site beyond areas in which the Work is indicated.
   1. Limits: Limit site disturbance, including earthwork and clearing of vegetation, to 40 feet beyond building perimeter; 10 feet beyond surface walkways, patios, surface parking, and utilities less than 12 inches in diameter; 15 feet beyond primary roadway curbs and main utility branch trenches; and 25 feet beyond constructed areas with permeable surfaces (such as pervious paving areas, stormwater detention facilities, and playing fields) that require additional staging areas in order to limit compaction in the constructed area.

2. Driveways, Walkways and Entrances: Keep driveways parking garage, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
   a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
   b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

D. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

1.5 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.
1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.

B. On-Site Work Hours: Limit work in the existing building to normal business working hours of 7 a.m. to 6 p.m., Monday through Friday, unless otherwise indicated.
1. Comply with local jurisdiction’s additional requirements.

C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
1. Notify Architect and Owner’s Representative not less than two days in advance of proposed utility interruptions.
2. Obtain Architect's and Owner’s Representative written permission before proceeding with utility interruptions.

D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
1. Notify Architect and Owner’s Representative not less than two days in advance of proposed disruptive operations.
2. Obtain Architect and Owner’s Representative written permission before proceeding with disruptive operations.

E. Nonsmoking Building: Smoking is not permitted within the building or within 25 feet of entrances, operable windows, or outdoor-air intakes.

F. Controlled Substances: Use of tobacco products and other controlled substances on Project site is not permitted.

1.6 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
   1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
   2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
   3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 012100 - ALLOWANCES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements governing the following:
   1. Lump-sum allowances.
   2. Unit-cost allowances.
   3. Quantity allowances.
   4. Contingency allowances.
   5. Testing and inspecting allowances.

B. See Division 1 Section "Quality Requirements" for procedures governing the use of allowances for testing and inspecting.

1.2 SELECTION AND PURCHASE

A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.

B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

1.3 SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

B. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.4 COORDINATION

A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.5 LUMP-SUM ALLOWANCES

A. Allowance shall be the General Conditions to the Construction Contract.

B. Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner under allowance shall be included as part of the Contract Sum and not part of the allowance.

1.6 CONTINGENCY ALLOWANCES

A. Use the contingency allowance only as directed in the Conditions to the Contract.

1.7 TESTING AND INSPECTING ALLOWANCES

A. Testing and inspecting allowances include the cost of engaging testing agencies, actual tests and inspections, and reporting results.

B. The allowance does not include incidental labor required to assist the testing agency or costs for retesting if previous tests and inspections result in failure. The cost for incidental labor to assist the testing agency shall be included in the Contract Sum.

C. Costs of services not required by the Contract Documents are not included in the allowance.

D. At Project closeout, credit unused amounts remaining in the testing and inspecting allowance to Owner by Change Order.

1.8 UNUSED MATERIALS

A. Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
   1. If requested by Architect, prepare unused material for storage by Owner when it is not economically practical to return the material for credit. If directed by Architect, deliver unused material to Owner's storage space. Otherwise, disposal of unused material is Contractor's responsibility.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

A. As indicated on Drawings.

END OF SECTION 012100

SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for alternates.

1.2 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
   1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
   2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.3 PROCEDURES

A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
   1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.

C. Execute accepted alternates under the same conditions as other work of the Contract.

D. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Refer to Drawings

END OF SECTION 012300

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

B. Related Requirements:
1. Division 01 Section "Allowances" for products selected under an allowance.
2. Division 01 Section "Alternates" for products selected under an alternate.
3. Division 01 Section "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.
4. Divisions 02 through 33 Sections for specific requirements and limitations for substitutions.

1.2 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
2. Substitutions for Convenience: Shall be allowed as provided in the General Conditions of the Construction Contract.

1.3 ACTION SUBMITTALS

A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
1. Substitution Request Form: Use form as agreed upon.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable or requested.
f. Certificates and qualification data, where applicable or requested.
g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.

h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
k. Cost information, including a proposal of change, if any, in the Contract Sum.
l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
   a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
   b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.4 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.5 PROCEDURES

A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
   1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
      a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
      b. Substitution request is fully documented and properly submitted.
      c. Requested substitution will not adversely affect Contractor's construction schedule.
      d. Requested substitution has received necessary approvals of authorities having jurisdiction.
      e. Requested substitution is compatible with other portions of the Work.
      f. Requested substitution has been coordinated with other portions of the Work.

g. Requested substitution provides specified warranty.
h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

B. Substitutions for Convenience: Not allowed unless otherwise indicated.

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

B. Related Requirements:
   1. Division 01 Section "Substitution Procedures" for administrative procedures for handling requests for substitutions made after the Contract award.

1.2 MINOR CHANGES IN THE WORK

A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions."

1.3 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
   1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
   2. Within time specified in Proposal Request or 20 days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
   3. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
   4. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
   5. Include costs of labor and supervision directly attributable to the change.
   6. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
   7. Quotation Form: Use forms as agreed upon.

B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.
   1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
   2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
   3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
   4. Include costs of labor and supervision directly attributable to the change.
   5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

6. Comply with requirements in Division 01 Section "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
7. Proposal Request Form: Use forms as agreed upon.

1.4 ADMINISTRATIVE CHANGE ORDERS

A. Allowance Adjustment: See Division 01 Section "Allowances" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.

1.5 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Work Changes Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on forms as agreed upon.

1.6 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Architect may issue a Construction Work Change Directive on use forms as agreed upon. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
   1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
   1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.

B. Related Requirements:
1. Division 01 Section "Allowances" for procedural requirements governing the handling and processing of allowances.
2. Division 01 Section "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
3. Division 01 Section "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.2 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.3 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule. Cost-loaded Critical Path Method Schedule may serve to satisfy requirements for the schedule of values.
1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
    a. Application for Payment forms with continuation sheets.
    b. Submittal schedule.
    c. Items required to be indicated as separate activities in Contractor's construction schedule.
2. Submit the schedule of values to Architect at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.

B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
1. Identification: Include the following Project identification on the schedule of values:
    a. Project name and location.
    b. Name of Architect.
    c. Architect's project number.
    d. Contractor's name and address.
    e. Date of submittal.
2. Arrange schedule of values consistent with format of AIA Document G703.
3. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:
    a. Related Specification Section or Division.
    b. Description of the Work.
    c. Name of subcontractor.
    d. Name of manufacturer or fabricator.

e. Name of supplier.
f. Change Orders (numbers) that affect value.
g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
1) Labor.
2) Materials.
3) Equipment.

4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
6. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.
7. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
8. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
9. Purchase Contracts: Provide a separate line item in the schedule of values for each purchase contract. Show line-item value of purchase contract. Indicate owner payments or deposits, if any, and balance to be paid by Contractor.
10. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.
11. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.4 APPLICATIONS FOR PAYMENT

A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.

C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.

D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.

2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.

E. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
3. Provide summary documentation for stored materials indicating the following:
    a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
    b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
    c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.

F. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
2. When an application shows completion of an item, submit conditional final or full waivers.
3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
5. Waiver Forms: Submit executed waivers of lien on forms, acceptable to Owner.

H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
2. Schedule of values.
3. Contractor's construction schedule (preliminary if not final).
4. Products list (preliminary if not final).
5. Schedule of unit prices.
6. Submittal schedule (preliminary if not final).
7. List of Contractor's staff assignments.
8. List of Contractor's principal consultants.
9. Copies of building permits.
10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.

11. Initial progress report.
12. Report of preconstruction conference.
13. Certificates of insurance and insurance policies.
14. Performance and payment bonds.
15. Data needed to acquire Owner's insurance.

I. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
   1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
   2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

J. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
   1. Evidence of completion of Project closeout requirements.
   2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
   3. Updated final statement, accounting for final changes to the Contract Sum.
   4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
   5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
   6. AIA Document G707, "Consent of Surety to Final Payment."
   7. Evidence that claims have been settled.
   8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
   9. Final liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
   1. General coordination procedures.
   2. Coordination drawings.
   3. Requests for Information (RFIs).
   4. Project Web site.
   5. Project meetings.

B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.

C. Related Requirements:
   1. Division 01 Section "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
   2. Division 01 Section "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
   3. Division 01 Section "Closeout Procedures" for coordinating closeout of the Contract.

1.2 DEFINITIONS

A. RFI: Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.3 INFORMATIONAL SUBMITTALS

A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Use CSI Form as agreed upon. Include the following information in tabular form:
   1. Name, address, and telephone number of entity performing subcontract or supplying products.
   2. Number and title of related Specification Section(s) covered by subcontract.
   3. Drawing number and detail references, as appropriate, covered by subcontract.

B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
   1. Post copies of list in project meeting room, in temporary field office, on Project Web site, and by each temporary telephone. Keep list current at all times.

1.4 GENERAL COORDINATION PROCEDURES

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations,

included in different Sections, that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's construction schedule.
2. Preparation of the schedule of values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.

D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

1.5 COORDINATION DRAWINGS

A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.

1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
    a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
    b. Coordinate the addition of trade-specific information to the coordination drawings by multiple contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
    c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
    d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
    e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.

f. Indicate required installation sequences.
g. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

B. Coordination Drawing Organization: Organize coordination drawings as follows:
1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
6. Mechanical and Plumbing Work: Show the following:
   a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
   b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
   c. Fire-rated enclosures around ductwork.
7. Electrical Work: Show the following:
   a. Runs of vertical and horizontal conduit 1-1/4 inches in diameter and larger.
   b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
   c. Panel board, switch board, switchgear, transformer, busway, generator, and motor control center locations.
   d. Location of pull boxes and junction boxes, dimensioned from column center lines.
8. Fire-Protection System: Show the following:
   a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
9. Review: Architect will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make changes as directed and resubmit.
10. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Division 01 Section "Submittal Procedures."

C. Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:
1. File Preparation Format: Same digital data software program, version, and operating system as original Drawings.
2. File Submittal Format: Submit or post coordination drawing files using Portable Data File (PDF) format.
3. BIM File Incorporation: Develop and incorporate coordination drawing files into Building Information Model established for Project.

a. Perform three-dimensional component conflict analysis as part of preparation of coordination drawings. Resolve component conflicts prior to submittal. Indicate where conflict resolution requires modification of design requirements by Architect.

4. Architect will furnish Contractor one set of digital data files of Drawings for use in preparing coordination digital data files.
   a. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Drawings.
   b. Digital Data Software Program: Drawings are available in version as agreed upon.
   c. Contractor shall execute a data licensing agreement in the form of Agreement included in this Project Manual.

1.6 REQUESTS FOR INFORMATION (RFIs)

A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
   1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
   2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
   1. Project name.
   2. Project number.
   3. Date.
   4. Name of Contractor.
   5. Name of Architect.
   6. RFI number, numbered sequentially.
   7. RFI subject.
   8. Specification Section number and title and related paragraphs, as appropriate.
   9. Drawing number and detail references, as appropriate.
   10. Field dimensions and conditions, as appropriate.
   11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
   12. Contractor's signature.
   13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
      a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

C. RFI Forms: As agreed upon.
   1. Attachments shall be electronic files in Adobe Acrobat PDF format.

D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
   1. The following Contractor-generated RFIs will be returned without action:
      a. Requests for approval of submittals.
      b. Requests for approval of substitutions.
      c. Requests for approval of Contractor's means and methods.
      d. Requests for coordination information already indicated in the Contract Documents.
      e. Requests for adjustments in the Contract Time or the Contract Sum.
      f. Requests for interpretation of Architect's actions on submittals.

g. Incomplete RFIs or inaccurately prepared RFIs.

2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 01 Section "Contract Modification Procedures."
   a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.

E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Include the following:
1. Project name.
2. Name and address of Contractor.
3. Name and address of Architect.
4. RFI number including RFIs that were returned without action or withdrawn.
5. RFI description.
6. Date the RFI was submitted.
7. Date Architect's response was received.

F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.
1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

1.7 PROJECT WEB SITE

A. Provide, administer, and use Project Web site for purposes of hosting and managing project communication and documentation until Final Completion. Project Web site shall include the following functions:
1. Project directory.
2. Project correspondence.
3. Meeting minutes.
4. Contract modifications forms and logs.
5. RFI forms and logs.
6. Task and issue management.
7. Photo documentation.
8. Schedule and calendar management.
9. Submittals forms and logs.
10. Payment application forms.
11. Drawing and specification document hosting, viewing, and updating.
12. Online document collaboration.
13. Reminder and tracking functions.
14. Archiving functions.

B. Provide up to five shared Project management web site user licenses for use by the Owner, Owner’s Commissioning Authority, Architect and Architect’s Consultant. Provide eight hours of software training at Contractor’s office for Project Management Web site users.

C. On completion of Project, provide one complete archive copy(ies) of Project Web site files to Owner and to Architect in a digital storage format acceptable to Architect.

D. Contractor, subcontractors, and other parties granted access by Contractor to Project Web site shall execute a data licensing agreement in the form of Agreement acceptable to Owner and Architect.

1.8 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
   1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
   2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
   3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner, and Architect, within three days of the meeting.

B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.
   1. Conduct the conference to review responsibilities and personnel assignments.
   2. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
   3. Agenda: Discuss items of significance that could affect progress, including the following:
      a. Tentative construction schedule.
      b. Phasing.
      c. Critical work sequencing and long-lead items.
      d. Designation of key personnel and their duties.
      e. Lines of communications.
      f. Procedures for processing field decisions and Change Orders.
      g. Procedures for RFIs.
      h. Procedures for testing and inspecting.
      i. Procedures for processing Applications for Payment.
      j. Distribution of the Contract Documents.
      k. Submittal procedures.
      l. Preparation of record documents.
      m. Use of the premises.
      n. Work restrictions.
      o. Working hours.
      p. Owner's occupancy requirements.
      q. Responsibility for temporary facilities and controls.
      r. Procedures for moisture and mold control.
      s. Procedures for disruptions and shutdowns.
      t. Construction waste management and recycling.
      u. Parking availability.
      v. Office, work, and storage areas.
      w. Equipment deliveries and priorities.
      x. First aid.
      y. Security.
      z. Progress cleaning.
   4. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
   1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect and Owner's Commissioning Authority of scheduled meeting dates.

2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
    a. Contract Documents.
    b. Options.
    c. Related RFIs.
    d. Related Change Orders.
    e. Purchases.
    f. Deliveries.
    g. Submittals.
    h. Review of mockups.
    i. Possible conflicts.
    j. Compatibility requirements.
    k. Time schedules.
    l. Weather limitations.
    m. Manufacturer's written instructions.
    n. Warranty requirements.
    o. Compatibility of materials.
    p. Acceptability of substrates.
    q. Temporary facilities and controls.
    r. Space and access limitations.
    s. Regulations of authorities having jurisdiction.
    t. Testing and inspecting requirements.
    u. Installation procedures.
    v. Coordination with other work.
    w. Required performance results.
    x. Protection of adjacent work.
    y. Protection of construction and personnel.
3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than 90 days prior to the scheduled date of Substantial Completion.
1. Conduct the conference to review requirements and responsibilities related to Project closeout.
2. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
    a. Preparation of record documents.
    b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
    c. Submittal of written warranties.
    d. Requirements for preparing operations and maintenance data.
    e. Requirements for delivery of material samples, attic stock, and spare parts.
    f. Requirements for demonstration and training.
    g. Preparation of Contractor's punch list.
    h. Procedures for processing Applications for Payment at Substantial Completion and for final payment.

i. Submittal procedures.
j. Coordination of separate contracts.
k. Owner's partial occupancy requirements.
l. Installation of Owner's furniture, fixtures, and equipment.
m. Responsibility for removing temporary facilities and controls.

4. Minutes: Entity conducting meeting will record and distribute meeting minutes.

E. Progress Meetings: Conduct progress meetings at weekly intervals.
1. Coordinate dates of meetings with preparation of payment requests.
2. Attendees: In addition to representatives of Owner, Owner's Commissioning Authority and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
   a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
      1) Review schedule for next period.
   b. Review present and future needs of each entity present, including the following:
      1) Interface requirements.
      2) Sequence of operations.
      3) Resolution of BIM component conflicts.
      4) Status of submittals.
      5) Deliveries.
      6) Off-site fabrication.
      7) Access.
      8) Site utilization.
      9) Temporary facilities and controls.
      10) Progress cleaning.
      11) Quality and work standards.
      12) Status of correction of deficient items.
      13) Field observations.
      14) Status of RFIs.
      15) Status of proposal requests.
      16) Pending changes.
      17) Status of Change Orders.
      18) Pending claims and disputes.
      19) Documentation of information for payment requests.
4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
   a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

F. Coordination Meetings: Conduct Project coordination meetings at weekly intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.

1. Attendees: In addition to representatives of Owner, Owner's Commissioning Authority and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meetings shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
    a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
    b. Schedule Updating: Revise combined Contractor's construction schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
    c. Review present and future needs of each contractor present, including the following:
        1) Interface requirements.
        2) Sequence of operations.
        3) Resolution of BIM component conflicts.
        4) Status of submittals.
        5) Deliveries.
        6) Off-site fabrication.
        7) Access.
        8) Site utilization.
        9) Temporary facilities and controls.
        10) Work hours.
        11) Hazards and risks.
        12) Progress cleaning.
        13) Quality and work standards.
        14) Change Orders.
        15) Indoor Air Quality issues
3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
   1. Startup construction schedule.
   2. Contractor's construction schedule.
   3. Construction schedule updating reports.
   4. Daily construction reports.
   5. Material location reports.
   6. Site condition reports.
   7. Special reports.

B. Related Requirements:
   1. Division 01 Section "Submittal Procedures" for submitting schedules and reports.
   2. Division 01 Section "Quality Requirements" for submitting a schedule of tests and inspections.

1.2 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
   1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
   2. Predecessor Activity: An activity that precedes another activity in the network.
   3. Successor Activity: An activity that follows another activity in the network.

B. Cost Loading: The allocation of the schedule of values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum unless otherwise approved by Architect.

C. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

D. Event: The starting or ending point of an activity.

E. Float: The measure of leeway in starting and completing an activity.
   1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
   2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
   3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

F. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.3 INFORMATIONAL SUBMITTALS

A. Format for Submittals: Submit required submittals in the following format:
   1. PDF electronic file.

B. Startup construction schedule.
   1. Approval of cost-loaded, startup construction schedule will not constitute approval of schedule of values for cost-loaded activities.

C. Startup Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.

D. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

E. Construction Schedule Updating Reports: Submit with Applications for Payment.

F. Daily Construction Reports: Submit at intervals as agreed upon

G. Material Location Reports: Submit at intervals as agreed upon

H. Site Condition Reports: Submit at time of discovery of differing conditions.

I. Special Reports: Submit at time of unusual event.

J. Qualification Data: For scheduling consultant.

1.4 QUALITY ASSURANCE

A. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to the preliminary construction schedule and Contractor's construction schedule, including, but not limited to, the following:
   1. Review software limitations and content and format for reports.
   2. Verify availability of qualified personnel needed to develop and update schedule.
   3. Discuss constraints, including phasing work stages area separations interim milestones and partial Owner occupancy.
   4. Review delivery dates for Owner-furnished products.
   5. Review schedule for work of Owner's separate contracts.
   6. Review submittal requirements and procedures.
   7. Review time required for review of submittals and resubmittals.
   8. Review requirements for tests and inspections by independent testing and inspecting agencies.
   9. Review time required for Project closeout and Owner startup procedures.
   10. Review and finalize list of construction activities to be included in schedule.
   11. Review procedures for updating schedule.

1.5 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

B. Coordinate Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from entities involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Time Frame: Extend schedule from date established for the Notice to Proceed to date of final completion.
   1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

B. Activities: Treat each story or separate area as a separate numbered activity for each main element of the Work. Comply with the following:
   1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
   2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
      a. Elevator
      b. Phenolic Panels
   3. Submittal Review Time: Include review and resubmittal times indicated in Division 01 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
   4. Startup and Testing Time: Include no fewer than 15 days for startup and testing.
   5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
   6. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and final completion.

C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
   1. Phasing: Arrange list of activities on schedule by phase.
   2. Work under More Than One Contract: Include a separate activity for each contract.
   3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
   4. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Division 01 Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
   5. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Division 01 Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
   6. Work Restrictions: Show the effect of the following items on the schedule:
      a. Coordination with existing construction.
      b. Limitations of continued occupancies.
      c. Uninterruptible services.
      d. Partial occupancy before Substantial Completion.
      e. Use of premises restrictions.
      f. Provisions for future construction.
      g. Seasonal variations.
      h. Environmental control.

7. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
   a. Subcontract awards.
   b. Submittals.
   c. Purchases.
   d. Mockups.
   e. Fabrication.
   f. Sample testing.
   g. Deliveries.
   h. Installation.
   i. Tests and inspections.
   j. Adjusting.
   k. Curing.
   l. Building flush-out.
   m. Startup and placement into final use and operation.
8. Construction Areas: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
   a. Structural completion.
   b. Temporary enclosure and space conditioning.
   c. Permanent space enclosure.
   d. Completion of mechanical installation.
   e. Completion of electrical installation.
   f. Substantial Completion.

D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion.

E. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
   1. Unresolved issues.
   2. Unanswered Requests for Information.
   3. Rejected or unreturned submittals.
   4. Notations on returned submittals.
   5. Pending modifications affecting the Work and Contract Time.

F. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery will be accomplished.

G. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

2.2 STARTUP CONSTRUCTION SCHEDULE

A. Bar-Chart Schedule: Submit startup, horizontal, bar-chart-type construction schedule within seven days of date established for the Notice to Proceed.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 90 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

2.3 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
   1. List of subcontractors at Project site.
   2. List of separate contractors at Project site.
   3. Approximate count of personnel at Project site.
   4. Equipment at Project site.
   5. Material deliveries.
   6. High and low temperatures and general weather conditions, including presence of rain or snow.
   7. Accidents.
   8. Meetings and significant decisions.
   9. Unusual events (see special reports).
   10. Stoppages, delays, shortages, and losses.
   11. Meter readings and similar recordings.
   12. Emergency procedures.
   13. Orders and requests of authorities having jurisdiction.
   14. Change Orders received and implemented.
   15. Construction Change Directives received and implemented.
   16. Services connected and disconnected.
   17. Equipment or system tests and startups.
   18. Partial completions and occupancies.
   19. Substantial Completions authorized.

B. Material Location Reports: At weekly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site. Indicate the following categories for stored materials:
   1. Material stored prior to previous report and remaining in storage.
   2. Material stored prior to previous report and since removed from storage and installed.
   3. Material stored following previous report and remaining in storage.

C. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.4 SPECIAL REPORTS

A. General: Submit special reports directly to Owner within one <Insert number> day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.

B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
   1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
   2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
   3. As the Work progresses, indicate final completion percentage for each activity.

B. Distribution: Distribute copies of approved schedule to Architect, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
   1. Post copies in Project meeting rooms and temporary field offices.
   2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 013200

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

B. Refer to the General Conditions of the Contract to the Construction Contract, Article 2.1 for additional requirements related to the submittal processing.

C. Related Requirements:
1. Division 01 Section "Payment Procedures" for submitting Applications for Payment and the schedule of values.
2. Division 01 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
3. Division 01 Section "Operation and Maintenance Data" for submitting operation and maintenance manuals.
4. Division 01 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
5. Division 01 Section "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

1.2 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."

B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.

D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.3 ACTION SUBMITTALS

A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to

submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.

1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
    a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.
4. Format: Arrange the following information in a tabular format:
    a. Scheduled date for first submittal.
    b. Specification Section number and title.
    c. Submittal category: Action; informational.
    d. Name of subcontractor.
    e. Description of the Work covered.
    f. Scheduled date for Architect's final release or approval.
    g. Scheduled date of fabrication.
    h. Scheduled dates for purchasing.
    i. Scheduled dates for installation.
    j. Activity or event number.

1.4 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

A. Architect's Digital Data Files: Electronic digital data files of the Contract Drawings will be provided by Architect for Contractor's use in preparing submittals.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
3. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
    a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow 15 days for review of each resubmittal.
4. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 15 days for review of each submittal. Submittal will be returned to Architect, before being returned to Contractor.

D. Paper Submittals: Place a permanent label or title block on each submittal item for identification.
   1. Indicate name of firm or entity that prepared each submittal on label or title block.
   2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
   3. Include the following information for processing and recording action taken:
      a. Project name.
      b. Date.
      c. Name of Architect.
      d. Name of Construction Manager.
      e. Name of Contractor.
      f. Name of subcontractor.
      g. Name of supplier.
      h. Name of manufacturer.
      i. Submittal number or other unique identifier, including revision identifier.
         1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
      j. Number and title of appropriate Specification Section.
      k. Drawing number and detail references, as appropriate.
      l. Location(s) where product is to be installed, as appropriate.
      m. Other necessary identification.
   4. Transmittal for Paper Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return without review submittals received from sources other than Contractor.
      a. Transmittal Form for Paper Submittals: Use form as agreed upon.
      b. Transmittal Form for Paper Submittals: Provide locations on form for the following information:
         1) Project name.
         2) Date.
         3) Destination (To:).
         4) Source (From:).
         5) Name and address of Architect.
         6) Name of Construction Manager.
         7) Name of Contractor.
         8) Name of firm or entity that prepared submittal.
         9) Names of subcontractor, manufacturer, and supplier.
         10) Category and type of submittal.
         11) Submittal purpose and description.
         12) Specification Section number and title.
         13) Specification paragraph number or drawing designation and generic name for each of multiple items.
         14) Drawing number and detail references, as appropriate.
         15) Indication of full or partial submittal.
         16) Transmittal number, numbered consecutively.
         17) Submittal and transmittal distribution record.
         18) Remarks.
         19) Signature of transmitter.

E. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
   1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
   2. Name file with submittal number or other unique identifier, including revision identifier.

a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).

3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
4. Transmittal Form for Electronic Submittals: Use electronic form acceptable to Owner, containing the following information:
   a. Project name.
   b. Date.
   c. Name and address of Architect.
   d. Name of Construction Manager.
   e. Name of Contractor.
   f. Name of firm or entity that prepared submittal.
   g. Names of subcontractor, manufacturer, and supplier.
   h. Category and type of submittal.
   i. Submittal purpose and description.
   j. Specification Section number and title.
   k. Specification paragraph number or drawing designation and generic name for each of multiple items.
   l. Drawing number and detail references, as appropriate.
   m. Location(s) where product is to be installed, as appropriate.
   n. Related physical samples submitted directly.
   o. Indication of full or partial submittal.
   p. Transmittal number, numbered consecutively.
   q. Submittal and transmittal distribution record.
   r. Other necessary identification.
   s. Remarks.
5. Metadata: Include the following information as keywords in the electronic submittal file metadata:
   a. Project name.
   b. Number and title of appropriate Specification Section.
   c. Manufacturer name.
   d. Product name.

F. Options: Identify options requiring selection by Architect.

G. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.

H. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
   1. Note date and content of previous submittal.
   2. Note date and content of revision in label or title block and clearly indicate extent of revision.
   3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.

I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

J. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
   1. Post electronic submittals as PDF electronic files directly to Project Web site specifically established for Project.
      a. Architect, will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
   2. Action Submittals: Submit three paper copies of each submittal unless otherwise indicated. Architect, will return two copies.
   3. Informational Submittals: Submit two paper copies of each submittal unless otherwise indicated. Architect will not return copies.
   4. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
      a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
      b. Provide a notarized statement on original paper copy certificates and certifications where indicated.

A. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

B. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
   1. Mark each copy of each submittal to show which products and options are applicable.
   2. Include the following information, as applicable:
      a. Manufacturer's catalog cuts.
      b. Manufacturer's product specifications.
      c. Standard color charts.
      d. Statement of compliance with specified referenced standards.
      e. Testing by recognized testing agency.
      f. Application of testing agency labels and seals.
      g. Notation of coordination requirements.
      h. Availability and delivery time information.
   3. For equipment, include the following in addition to the above, as applicable:
      a. Wiring diagrams showing factory-installed wiring.
      b. Printed performance curves.
      c. Operational range diagrams.
      d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
   4. Submit Product Data before or concurrent with Samples.
   5. Submit Product Data in the following format:
      a. PDF electronic file.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal based on Architect's digital data drawing files is otherwise permitted.
   1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
      a. Identification of products.
      b. Schedules.

c. Compliance with specified standards.
d. Notation of coordination requirements.
e. Notation of dimensions established by field measurement.
f. Relationship and attachment to adjoining construction clearly indicated.
g. Seal and signature of professional engineer if specified.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches, but no larger than 30 by 42 inches
3. Submit Shop Drawings in the following format:
   a. PDF electronic file.

D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Attach label on unexposed side of Samples that includes the following:
   a. Generic description of Sample.
   b. Product name and name of manufacturer.
   c. Sample source.
   d. Number and title of applicable Specification Section.
   e. Specification paragraph number and generic name of each item.
3. For projects where electronic submittals are required, provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.
4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
   a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
   b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
   a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect, will return submittal with options selected. Electronic samples will not be acceptable for initial selection of color or textures.
6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
   a. Number of Samples: Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a project record sample. Electronic samples will not be acceptable for verification of color or textures.
      1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
      2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
   1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
   2. Manufacturer and product name, and model number if applicable.
   3. Number and name of room or space.
   4. Location within room or space.
   5. Submit product schedule in the following format:
      a. PDF electronic file.

F. Coordination Drawing Submittals: Comply with requirements specified in Division 01 Section "Project Management and Coordination."

G. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."

H. Application for Payment and Schedule of Values: Comply with requirements specified in Division 01 Section "Payment Procedures."

I. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Division 01 Section "Quality Requirements."

J. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 01 Section "Closeout Procedures."

K. Maintenance Data: Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."

L. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

M. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.

N. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

O. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

P. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

Q. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

R. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

S. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

T. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
1. Name of evaluation organization.
2. Date of evaluation.
3. Time period when report is in effect.
4. Product and manufacturers' names.
5. Description of product.
6. Test procedures and results.
7. Limitations of use.

U. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

V. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

W. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

X. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

2.2 DELEGATED-DESIGN SERVICES

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF electronic file paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

B. Project Closeout and Maintenance Material Submittals: See requirements in Division 01 Section "Closeout Procedures."

C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

A. Action Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action, as follows:
1. No Exception Taken
2. Revise as Noted
3. Returned without Review
4. Revise and Resubmit
5. Rejected

B. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.

D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

E. Submittals not required by the Contract Documents may be returned by the Architect without action.

END OF SECTION 013300

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
   1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
   2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
   3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, Commissioning Authority, or authorities having jurisdiction are not limited by provisions of this Section.

C. Related Requirements:
   1. Division 01 Section "Allowances" for testing and inspecting allowances.
   2. Divisions 02 through 33 Sections for specific test and inspection requirements.

1.2 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.

C. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
   1. Integrated Exterior Mockups: Mockups of the exterior envelope erected separately from the building but on Project site, consisting of multiple products, assemblies, and subassemblies.

D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.

E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

F. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.

G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
   1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).

J. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.3 CONFLICTING REQUIREMENTS

A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.4 ACTION SUBMITTALS

A. Shop Drawings: For integrated exterior mockups, provide plans, sections, and elevations, indicating materials and size of mockup construction.
   1. Indicate manufacturer and model number of individual components.
   2. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.

1.5 INFORMATIONAL SUBMITTALS

A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.

B. Qualification Data : For Contractor's quality-control personnel.

C. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems:

1. Seismic-force-resisting system, designated seismic system, or component listed in the designated seismic system quality-assurance plan prepared by Architect.
2. Main wind-force-resisting system or a wind-resisting component listed in the wind-force-resisting system quality-assurance plan prepared by Architect.

D. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

E. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
1. Specification Section number and title.
2. Entity responsible for performing tests and inspections.
3. Description of test and inspection.
4. Identification of applicable standards.
5. Identification of test and inspection methods.
6. Number of tests and inspections required.
7. Time schedule or time span for tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

1.6 CONTRACTOR'S QUALITY-CONTROL PLAN

A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.

B. Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
1. Project quality-control manager may also serve as Project superintendent.

C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.

D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
1. Contractor-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.
2. Special inspections required by authorities having jurisdiction and indicated on the "Statement of Special Inspections."
3. Owner-performed tests and inspections indicated in the Contract Documents, including tests and inspections indicated to be performed by the Commissioning Authority.

E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.

F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective

actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.7 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
   1. Date of issue.
   2. Project title and number.
   3. Name, address, and telephone number of testing agency.
   4. Dates and locations of samples and tests or inspections.
   5. Names of individuals making tests and inspections.
   6. Description of the Work and test and inspection method.
   7. Identification of product and Specification Section.
   8. Complete test or inspection data.
   9. Test and inspection results and an interpretation of test results.
   10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
   11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
   12. Name and signature of laboratory inspector.
   13. Recommendations on retesting and reinspecting.

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
   1. Name, address, and telephone number of technical representative making report.
   2. Statement on condition of substrates and their acceptability for installation of product.
   3. Statement that products at Project site comply with requirements.
   4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
   5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
   6. Statement whether conditions, products, and installation will affect warranty.
   7. Other required items indicated in individual Specification Sections.

C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
   1. Name, address, and telephone number of factory-authorized service representative making report.
   2. Statement that equipment complies with requirements.
   3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
   4. Statement whether conditions, products, and installation will affect warranty.
   5. Other required items indicated in individual Specification Sections.

D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.8 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.

F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
   1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.

G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329 ; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
   1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
   2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
   1. Contractor responsibilities include the following:
      a. Provide test specimens representative of proposed products and construction.
      b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
      c. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
      d. When testing is complete, remove test specimens, assemblies, and mockups; do not reuse products on Project.
   2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

J. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

K. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
   1. Contractor responsibilities include the following:
      a. Provide test specimens representative of proposed products and construction.
      b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
      c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
      d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
      e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
      f. When testing is complete, remove test specimens, assemblies, and mockups; do not reuse products on Project.
   2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect and Commissioning Authority, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

L. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
   1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
   2. Notify Architect seven days in advance of dates and times when mockups will be constructed.
   3. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed during the construction at Project.
   4. Demonstrate the proposed range of aesthetic effects and workmanship.
   5. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
      a. Allow seven days for initial review and each re-review of each mockup.
   6. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
   7. Demolish and remove mockups when directed unless otherwise indicated.

M. Integrated Exterior Mockups: Construct integrated exterior mockup according to approved Shop Drawings and as indicated on Drawings. Coordinate installation of exterior envelope materials and products for which mockups are required in individual Specification Sections, along with supporting materials.
   1. Provide the following mockups and those indicated on Drawings;
      a. Panel Standoff and backlighting

1.9 QUALITY CONTROL

A. General: Refer to General Conditions of the Contract for additional information in testing and inspections.

B. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
   1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.

2. Payment for these services will be made from testing and inspecting allowances, as authorized by Change Orders.
3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

C. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
    a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

D. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 01 Section "Submittal Procedures."

E. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

F. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

G. Testing Agency Responsibilities: Cooperate with Architect, Commissioning Authority , and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect, Commissioning Authority, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
6. Do not perform any duties of Contractor.

H. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
   1. Access to the Work.
   2. Incidental labor and facilities necessary to facilitate tests and inspections.
   3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
   4. Facilities for storage and field curing of test samples.
   5. Preliminary design mix proposed for use for material mixes that require control by testing agency.
   6. Security and protection for samples and for testing and inspecting equipment at Project site.

I. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
   1. Schedule times for tests, inspections, obtaining samples, and similar activities.

J. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents as a component of Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses.
   1. Distribution: Distribute schedule to Owner, Architect, Commissioning Authority, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.10 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
   1. Date test or inspection was conducted.
   2. Description of the Work tested or inspected.
   3. Date test or inspection results were transmitted to Architect.
   4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's, Commissioning Authority's, reference during normal working hours.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Division 01 Section "Execution."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

SECTION 014200 - REFERENCES

PART 1 - GENERAL

1.1 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.

H. "Provide": Furnish and install, complete and ready for the intended use.

I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.2 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
   1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.3 ABBREVIATIONS AND ACRONYMS

A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Thomson Gale's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."

B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States."

C. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is believed to be accurate as of the date of the Contract Documents.

D. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Information is subject to change and is up to date as of the date of the Contract Documents.

E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

F. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

SECTION 014339 –MOCKUP

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Requirements for interior and exterior envelope mockups.

1.2 DEFINITION

A. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
   1. Integrated Exterior Mockups: Mockups of the exterior envelope shall be erected in locations directed by Owner, consisting of multiple products, assemblies, and subassemblies; refer to Drawings for scope.
   2. Integrated Room Mockups: Owner to select unit to complete as interior mockup, unit will include; interior spaces complete with wall, floor, and ceiling finishes, doors, windows, millwork, casework, specialties, furnishings and equipment, and lighting.

1.3 SUBMITTALS

A. Product Data and Samples: Submit in accordance with the requirements of each respective product sections.

B. Time schedule for the construction of mockups shall be prepared and submitted to the Architect for review prior to construction.

C. Product Data: When and as directed by the Architect, engineering design calculations confirming the structural stability of the mockups.

1.4 QUALITY ASSURANCE

A. Fabricators' and Installers' Qualifications: In accordance with the [ ] provisions of the specification Sections for products and materials incorporated into the mockups.

B. In constructing mockups, take measures to ensure the safety of Project personnel and the public.

C. During construction of mockup, representatives of the manufacturers shall be present on site to coordinate installation.

1.5 COORDINATION

A. Prior to installation in or on building, construct mockups for each system and finish required to verify selections made under sample submittals and to demonstrate aesthetic effects as well as qualities of materials and execution. Building mockups shall comply with the following requirements, using materials indicated for final unit of work.
   1. Place mockups on site in the location directed by Architect and agreed upon by Owner.
   2. Notify Architect one week in advance of the dates and times when mockups will be constructed.
   3. Demonstrate the proposed range of aesthetic effects and workmanship.
   4. Obtain Architect's acceptance of mockups before start of final unit of work.
   5. Retain and maintain mockups during construction in an undisturbed condition as a standard for judging the completed work.
      a. Accepted mockups in an undisturbed condition at the time of construction.

B. Should mockups fail to meet the Architect's approval or performance testing, partially or completely, they shall be taken down or dismantled, and reconstructed to the extent necessary, until acceptance has been obtained.

C. Time the completion and reworking of mockups necessary to obtain acceptance to avoid delay in the construction schedule of the Project; coordinate with the timeline of the OAC meetings.
   1. Update the Construction Schedule to reflect required revisions to mockups.

PART 2 - PRODUCTS

2.1 PRODUCTS

A. Materials and finishes shall comply with the requirements specified in the Contract Documents and shall match previously submitted and approved samples.

B. Mockup to be approximately 6’ x 9’ showing all exterior finish and penetration conditions.

C. Exterior Envelope Mockups:
   1. Construct mock-up "full depth" and full size, excluding interior finish substrate and roofing material at inside face of roof parapet. Include all wall, roof and soffit weather-, resistive assembly components. Include framing, sheathings, underlayments, flashings, air barriers, vapor retarders, insulation, sealants, and other full-envelope components. Include typical hardware, fasteners, and other accessories.
      a. Quality Control, prepare separate mock-up illustrating wall substrate with attached cladding types. Mock-up shall demonstrate wall performance and establish standard of quality and workmanship. Illustrate panels, openings, sills, heads, jambs, cladding attachment, thermal insulation, furring, sheathing, air barrier, joints, flashings, corner conditions, parapet, sills, flashings, material transitions, exterior/interior corner, connection to foundation and parapet and workmanship.
         1) Approximate size: As indicated.
         2) Accepted sample may remain as part of work and will be used as basis for acceptance of remaining cladding. Unacceptable samples shall be removed.
         3) Test mock-up with water hose and other means to verify performance.
   2. Mock-up size: As required for incorporation of indicated building components, as indicated on Drawings, see sketch for mock-up proposal, minimum 6x9 ft.
   3. Refer to Architectural Drawings for scope.
   4. Construct mock-up on project site. Locate so that mock-up may remain undisturbed until Substantial Completion or removal is approved by architect, whichever occurs first.

PART 3 - EXECUTION

3.1 INSTALATION

A. Install materials in a manner that will duplicate the appearance in the completed building.
   1. Construct mockups using same construction personnel, means, and methods as intended for use in the Contract Documents.
   2. Mockups shall be constructed in accordance with details indicated on the drawings and approved Shop Drawings.
   3. Mockups shall be located where specified or directed, and shall not be built "in place" as part of the permanent construction.

3.2 TESTING

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections and prepare test reports.
   1. Coordinate all testing, frequency and allowed pass/fail rate with Owner’s testing agents.

B. Testing for Air Barriers:
   1. Quantitative Air Leakage Testing: Testing not to exceed the test pressure differential, positive and negative, indicated in "Performance Requirements" Article for air barrier assembly air leakage according to ASTM E 283 or ASTM E 783.

C. Testing of Exterior Envelope:
   1. Water-Spray Test: After completing the installation of 75-foot- by-2-story minimum area of wall panel assembly, test assembly for water penetration according to AAMA 501.2 in a 2-bay area directed by Architect.

D. Testing of windows, and storefront; refer to individual sections for additional information about each test.
   1. Test a window as installed in each wall type assembly.
   2. Water Penetration (Windows): Areas shall be tested according to ASTM E 1105 at a minimum uniform and cyclic static-air-pressure difference of 0.67 times the static-air-pressure difference specified for laboratory testing under "Performance Requirements" Article, but not less than 4.18 lbf/sq. ft. (200 Pa) and shall not evidence water penetration.
   3. Water Spray Test (Storefront/Ribbon Only Non-operational): Before installation of interior finishes has begun, a minimum area of 75 feet (23 m) by 1 story of aluminum-framed systems designated by Architect shall be tested according to AAMA 501.2 and shall not evidence water penetration.
   4. Air Infiltration: Areas shall be tested for air leakage of 1.5 times the rate specified for laboratory testing under "Performance Requirements" Article, but not more than 0.09 cfm/sq. ft. of fixed wall area when tested according to ASTM E 783 at a minimum static-air-pressure difference of 6.24 lbf/sq. ft.

E. Testing of Joint Sealant:
   1. Before installing sealants, field test their adhesion to Project joint substrates. Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.

3.3 MAINTENANCE

A. Maintain mockups during course of construction or until removal is directed.

B. Repair damage to mockups immediately upon occurrence. Maintain mockups and surrounding site in a safe and clean condition.

END OF SECTION 014339

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

B. Related Requirements:
   1. Division 01 Section "Summary" for work restrictions and limitations on utility interruptions.

1.2 USE CHARGES

A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect testing agencies, and authorities having jurisdiction.

B. Sewer Service: Pay sewer-service use charges for sewer usage by all entities for construction operations.

C. Water Service: Pay water-service use charges for water used by all entities for construction operations.

D. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

E. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.3 INFORMATIONAL SUBMITTALS

A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

B. Erosion- and Sedimentation-Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.

C. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.

D. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.
   1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
   2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.

3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.

E. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:
1. Locations of dust-control partitions at each phase of work.
2. HVAC system isolation schematic drawing.
3. Location of proposed air-filtration system discharge.
4. Waste handling procedures.
5. Other dust-control measures.

1.4 QUALITY ASSURANCE

A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

C. Accessible Temporary Egress: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

1.5 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Chain-Link Fencing: Minimum 2-inch, 0.148-inch- thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts, with 1-5/8-inch- OD top rails.

B. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil minimum thickness, with flame-spread rating of 15 or less per ASTM E 84 and passing NFPA 701 Test Method 2.

C. Dust-Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches.

D. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

2.2 TEMPORARY FACILITIES

A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

B. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
   1. Store combustible materials apart from building.

2.3 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
   1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
   2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
   3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction. and clean HVAC system as required in Division 01 Section "Closeout Procedures."
      a. Refer to Division 01 Section “Indoor Air Quality Management” for additional information.

C. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
   1. Locate facilities to limit site disturbance as specified in Division 01 Section "Summary."

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.
   1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
   1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.

C. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

E. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.

F. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
   1. Provide dehumidification systems when required to reduce substrate moisture levels to level required to allow installation or application of finishes.

G. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.

H. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
   1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

I. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install one telephone line(s) for each field office.

J. Electronic Communication Service: Provide a desktop computer in the primary field office adequate for use by Architect and Owner to access Project electronic documents and maintain electronic communications.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:
   1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
   2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Use of Permanent Roads and Paved Areas: Locate temporary roads and paved areas in same location as permanent roads and paved areas. Construct and maintain temporary roads and paved areas adequate for construction operations. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.
   1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
   2. Recondition base after temporary use, including removing contaminated material, regrading, proofrolling, compacting, and testing.

C. Traffic Controls: Comply with requirements of authorities having jurisdiction.
   1. Protect existing site improvements to remain including curbs, pavement, and utilities.
   2. Maintain access for fire-fighting equipment and access to fire hydrants.

D. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
   1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
   2. Remove snow and ice as required to minimize accumulations.

E. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
   1. Identification Signs: Provide Project identification signs as indicated on Drawings.
   2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
      a. Provide temporary, directional signs for construction personnel and visitors.
   3. Maintain and touchup signs so they are legible at all times.

F. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
   1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
   1. Comply with work restrictions specified in Division 01 Section "Summary."

C. Temporary Erosion and Sedimentation Control: Comply with requirements of 2003 EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.

D. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

E. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.

F. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using environmentally safe materials.

G. Site Enclosure Fence: Before construction operations begin furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.
   1. Extent of Fence: As indicated on Drawings.
   2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.

H. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day.

I. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

J. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.

K. Covered Walkway: Erect protective, covered walkway for passage of individuals through or adjacent to Project site. Coordinate with entrance gates, other facilities, and obstructions. Comply with regulations of authorities having jurisdiction and requirements indicated on Drawings.
   1. Construct covered walkways using scaffold or shoring framing.
   2. Provide overhead decking, protective enclosure walls, handrails, barricades, warning signs, exit signs, lights, safe and well-drained walkways, and similar provisions for protection and safe passage.
   3. Paint and maintain appearance of walkway for duration of the Work.

L. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
   1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.

M. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
   1. Prohibit smoking in construction areas.
   2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
   3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
   4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.5 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintenance: Maintain facilities in good operating condition until removal.
   1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion.

Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 01 Section "Closeout Procedures."

END OF SECTION 015000

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

B. Related Requirements:
1. Division 01 Section "Allowances" for products selected under an allowance.
2. Division 01 Section "Alternates" for products selected under an alternate.
3. Division 01 Section "Substitution Procedures" for requests for substitutions.
4. Division 01 Section "References" for applicable industry standards for products specified.

1.2 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.3 ACTION SUBMITTALS

A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
a. Form of Approval: As specified in Division 01 Section "Submittal Procedures."

b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

B. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 01 Section "Submittal Procedures." Show compliance with requirements.

1.4 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:
1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:
1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.
7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.6 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.

2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
3. See Divisions 02 through 33 Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Division 01 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.

B. Product Selection Procedures:
1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
3. Products:
   a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.
   b. Nonrestricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.
4. Manufacturers:
   a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable

products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.

b. Nonrestricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.

5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.

1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Division 01 Section "Substitution Procedures" for proposal of product.

D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:

1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
   1. Construction layout.
   2. Field engineering and surveying.
   3. Installation of the Work.
   4. Coordination of Owner-installed products.
   5. Progress cleaning.
   6. Starting and adjusting.
   7. Protection of installed construction.
   8. Correction of the Work.

B. Related Requirements:
   1. Division 01 Section "Summary" for limits on use of Project site.
   2. Division 01 Section "Submittal Procedures" for submitting surveys.
   3. Division 01 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
   4. Division 02 Sections for demolition and removal of selected

1.2 INFORMATIONAL SUBMITTALS

A. Qualification Data: For professional engineer.

B. Certificates: Submit certificate signed by professional engineer certifying that location and elevation of improvements comply with requirements.

C. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

D. Certified Surveys: Submit two copies signed by professional engineer.

E. Final Property Survey: Submit 10 copies showing the Work performed and record survey data.

1.3 QUALITY ASSURANCE

A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.
   1. For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with requirements in Division 01 sustainable design requirements Section.

B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
   1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
   1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
   2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
   1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
   2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
   3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
   1. Description of the Work.
   2. List of detrimental conditions, including substrates.
   3. List of unacceptable installation tolerances.
   4. Recommended corrections.

D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Division 01 Section "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.

B. General: Engage a professional engineer to lay out the Work using accepted surveying practices.
1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
2. Establish limits on use of Project site.
3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
4. Inform installers of lines and levels to which they must comply.
5. Check the location, level and plumb, of every major element as the Work progresses.
6. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.

D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

3.4 FIELD ENGINEERING

A. Identification: Owner will identify existing benchmarks, control points, and property corners.

B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
   1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
   2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
   1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
   2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
   3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

D. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.

E. Final Property Survey: Engage a professional engineer to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by professional engineer, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.
   1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
   2. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

3.5 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
   1. Make vertical work plumb and make horizontal work level.
   2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
   3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
   4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.

F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 OWNER-INSTALLED PRODUCTS

A. Site Access: Provide access to Project site for Owner's construction personnel.

B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.
1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
2. Preinstallation Conferences: Include Owner's construction personnel at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

3.7 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
   a. Use containers intended for holding waste materials of type to be stored.

4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
   1. Remove liquid spills promptly.
   2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

H. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

I. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.8 STARTING AND ADJUSTING

A. Coordinate startup and adjusting of equipment and operating components with requirements in Division 01 Section "General Commissioning Requirements."

B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

E. Manufacturer's Field Service: Comply with qualification requirements in Division 01 Section "Quality Requirements."

3.9 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 017300

SECTION 017329 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

1.2 SUMMARY

A. This Section includes procedural requirements for cutting and patching.

B. Related Sections include the following:
   1. Divisions 02 through 48 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.
   2. Division 07 Section "Through-Penetration Firestop Systems" for patching fire-rated construction.

1.3 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other Work.

B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.4 SUBMITTALS

A. Cutting and Patching Proposal: Submit a proposal describing procedures at least 10 days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:
   1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
   2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
   3. Products: List products to be used and firms or entities that will perform the Work.
   4. Dates: Indicate when cutting and patching will be performed.
   5. Utility Services and Mechanical/Electrical Systems: List services/systems that cutting and patching procedures will disturb or affect. List services/systems that will be relocated and those that will be temporarily out of service. Indicate how long services/systems will be disrupted.
   6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
   7. Architect's Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

1.5 QUALITY ASSURANCE

A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.

B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operating elements include the following:
   1. Primary operational systems and equipment.
   2. Air or smoke barriers.
   3. Fire-suppression systems.
   4. Mechanical systems piping and ducts.
   5. Control systems.
   6. Communication systems.
   7. Conveying systems.
   8. Electrical wiring systems.

C. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Miscellaneous elements include the following:
   1. Water, moisture, or vapor barriers.
   2. Membranes and flashings.
   3. Exterior curtain-wall construction.
   4. Equipment supports.
   5. Piping, ductwork, vessels, and equipment.
   6. Noise- and vibration-control elements and systems.

D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

E. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.6 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.
   1. Specific systems to be repaired that are not covered by other sections include but are not limited to
      a. Skylights
      b. Windows

B. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
   1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials.

2.2 LEAD PAINT

A. Lead Paint: It is not expected that lead paint will be encountered in the Work.
   1. If suspected lead paint is encountered, do not disturb; immediately notify Architect and Owner.

B. Perform preparation for painting of substrates known to include lead paint in accordance with EPA Renovation, Repair and Painting Rule and additional requirements of authorities having jurisdiction.

C. WARNING! Removal of old paint by sanding, scraping or other means may generate dust or fumes that contain lead. Exposure to lead dust or fumes may cause brain damage or other adverse health effects, especially in children or pregnant women. Controlling exposure to lead or other hazardous substances requires the use of proper protective equipment, such as a properly fitted respirator (NIOSH approved) and proper containment and cleanup. For more information, call the National Lead Information Center at 1-800-424-LEAD (in US) or contact your local health authority.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
   1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
   2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.

3.3 PERFORMANCE

A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
   1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Excavating and Backfilling: Comply with requirements where required by cutting and patching operations.
5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
6. Proceed with patching after construction operations requiring cutting are complete.

C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.
   1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
   2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
      a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
      b. Restore damaged pipe covering to its original condition.
   3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
      a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
   4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
   5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.
   1. Refer to Division 04 Section “Maintenance of Unit Masonry” for additional information and requirements related to treatment of masonry at all saw cut areas including but not limited to tuck pointing and repainting.

END OF SECTION 017329

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
   1. Substantial Completion procedures.
   2. Final completion procedures.
   3. Warranties.
   4. Final cleaning.
   5. Repair of the Work.

B. Related Requirements:
   1. Division 01 Section "Execution" for progress cleaning of Project site.
   2. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
   3. Division 01 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
   4. Division 01 Section "Demonstration and Training" for requirements for instructing Owner's personnel.
   5. Divisions 02 through 33 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.2 ACTION SUBMITTALS

A. Product Data: For cleaning agents.

B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.

C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.3 CLOSEOUT SUBMITTALS

A. Certificates of Release: From authorities having jurisdiction.

B. Certificate of Insurance: For continuing coverage.

C. Field Report: For pest control inspection.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.5 SUBSTANTIAL COMPLETION PROCEDURES

A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.

B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
   1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
   2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
   3. Submit closeout submittals specified in individual Divisions 02 through 33 Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
   4. Submit maintenance material submittals specified in individual Divisions 02 through 33 Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number where applicable.
      a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Architect's signature for receipt of submittals.
   5. Submit test/adjust/balance records.
   6. Submit sustainable design submittals required in Division 01 sustainable design requirements Section and in individual Division 02 through 33 Sections.
   7. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
   1. Advise Owner of pending insurance changeover requirements.
   2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
   3. Complete startup and testing of systems and equipment.
   4. Perform preventive maintenance on equipment used prior to Substantial Completion.
   5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Division 01 Section "Demonstration and Training."
   6. Advise Owner of changeover in heat and other utilities.
   7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
   8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
   9. Complete final cleaning requirements, including touchup painting.
   10. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

1.6 FINAL COMPLETION PROCEDURES

A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:
   1. Submit a final Application for Payment according to Division 01 Section "Payment Procedures."

2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report.

B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.7 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction. Use form agreed upon.
1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
3. Include the following information at the top of each page:
    a. Project name.
    b. Date.
    c. Name of Architect.
    d. Name of Contractor.
    e. Page number.
4. Submit list of incomplete items in the following format:
    a. MS Excel electronic file. Architect, will return annotated file.
    b. PDF electronic file. Architect, will return annotated file.
    c. Three paper copies. Architect, will return two copies.

1.8 SUBMITTAL OF PROJECT WARRANTIES

A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.

B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.

C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.

3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
    a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
    b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
    d. Remove tools, construction equipment, machinery, and surplus material from Project site.
    e. Remove snow and ice to provide safe access to building.
    f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
    g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
    h. Sweep concrete floors broom clean in unoccupied spaces.
    i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
    j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
    k. Remove labels that are not permanent.
    l. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.

m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
o. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
    1) Clean HVAC system in compliance with NADCA Standard 1992-01. Provide written report on completion of cleaning.
p. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency, replace bulbs that have been used during construction.
q. Leave Project clean and ready for occupancy.

C. Pest Control: Comply with pest control requirements in Division 01 Section "Temporary Facilities and Controls." Prepare written report.

3.2 REPAIR OF THE WORK

A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.
    a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 017700

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
   1. Operation and maintenance documentation directory.
   2. Emergency manuals.
   3. Operation manuals for systems, subsystems, and equipment.
   4. Product maintenance manuals.
   5. Systems and equipment maintenance manuals.

B. Related Requirements:
   1. Division 01 Section "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
   2. Divisions 02 through 33 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

1.2 DEFINITIONS

A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.

B. Subsystem: A portion of a system with characteristics similar to a system.

1.3 CLOSEOUT SUBMITTALS

A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
   1. Architect and Commissioning Authority will comment on whether content of operations and maintenance submittals are acceptable.
   2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

B. Format: Submit operations and maintenance manuals in the following format:
   1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect.
      a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
      b. Enable inserted reviewer comments on draft submittals.

C. Initial Manual Submittal: Submit draft copy of each manual at least 30days before commencing demonstration and training. Architect and Commissioning Authority will comment on whether general scope and content of manual are acceptable.

D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect and Commissioning Authority will return copy with comments.

1. Correct or revise each manual to comply with Architect's and Commissioning Authority's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's and Commissioning Authority's comments and prior to commencing demonstration and training.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section in the directory for each of the following:
   1. List of documents.
   2. List of systems.
   3. List of equipment.
   4. Table of contents.

B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.

C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.

D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
   1. Title page.
   2. Table of contents.
   3. Manual contents.

B. Title Page: Include the following information:
   1. Subject matter included in manual.
   2. Name and address of Project.
   3. Name and address of Owner.
   4. Date of submittal.
   5. Name and contact information for Contractor.
   6. Name and contact information for Construction Manager.
   7. Name and contact information for Architect.
   8. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
   9. Cross-reference to related systems in other operation and maintenance manuals.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

E. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

2.3 EMERGENCY MANUALS

A. Content: Organize manual into a separate section for each of the following:
1. Type of emergency.
2. Emergency instructions.
3. Emergency procedures.

B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
1. Fire.
2. Flood.
3. Gas leak.
4. Water leak.
5. Power failure.
6. Water outage.
7. System, subsystem, or equipment failure.
8. Chemical release or spill.

C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.

D. Emergency Procedures: Include the following, as applicable:
1. Instructions on stopping.
2. Shutdown instructions for each type of emergency.
3. Operating instructions for conditions outside normal operating limits.
4. Required sequences for electric or electronic systems.
5. Special operating instructions and procedures.

2.4 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.

2. Performance and design criteria if Contractor has delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:
1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include the following, as applicable:
1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.5 PRODUCT MAINTENANCE MANUALS

A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

C. Product Information: Include the following, as applicable:
1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
   1. Inspection procedures.
   2. Types of cleaning agents to be used and methods of cleaning.
   3. List of cleaning agents and methods of cleaning detrimental to product.
   4. Schedule for routine cleaning and maintenance.
   5. Repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
   1. Include procedures to follow and required notifications for warranty claims.

2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
   1. Standard maintenance instructions and bulletins.
   2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
   3. Identification and nomenclature of parts and components.
   4. List of items recommended to be stocked as spare parts.

D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
   1. Test and inspection instructions.
   2. Troubleshooting guide.
   3. Precautions against improper maintenance.
   4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
   5. Aligning, adjusting, and checking instructions.
   6. Demonstration and training video recording, if available.

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
   1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
   2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
   1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.

B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.

C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
   1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
   2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
   1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
   1. Do not use original project record documents as part of operation and maintenance manuals.
   2. Comply with requirements of newly prepared record Drawings in Division 01 Section "Project Record Documents."

G. Comply with Division 01 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 017823

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for project record documents, including the following:
   1. Record Drawings.
   2. Record Specifications.
   3. Record Product Data.
   4. Miscellaneous record submittals.

B. Related Requirements:
   1. Division 01 Section "Execution" for final property survey.
   2. Division 01 Section "Closeout Procedures" for general closeout procedures.
   3. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
   4. Divisions 02 through 33 Sections for specific requirements for project record documents of the Work in those Sections.

1.2 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:
   1. Number of Copies: Submit one set of marked-up record annotated PDF electronic file.

B. Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.

C. Record Product Data: Submit annotated PDF electronic files and directories of each submittal.
   1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit annotated PDF electronic files and directories of each submittal.

E. Reports: Submit written report weekly indicating items incorporated into project record documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Record Drawings: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
   1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or

entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
   a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
   b. Accurately record information in an acceptable drawing technique.
   c. Record data as soon as possible after obtaining it.
   d. Record and check the markup before enclosing concealed installations.
   e. Cross-reference record prints to corresponding archive photographic documentation.
2. Content: Types of items requiring marking include, but are not limited to, the following:
   a. Dimensional changes to Drawings.
   b. Revisions to details shown on Drawings.
   c. Depths of foundations below first floor.
   d. Locations and depths of underground utilities.
   e. Revisions to routing of piping and conduits.
   f. Revisions to electrical circuitry.
   g. Actual equipment locations.
   h. Duct size and routing.
   i. Locations of concealed internal utilities.
   j. Changes made by Change Order or Construction Change Directive.
   k. Changes made following Architect's written orders.
   l. Details not on the original Contract Drawings.
   m. Field records for variable and concealed conditions.
   n. Record information on the Work that is shown only schematically.
3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.
6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
1. Format: Same digital data software program, version, and operating system as the original Contract Drawings.
2. Format: Annotated PDF electronic file with comment function enabled.
3. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
4. Refer instances of uncertainty to Architect for resolution.
5. Architect will furnish Contractor one set of digital data files of the Contract Drawings for use in recording information.
   a. See Division 01 Section "Submittal Procedures" for requirements related to use of Architect's digital data files.
   b. Architect will provide data file layer information. Record markups in separate layers.

C. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing record Drawings where Architect determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.
1. New Drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or other modification.
2. Consult Architect for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. Integrate newly prepared record

Drawings into record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.

D. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
   1. Format: Annotated PDF electronic file with comment function enabled.
   2. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
   3. Identification: As follows:
      a. Project name.
      b. Date.
      c. Designation "PROJECT RECORD DRAWINGS."
      d. Name of Architect.
      e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
   1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.

B. Format: Submit record Specifications as annotated PDF electronic file or scanned PDF electronic file(s) of marked-up paper copy of Specifications.

2.3 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
   1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
   2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
   3. Note related Change Orders, record Specifications, and record Drawings where applicable.

B. Format: Submit record Product Data as annotated PDF electronic file or scanned PDF electronic file(s) of marked-up paper copy of Product Data.
   1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

2.4 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

B. Format: Submit miscellaneous record submittals as PDF electronic file or scanned PDF electronic file(s) of marked-up miscellaneous record submittals.
   1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.

B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

END OF SECTION 017839

SECTION 017900 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
   1. Demonstration of operation of systems, subsystems, and equipment.
   2. Training in operation and maintenance of systems, subsystems, and equipment.

B. Related Requirements:
   1. Divisions 02 through 33 Sections for specific requirements for demonstration and training for products in those Sections.

1.2 INFORMATIONAL SUBMITTALS

A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
   1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.

B. Attendance Record: For each training module, submit list of participants and length of instruction time.

C. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.

1.3 CLOSEOUT SUBMITTALS

A. Demonstration and Training Video Recordings: Submit two copies within seven days of end of each training module.
   1. Identification: On each copy, provide an applied label with the following information:
      a. Name of Project.
      b. Name of Architect.
      c. Name of Construction Manager.
      d. Name of Contractor.
      e. Date of video recording.
   2. Transcript: Prepared and bound in format matching operation and maintenance manuals. Mark appropriate identification on front and spine of each binder. Include a cover sheet with same label information as the corresponding video recording. Include name of Project and date of video recording on each page.
   3. Transcript: Prepared in PDF electronic format. Include a cover sheet with same label information as the corresponding video recording and a table of contents with links to corresponding training components. Include name of Project and date of video recording on each page.
   4. At completion of training, submit complete training manual(s) for Owner's use in PDF electronic file format.

1.4 QUALITY ASSURANCE

A. Preinstruction Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to demonstration and training including, but not limited to, the following:
   1. Inspect and discuss locations and other facilities required for instruction.
   2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
   3. Review required content of instruction.
   4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.5 COORDINATION

A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.

B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.

B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:
   1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
      a. System, subsystem, and equipment descriptions.
      b. Performance and design criteria if Contractor is delegated design responsibility.
      c. Operating standards.
      d. Regulatory requirements.
      e. Equipment function.
      f. Operating characteristics.
      g. Limiting conditions.
      h. Performance curves.
   2. Documentation: Review the following items in detail:
      a. Emergency manuals.
      b. Operations manuals.
      c. Maintenance manuals.
      d. Project record documents.
      e. Identification systems.
      f. Warranties and bonds.
      g. Maintenance service agreements and similar continuing commitments.
   3. Emergencies: Include the following, as applicable:

a. Instructions on meaning of warnings, trouble indications, and error messages.
b. Instructions on stopping.
c. Shutdown instructions for each type of emergency.
d. Operating instructions for conditions outside of normal operating limits.
e. Sequences for electric or electronic systems.
f. Special operating instructions and procedures.

4. Operations: Include the following, as applicable:
   a. Startup procedures.
   b. Equipment or system break-in procedures.
   c. Routine and normal operating instructions.
   d. Regulation and control procedures.
   e. Control sequences.
   f. Safety procedures.
   g. Instructions on stopping.
   h. Normal shutdown instructions.
   i. Operating procedures for emergencies.
   j. Operating procedures for system, subsystem, or equipment failure.
   k. Seasonal and weekend operating instructions.
   l. Required sequences for electric or electronic systems.
   m. Special operating instructions and procedures.
5. Adjustments: Include the following:
   a. Alignments.
   b. Checking adjustments.
   c. Noise and vibration adjustments.
   d. Economy and efficiency adjustments.
6. Troubleshooting: Include the following:
   a. Diagnostic instructions.
   b. Test and inspection procedures.
7. Maintenance: Include the following:
   a. Inspection procedures.
   b. Types of cleaning agents to be used and methods of cleaning.
   c. List of cleaning agents and methods of cleaning detrimental to product.
   d. Procedures for routine cleaning
   e. Procedures for preventive maintenance.
   f. Procedures for routine maintenance.
   g. Instruction on use of special tools.
8. Repairs: Include the following:
   a. Diagnosis instructions.
   b. Repair instructions.
   c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
   d. Instructions for identifying parts and components.
   e. Review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION

3.1 PREPARATION

A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Division 01 Section "Operations and Maintenance Data."

B. Set up instructional equipment at instruction location.

3.2 INSTRUCTION

A. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
   1. Architect will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
   2. Owner will furnish an instructor to describe Owner's operational philosophy.
   3. Owner will furnish Contractor with names and positions of participants.

B. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
   1. Schedule training with Owner, through Architect, with at least seven days' advance notice.

C. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.

D. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

END OF SECTION 017900

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:
   1. Footings.
   2. Foundation walls.
   3. Slabs-on-grade.
   4. Elevated slab
   5. Concrete toppings

B. Related Sections
   1. Division 01 Section “Sustainability Design Requirements”
   2. Division 03 Section “Concrete Finishing” for balance of information related to concrete sealing and polishing.

1.2 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.

B. Water/Cement Ratio (w/cm): The ratio by weight of water to cementitious materials.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.
   1. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
      a. Contractor's superintendent.
      b. Independent testing agency responsible for concrete design mixtures.
      c. Ready-mix concrete manufacturer.
      d. Concrete Subcontractor.
      e. Special concrete finish Subcontractor.
   2. Review the following:
      a. Special inspection and testing and inspecting agency procedures for field quality control.
      b. Construction joints, control joints, isolation joints, and joint-filler strips.
      c. Semirigid joint fillers.
      d. Vapor-retarder installation.
      e. Anchor rod and anchorage device installation tolerances.
      f. Cold and hot weather concreting procedures.
      g. Concrete finishes and finishing.
      h. Curing procedures.
      i. Forms and form-removal limitations.
      j. Shoring and reshoring procedures.
      k. Methods for achieving specified floor and slab flatness and levelness.
      l. Floor and slab flatness and levelness measurements.

m. Concrete repair procedures.
n. Concrete protection.
o. Initial curing and field curing of field test cylinders (ASTM C31/C31M.)
p. Protection of field cured field test cylinders.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.
1. Include statement indicating the VOC content of field applied adhesives, sealants, paints, and coatings.

B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments. Conform to ACI 318 Chapter 5. Submit mix designs based on field experience, trial mixture, or both with all supporting data as outlined in ACI.

C. Steel Reinforcement Shop Drawings, comply with ACI 315: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

D. Exposed Concrete Forming: for exposed concrete submit form material and tie layout for architect's approval.

E. Construction Joint Layout: Indicate proposed construction joints required to construct the structure. Location of construction joints is subject to approval of the Architect.

F. Material Certificates: For each of the following:
1. Cementitious materials.
2. Admixtures.
2. Form materials and form-release agents.
3. Steel reinforcement and accessories.
4. Curing compounds.
5. Floor and slab treatments.
6. Bonding agents.
7. Adhesives.
8. Vapor retarders.
9. Semirigid joint filler.
10. Joint-filler strips.
11. Repair materials.

G. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:
1. Aggregates.

H. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.

I. Field quality-control reports.

J. Regional Materials – Provide product data for materials that have been manufactured within 500 miles of the Project site from materials that have been extracted, harvested, or recovered within 500 miles of the Project site.

K. Adhesives and Sealants – Include statement for adhesives and sealants used inside the weatherproofing system, including printed statement of VOC content.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer with a minimum of five years experience on projects of similar scope and complexity and who employs Project personnel qualified as an ACI-certified Flatwork Technician and Finisher and a supervisor who is a certified ACI Flatwork Concrete Finisher/Technician or an ACI Concrete Flatwork Technician

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities".

C. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.

D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

E. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M, "Structural Welding Code - Reinforcing Steel."

F. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
1. ACI 301, "Specifications for Structural Concrete," Sections 1 through 5 and Section 7, "Lightweight Concrete."
2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

G. Preinstallation Conference: Conduct conference at Project site.
1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
    a. Contractor's superintendent.
    b. Independent testing agency responsible for concrete design mixtures.
    c. Ready-mix concrete manufacturer.
    d. Concrete subcontractor.
    e. Special concrete finish subcontractor.
2. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, semirigid joint fillers, forms and form removal limitations, shoring and reshoring procedures, vapor-retarder installation, anchor rod and anchorage device installation tolerances, steel reinforcement installation, floor and slab flatness and levelness measurement, concrete repair procedures, and concrete protection.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage. Avoid damaging coatings on steel reinforcement.

B. Comply with ASTM C94/C94M and ACI 301

1.7 FIELD CONDITIONS

A. Cold-Weather Placement: Comply with ACI 301 (ACI 301M) and ACI 306.1 and as follows.
1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
2. When average high and low temperature is expected to fall below 40 deg F (4.4 deg C) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301 (ACI 301M).
3. Do not use frozen materials or materials containing ice or snow.
4. Do not place concrete in contact with surfaces less than 35 deg F (1.7 deg C), other than reinforcing steel.
5. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

B. Hot-Weather Placement: Comply with ACI 301 (ACI 301M) and ACI 305.1 (ACI 305.1M), and as follows:
1. Maintain concrete temperature at time of discharge to not exceed 95 deg F (35 deg C).
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

1.8 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to furnish replacement sheet vapor retarder/termite barrier material and accessories for sheet vapor retarder/ termite barrier and accessories that do not comply with requirements or that fail to resist penetration by termites within specified warranty period.
1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PRODUCTS GENERAL

A. VOC Content: Refer to Division 01 Section “Sustainability Design Requirements”.

B. All adhesives used inside the weatherproofing system must comply with Rule 1168 of the South Coast Air Quality Management District.

C. All caulks and sealants must comply with Regulation 8, Rule 51, of the Bay Area Air Quality Management District (BAAQMD).

2.2 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

1. Plywood, metal, or other approved panel materials.
2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and one of the following subject to approval by the architect:
    a. High-density overlay, Class 1 or better.
    b. Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.
    c. Structural 1, B-B or better; mill oiled and edge sealed.
    d. B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.

B. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.

C. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

D. Form Ties: Factory-fabricated, removable or snap-off metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
1. Form tie layout shall be approved by the architect for exposed concrete.
2. Furnish units that will leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
3. 3. Furnish ties that, when removed, will leave holes no larger than 1 inch in diameter in concrete surface.
4. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

2.3 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.

B. Low-Alloy-Steel Reinforcing Bars: ASTM A 706/A 706M, deformed.

C. Plain-Steel Wire: ASTM A 82/A 82M.

D. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain, fabricated from as-drawn steel wire into flat sheets.

2.4 REINFORCEMENT ACCESSORIES

A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60, plain-steel bars, cut true to length with ends square and free of burrs.

B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2.5 CONCRETE MATERIALS

A. ACI Publications: Comply with ACI 301 (ACI 301M) unless modified by requirements in the Contract Documents.

B. Provide products that were extracted, processed and manufactured within 500 miles of the project for a minimum of 50 percent, based on cost, of the building materials value.

C. Source Limitations:
1. Obtain all concrete mixtures from a single ready-mixed concrete manufacturer for entire Project.
2. Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant.
3. Obtain aggregate from single source.
4. Obtain each type of admixture from single source from single manufacturer.

D. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
1. Portland Cement: ASTM C 150, Type I or Type II, if recommended by the geotechnical report, provide Type V in all foundation concrete. Supplement with the following:
a. Fly Ash: ASTM C 618, Class F or C.
b. Slag Cement: ASTM C989/C989M, Grade 100 or 120.

E. Normal-Weight Aggregates: ASTM C 33, coarse aggregate or better, graded. Provide aggregates from a single source.
1. Maximum Coarse-Aggregate Size: 3/4 inch nominal for all concrete unless other sizes are required.
2. Maximum Coarse-Aggregate Size: 3/8 inch (9 mm) where clear bar spacings are less than 1 inch (25 mm) including splices or in slabs of total thickness, of 2 inches (51 mm) or less.
3. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

F. Water: ASTM C 94/C 94M and potable.

2.6 ADMIXTURES

A. Air-Entraining Admixture: ASTM C 260.

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

C. Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete and complying with ASTM C 494/C 494M, Type C.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
a. Axim Italcementi Group, Inc.; CATEXOL CN-CI.
b. BASF Construction Chemicals - Building Systems; Rheocrete CNI.
c. Euclid Chemical Company (The), an RPM company.
d. Grace Construction Products, W. R. Grace & Co.; DCI.
e. Sika Corporation; Sika CNI.

D. Non-Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, non-set-accelerating, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. BASF Construction Chemicals - Building Systems; Rheocrete 222+.
      b. Cortec Corporation; MCI- 2000, 2005NS.
      c. Grace Construction Products, W. R. Grace & Co.; DCI-S.
      d. Sika Corporation; FerroGard 901.

2.7 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
   1. Products: Subject to compliance with requirements and compatibility with floor coverings, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Axim Italcementi Group, Inc.; CATEXOL CimFilm.
      b. BASF Construction Chemicals - Building Systems; Confilm.
      c. ChemMasters; SprayFilm.
      d. Conspec by Dayton Superior; Aquafilm.
      e. Dayton Superior Corporation; Sure Film (J-74).
      f. Edoco by Dayton Superior; BurkeFilm.
      g. Euclid Chemical Company (The), an RPM company; Eucobar.
      h. Kaufman Products, Inc.; Vapor-Aid.
      i. Lambert Corporation; LAMBCO Skin.
      j. L&M Construction Chemicals, Inc.; E-CON.
      k. Meadows, W. R., Inc.; EVAPRE.
      l. Metalcrete Industries; Waterhold.
      m. Nox-Crete Products Group; MONOFILM.
      n. Sika Corporation; SikaFilm.
      o. SpecChem, LLC; Spec Film.
      p. Symons by Dayton Superior; Finishing Aid.
      q. TK Products, Division of Sierra Corporation; TK-2120 TRI-FILM.
      r. Unitex; PRO-FILM.
      s. Vexcon Chemicals, Inc.; Certi-Vex Envio Set.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.
   1. Products: Subject to compliance with requirements and compatibility with floor coverings, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Anti-Hydro International, Inc.; AH Curing Compound #2 DR WB.
      b. BASF Construction Chemicals - Building Systems; Kure 200.
      c. ChemMasters; Safe-Cure Clear.
      d. Conspec by Dayton Superior; W.B. Resin Cure.
      e. Dayton Superior Corporation; Day-Chem Rez Cure (J-11-W).
      f. Edoco by Dayton Superior; Res X Cure WB.

g. Euclid Chemical Company (The), an RPM company; Kurez W VOX; TAMMSCURE WB 30C.
h. Kaufman Products, Inc.; Thinfilm 420.
i. Lambert Corporation; AQUA KURE - CLEAR.
j. L&M Construction Chemicals, Inc.; L&M Cure R.
k. Meadows, W. R., Inc.; 1100-CLEAR.
l. Nox-Crete Products Group; Resin Cure E.
m. Right Pointe; Clear Water Resin.
n. SpecChem, LLC; Spec Rez Clear.
o. Symons by Dayton Superior; Resi-Chem Clear.
p. TK Products, Division of Sierra Corporation; TK-2519 DC WB.
q. Vexcon Chemicals, Inc.; Certi-Vex Enviocure 100.

F. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
a. BASF Construction Chemicals - Building Systems; Kure 1315.
b. ChemMasters; Polyseal WB.
c. Conspec by Dayton Superior; Sealcure 1315 WB.
d. Edoco by Dayton Superior; Cureseal 1315 WB.
e. Euclid Chemical Company (The), an RPM company; Super Diamond Clear VOX; LusterSeal WB 300.
f. Kaufman Products, Inc.; Sure Cure 25 Emulsion.
g. Lambert Corporation; UV Safe Seal.
h. L&M Construction Chemicals, Inc.; Lumiseal WB Plus.
i. Meadows, W. R., Inc.; Vocomp-30.
j. Metalcrete Industries; Metcure 30.
k. Right Pointe; Right Sheen WB30.
l. Symons by Dayton Superior; Cure & Seal 31 Percent E.
m. Vexcon Chemicals, Inc.; Vexcon Starseal 1315.

G. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction and, for interior paints and coatings applied at Project site, the following VOC limits, exclusive of colorants added to a tint base, when calculated according Division 01 Section “Sustainability Design Requirements”.
1. Floor Coatings: 250 g/L.

2.8 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.

B. Bond Breaker: No. 30 unperforated organic felt, complying with ASTM D 226, Type II.

C. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 or aromatic polyurea with a Type A shore durometer hardness range of 90 to 95 per ASTM D 2240.

D. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

E. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:

1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

F. Reglets: Fabricate reglets of not less than 0.022-inch- thick, galvanized-steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.

2.9 REPAIR MATERIALS

A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.
1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 maximum or coarse sand as recommended by underlayment manufacturer.
4. Compressive Strength: Not less than 4100 psi at 28 days when tested according to ASTM C 109/C 109M.

B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch and that can be filled in over a scarified surface to match adjacent floor elevations.
1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 5000 psi at 28 days when tested according to ASTM C 109/C 109M.

2.10 CONCRETE MIXTURES, GENERAL

A. Regional Materials: Concrete shall be manufactured within 500 miles of Project site from aggregates that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.
1. All major materials in the concrete mixes including but not limited to;
   a. Aggregate
   b. Portland cement
   c. Fly ash

B. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

C. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
1. Fly Ash: 25 percent, where permitted.

D. Limit water-soluble, chloride-ion content in hardened concrete to 0.06 percent by weight of cement.
1. Topping slab at breezeway corridor, refer to Drawings.

E. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing, high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
3. Use water-reducing admixture in pumped concrete, concrete for parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.
4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

2.11 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Retaining Walls: Proportion normal-weight concrete mixture as follows:
   1. Minimum Compressive Strength: As indicated on the drawings.
   2. Maximum Water-Cementitious Materials Ratio: As indicated on the drawings
   3. Slump Limit: As indicated on the drawings.
   4. Air Content: As indicated on the drawings.
   6. Fly ash not permitted.

B. Exterior Stoops and Stairs on Grade:
   1. Minimum Compressive Strength: 4500 psi at 28 days.
   2. Maximum Water-Cementitious Materials Ratio: 0.45.
   3. Slump Limit: 4 inches, plus or minus 1 inch.
   4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch nominal maximum aggregate size.
   5. Fly ash not permitted.

2.12 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.13 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116/C 1116M, and furnish batch ticket information.
   1. Mixing and delivery as measured from batch time to completion of discharge from truck shall not exceed 1 1/2 hours. When air temperature is above 90 deg F, reduce mixing, delivery time, and discharge to 60 minutes.

B. Project-Site Mixing: Not permitted.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:
   1. Before placing concrete, verify that installation of concrete forms, accessories, and reinforcement, and embedded items is complete and that required inspections have been performed.
   2. Do not proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide reasonable auxiliary services to accommodate field testing and inspections, acceptable to testing agency, including the following:
   1. Daily access to the Work.
   2. Incidental labor and facilities necessary to facilitate tests and inspections.
   3. Secure space for storage, initial curing, and field curing of test samples, including source of water and continuous electrical power at Project site during site curing period for test samples.
   4. Security and protection for test samples and for testing and inspection equipment at Project site.

3.3 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:
   1. Class A, 1/8 inch for smooth-formed finished surfaces.
   2. Class B, 1/4 inch for rough-formed finished surfaces.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
   1. Install keyways, reglets, recesses, and the like, for easy removal.
   2. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

H. Chamfer exterior corners and edges of permanently exposed concrete.

I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.4 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
   1. Install anchor rods or bolts, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."
   2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

B. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations and curing and protection operations need to be maintained.

C. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

D. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.5 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
   1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
   1. Weld reinforcing bars according to AWS D1.4/D 1.4M, where indicated.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one closed mesh spacing, but not less than 6 inches (153 mm). Offset laps of adjoining sheet widths to prevent continuous laps in either direction.

3.6 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
   1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.

2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
5. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction Joints in Slabs-on-Grade: (Non post-tensioned) Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness by one of the following methods:
1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface, but more than 18 hours after placement.

D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler or bond breakers strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants, specified in Division 07 Section "Joint Sealants," are indicated.
3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.7 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.

C. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

D. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
   1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
   2. Maintain reinforcement in position on chairs during concrete placement.
   3. Screed slab surfaces with a straightedge and strike off to correct elevations.
   4. Slope surfaces uniformly to drains where required.
   5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

E. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
   1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
   2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
   3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

F. Hot-Weather Placement: Comply with ACI 301 and as follows:
   1. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
   2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.8 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
   1. Apply to concrete surfaces not exposed or where indicated.

B. Decorative Formed Board Formed Concrete, match sample, remove tie holes, defects.

C. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
   1. Apply to exposed concrete surfaces or those to receive a rubbed finish, or to be covered with a coating or covering material applied directly to concrete.

D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.9 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch in one direction.
   1. Apply scratch finish to surfaces indicated and to receive concrete floor toppings or to receive mortar setting beds for bonded cementitious floor finishes.

C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.
   1. Apply float finish to surfaces indicated and to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.

D. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
   1. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
   2. Finish surfaces to the following tolerances, according to ASTM E 1155, for a randomly trafficked floor surface:
      a. Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17; for slabs-on-grade.
   3. Finish and measure surface so gap at any point between concrete surface and an unleveled, freestanding, 10-ft.- long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/8 inch.

E. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces indicated or where ceramic or quarry tile is to be installed by either thickset or thin-set method. While concrete is still plastic, slightly scarify surface with a fine broom.
   1. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.

F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.
   1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

3.10 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.

3.11 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
   1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
      a. Water.
      b. Continuous water-fog spray.
      c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
   2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
      a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
      b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
      c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.
   3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
      a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project.
   4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.12 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
   1. Defer joint filling until concrete has aged at least one month. Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.
   1. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches (50 mm) deep in formed joints.
   2. Overfill joint, and trim joint filler flush with top of joint after hardening.

3.13 TOLERANCES

A. Conform to ACI 117 (ACI 117M).

3.14 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
   1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete. Limit cut depth to 3/4 inch. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
   2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
   3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness.
   1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
   2. After concrete has cured at least 14 days, correct high areas by grinding.
   3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
   4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
   5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
   6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and

expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar or semi-rigid joint filler as directed by the Architect. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.15 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Inspections:
1. Steel reinforcement placement.
2. Steel reinforcement welding.
3. Headed bolts and studs.
4. Verification of use of required design mixture.
5. Concrete placement, including conveying and depositing.
6. Curing procedures and maintenance of curing temperature.
7. Verification of concrete strength before removal of shores and forms from beams and slabs.

C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.
2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; ASTM C 173/C 173M, volumetric method, for structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
5. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
6. Compression Test Specimens: ASTM C 31/C 31M.
   a. Cast and laboratory cure one set of four standard cylinder specimens for each composite sample.
   b. Cast and field cure two additional standard cylinder specimens for early testing of post-tensioned concrete prior to stressing.
7. Compressive-Strength Tests: ASTM C 39/C 39M.
   a. For non post-tensioned concrete, test one lab cured specimen at 7 days and two lab-cured specimens at 28 days, hold one in reserve.
   b. For post-tensioned concrete, test one field cured specimen at age required by contractor’s stressing schedule, hold second field cured specimen in reserve for subsequent testing, if

required. Test one lab cured specimen at 7 days and two lab-cured specimens at 28 days, hold one in reserve

c. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.

8. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no single compressive-strength test value falls below specified compressive strength by more than 500 psi.
9. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
10. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
11. Additional Tests: Testing and inspecting agency shall make additional tests of concrete, at contractor's expense, when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
12. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
13. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

D. Concrete Cast Underlayment Substrates: Prepare according to ASTM F 710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
4. Moisture Testing: Perform tests recommended by floor covering manufacturer and as follows. Proceed with installation only after substrates pass testing.
   a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 5 lb of water/1000 sq. ft. in 24 hours.
   b. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 80 percent relative humidity level measurement.
5. Confirm tolerance numbers with flooring manufacturers.

E. Measure floor and slab flatness and levelness according to ASTM E 1155 within 48 hours of finishing.

3.16 PROTECTION

A. Protect concrete surfaces as follows:

1. Protect from petroleum stains.
2. Diaper hydraulic equipment used over concrete surfaces.
3. Prohibit vehicles from interior concrete slabs.
4. Prohibit use of pipe-cutting machinery over concrete surfaces.
5. Prohibit placement of steel items on concrete surfaces.
6. Prohibit use of acids or acidic detergents over concrete surfaces.

7. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.

END OF SECTION 033000

SECTION 033520 - CONCRETE FINISHING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Concrete sealer

B. Refer to Division 03 Section “Cast-In Place Concrete” for balance of information on concrete formed finishes

1.2 SUBMITTALS

A. Product Data: For type of manufactured material and product indicated.

B. Material Certificates: Signed by manufacturers certifying compliance of floor and slab treatments.

C. Maintenance Data: Provide manufacturer’s instructions for maintenance of installed work, including methods and frequency recommended for maintaining optimum condition under intended use. These instructions should contain precautions against cleaning products and methods, which may be detrimental to finishes and performance.

1.3 QUALITY ASSURANCE

A. Coordination; Verify compliance between all components of system prior to the application.

B. Applicator Qualifications: Engage an experienced applicator who employs only persons trained and approved by concrete sealer manufacturer for application of manufacturer's products.

C. Source Limitations: Obtain each specified material from same source and maintain high degree of consistency in workmanship throughout Project

D. Slip Resistance: Static coefficient of friction shall be 0.6 for level floors and 0.8 for ramped surfaces as recommended by the ADA Accessibility Guidelines (ADAAG).
   1. Testing shall be in accordance with ASTM C 1028 or use of similar devices recognized by ADAAG.

E. Static Coefficient of Friction: A reading of not less than 0.5 for level floor surfaces shall be achieved and documented, as determined by certified an NFSI walkway auditor using the NFSI 101-A quality control test.

F. Field Sample Panels for Concrete Polish: After approval of samples, produce field sample panels to demonstrate the approved range of selections made under Sample submittals. Produce a minimum of three sets of full-scale panels, approximately 48 by 48 inches minimum, to demonstrate the expected range of finish, color, and appearance variations.
   1. Locate panels as indicated or, if not indicated, as directed by Architect.
   2. Maintain field sample panels during construction in an undisturbed condition as a standard for judging the completed Work.
   3. Demolish and remove field sample panels when directed.

1.4 WARRANTY

A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

B. Special Warranty: Submit a written warranty, executed by the applicator and concrete sealer manufacturer, covering materials and labor, agreeing to repair or replace materials that fail to provide water repellency within the specified warranty period. Warranty does not include deterioration or failure of coating due to unusual weather phenomena, failure of prepared and treated substrate, formation of new joints and cracks in excess of 1/16 inch wide, fire, vandalism, or abuse by maintenance equipment.

PART 2 - PRODUCTS

2.1 CONCRETE SEALER and DENSIFIER

A. Clear, chemically reactive, waterborne solution of inorganic lithium silicate or siliconate materials and proprietary components; odorless; colorless; that penetrates, hardens, and densifies concrete surfaces.
   1. Available Products:
      a. US Spec; Permalith
      b. Laticrete International Inc; L&M Sealhard.
      c. Prosoco; Consolideck LS

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean substrate of substances that might interfere with penetration or performance of concrete sealer. Test for moisture content, according to sealer manufacturer's written instructions, to ensure surface is sufficiently dry.
   1. Formed Concrete: Remove oil, curing compounds, laitance, and other substances that could prevent adhesion or penetration of concrete sealers.

B. Repair cracks and joints in accordance with manufacturers recommendations

C. Protect adjoining work, including sealant bond surfaces, from spillage or blow-over of concrete sealer. Cover adjoining and nearby surfaces of aluminum and glass if there is the possibility of concrete sealer being deposited on surfaces. Cover live plants and grass.

D. Coordination with Sealants: Do not apply concrete sealer until sealants for joints adjacent to surfaces receiving water-repellent treatment have been installed and cured.
   1. Water-repellent work may precede sealant application only if sealant adhesion and compatibility have been tested and verified using substrate, concrete sealer, and sealant materials identical to those used in the work.

E. Moisture Vapor and Alkalinity Testing
   1. Test existing concrete floors for alkalinity/pH, according to method indicated in ASTM F710. Acceptable results: pH between 9 and 10.
   2. Test existing concrete for moisture vapor transmission according to methods indicated in ASTM F1869. Acceptable results: not more than 5 pounds per 1,000 square feet in 24 hours.
   3. Test existing concrete for relative humidity using in situ probes according to ASTM F2170. Acceptable results: not more than 80 percent.

4. Verify tolerances with flooring manufacturer.

3.2 APPLICATION OF SEALER

A. Newly placed concrete should not receive sealer prior to 7 days cure time. Apply a moderate-saturation spray coating of concrete sealer on surfaces indicated for treatment using low-pressure spray equipment. Immediately work sealer into surface until product begins to form a gel. Squeegee or vacuum off excess material, leaving no puddles of sealer.

B. Confirm location of sealer with Architect.

3.3 CLEANING

A. Protective Coverings: Remove protective coverings from adjacent surfaces and other protected areas.

B. Immediately clean concrete sealer from adjoining surfaces and surfaces soiled or damaged by water-repellent application as work progresses. Repair damage caused by water-repellent application. Comply with manufacturer's written cleaning instructions.

END OF SECTION 033520

SECTION 035413 - GYPSUM CEMENT UNDERLAYMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes gypsum-cement-based, self-leveling underlayment for application below interior floor coverings.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.
   1. Provide documentation that have been manufactured within 500 miles of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.
   2. Include a statement from the manufacturer indicating the percentage of recycled content of each product used.
   3. For paints and coatings applied inside the weather barrier of the project, submit manufacturer's product data or Material Safety Data Sheet (MSDS) showing printed statement of VOC content in grams per liter (g/L).Product certificates.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: Installer who is approved by manufacturer for application of underlayment products required for this Project.

B. Product Compatibility: Manufacturers of underlayment and floor-covering systems certify in writing that products are compatible.

PART 2 - PRODUCTS

2.1 GYPSUM-CEMENT-BASED UNDERLAYMENTS

A. Underlayment: Gypsum-cement-based, self-leveling product that can be applied in minimum uniform thickness that can be feathered at edges to match adjacent floor elevations.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Allied Custom Gypsum; AccuCrete.
      b. Euclid Chemical Company (The); Flo-Top.
      c. Maxxon Corporation; Gyp-Crete 2000.
      d. USG Corporation; Levelrock 3500.
   2. Cement Binder: Gypsum or blended gypsum cement as defined by ASTM C 219.
   3. Compressive Strength: Not less than 2000-3500 psi at 28 days when tested according to ASTM C 109/C 109M.
   4. Underlayment Additive: Resilient-emulsion product of underlayment manufacturer, formulated for use with underlayment when applied to substrate and conditions indicated.
   5. Thickness: refer to Drawings

B. Sound Control Mat: Moisture-resistant fabric-faced entangled nylon filament mat.
   1. Thickness: 1/4-inch.
   2. Basis-of-Design Product: Provide Maxxon Corporation; Acousti-Mat 1/4 or comparable product acceptable to Architect.

C. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch; or coarse sand as recommended by underlayment manufacturer.
   1. Provide aggregate when recommended in writing by underlayment manufacturer for underlayment thickness required.

D. Water: Potable and at a temperature of not more than 70 deg F.

E. Primer: Product of underlayment manufacturer recommended in writing for substrate, conditions, and application indicated.

2.2 ACCESSORIES

A. Latex modified cement based floor patch product:
   1. Chapco Patch; H.B. Fuller Construction Products Inc.

PART 3 - EXECUTION

3.1 PREPARATION

A. General: Prepare and clean substrate according to manufacturer's written instructions.
   1. Treat nonmoving substrate cracks to prevent cracks from telegraphing (reflecting) through underlayment.
   2. Fill substrate voids to prevent underlayment from leaking.

B. Concrete Substrates: Mechanically remove laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants that might impair underlayment bond.
   1. Moisture Testing: Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates do not exceed a maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.

C. Wood Substrates: Mechanically fasten loose boards and panels to eliminate substrate movement and squeaks. Sand to remove coatings that might impair underlayment bond and remove sanding dust.

D. Nonporous Substrates: For ceramic tile, quarry tile, and terrazzo substrates, remove waxes, sealants, and other contaminants that might impair underlayment bond, and prepare surfaces.

E. Adhesion Tests: After substrate preparation, test substrate for adhesion with underlayment.

3.2 APPLICATION

A. General: Mix and apply underlayment components according to manufacturer's written instructions.
   1. Close areas to traffic during underlayment application and for time period after application recommended in writing by manufacturer.
   2. Coordinate application of components to provide optimum underlayment-to-substrate and intercoat adhesion.
   3. At substrate expansion, isolation, and other moving joints, allow joint of same width to continue through underlayment.

B. Apply primer over prepared substrate at manufacturer's recommended spreading rate.

C. Apply underlayment to produce uniform, level surface.
   1. Apply a final layer without aggregate to product surface.
   2. Feather edges to match adjacent floor elevations.

D. Cure underlayment. Prevent contamination during application and curing processes.

E. Do not install floor coverings over underlayment until after time period recommended in writing by underlayment manufacturer.

F. Remove and replace underlayment areas that evidence lack of bond with substrate, including areas that emit a "hollow" sound when tapped.

G. Trowel on latex modified floor patch over underlayment at all locations where LVT is to be installed, refer to Drawings. In thickness as recommended by manufacturer.

END OF SECTION 035413

SECTION 042000 - UNIT MASONRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Concrete masonry units (CMU's).
   2. Steel reinforcing bars.

1.2 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Owner will engage a qualified independent testing agency to perform preconstruction testing indicated below. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.
   1. Concrete Masonry Unit Test: For each type of unit required, according to ASTM C 140 for compressive strength.
   2. Mortar Test (Property Specification): For each mix required, according to ASTM C 109/C 109M for compressive strength ASTM C 1506 for water retention, and ASTM C 91 for air content.
   3. Mortar Test (Property Specification): For each mix required, according to ASTM C 780 for compressive strength.
   4. Grout Test (Compressive Strength): For each mix required, according to ASTM C 1019.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For reinforcing steel. Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement."

C. Samples: For each type and color of exposed masonry unit.

1.4 INFORMATIONAL SUBMITTALS

A. Material Certificates: For each type and size of product indicated. For masonry units include data on material properties material test reports substantiating compliance with requirements.

B. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
   1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91 for air content.
   2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.

1.5 QUALITY ASSURANCE

A. Masonry Standard: Comply with ACI 530.1/ASCE 6/TMS 602 and 402 unless modified by requirements in the Contract Documents.

B. Sample Panels: Build sample panels to verify selections made under sample submittals and to demonstrate aesthetic effects. Comply with requirements in Section 014000 "Quality Requirements" for mockups.
   1. Build sample panels for each type of exposed unit masonry construction in sizes approximately 48 inches long by 36 inches high by full thickness.

1.6 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project Site, invite Technical Representative from Rocky Mountain Masonry Institute (RMMI) to review and discuss construction standards and expectations with sub contractors.

1.7 PROJECT CONDITIONS

A. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602 and 402.

B. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602 and 402.

PART 2 - PRODUCTS

2.1 MASONRY UNITS, GENERAL

A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects will be exposed in the completed Work.

B. Fire-Resistance Ratings: Where indicated, provide units that comply with requirements for fire-resistance ratings indicated as determined by testing according to ASTM E 119, by equivalent masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

2.2 CONCRETE MASONRY UNITS

A. Shapes: Provide shapes indicated and for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.

B. CMUs: ASTM C 90.
   1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2800 psi
   2. Density Classification: Light weight unless otherwise indicated.
   3. Size: 8 inches.
      a. Chamfer edge blocks, at accent coursing, refer to Drawings.
   4. Finish: Smooth
   5. Color: As selected.
   6. Water-repelling where exposed. Grout fill solid and reinforce per plans.

2.3 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

B. Hydrated Lime: ASTM C 207, Type N.

C. Masonry Cement: ASTM C 91.

D. Aggregate for Mortar: ASTM C 144.
1. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.
2. White-Mortar Aggregates: Natural white sand or crushed white stone.

E. Aggregate for Grout: ASTM C 404.

F. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.

G. Water: Potable.

2.4 REINFORCEMENT

A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60.

B. Masonry Joint Reinforcement, General: ASTM A 951/A 951M.
1. Interior Walls: Hot-dip galvanized, carbon steel.
2. Wire Size for Side Rods: 9 gauge
3. Wire Size for Cross Rods: 9 gauge
4. Wire Size for Veneer Ties: 9 gauge
5. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches o.c.
6. Provide in lengths of not less than 10 feet, with prefabricated corner and tee units.

C. Masonry-Joint Reinforcement for Veneers Anchored with Masonry-Veneer Anchors: Single 0.187-inch-diameter, hot-dip galvanized carbon steel continuous wire.

D. Masonry Joint Reinforcement for Single-Wythe Masonry: Either ladder or type with single pair of side rods.

2.5 TIES AND ANCHORS

A. General: Ties and anchors shall extend at least 1-1/2 inches into veneer but with at least a 5/8-inch cover on outside face.

B. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated.
1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82/A 82M; with ASTM A 153/A 153M, Class B-2 coating.
2. Steel Sheet, Galvanized after Fabrication: ASTM A 1008/A 1008M, Commercial Steel, with ASTM A 153/A 153M, Class B coating.
3. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

C. Adjustable Masonry-Veneer Anchors:

1. General: Provide anchors that allow vertical adjustment but resist tension and compression forces perpendicular to plane of wall, for attachment over sheathing to wood or metal studs, and as follows:
   a. Structural Performance Characteristics: Capable of withstanding a 100-lbf load in both tension and compression without deforming or developing play in excess of 0.05 inch.
2. Wire Ties: Triangular-, rectangular-, or T-shaped wire ties fabricated from 0.187-inch- diameter, hot-dip galvanized steel wire.
3. Confirm appropriate size of anchor to accommodate continuous insulation thickness.

D. Partition Top anchors: 0.105-inch- thick metal plate with 3/8-inch- diameter metal rod 6 inches long welded to plate and with closed-end plastic tube fitted over rod that allows rod to move in and out of tube. Fabricate from steel, hot-dip galvanized after fabrication.

E. Wire Ties, General: Unless otherwise indicated, size wire ties to extend at least halfway through veneer but with at least 5/8-inch cover on outside face. Outer ends of wires are bent 90 degrees and extend 2 inches parallel to face of veneer.

F. Rigid Anchors: Fabricate from steel bars 1-1/2 inches wide by 1/4 inch thick by 24 inches long, with ends turned up 2 inches or with cross pins unless otherwise indicated.
   1. Corrosion Protection: Hot-dip galvanized to comply with ASTM A 153/A 153M .

G. Anchor Bolts: Headed or L-shaped steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153/A 153M, Class C; of dimensions indicated.

2.6 EMBEDDED FLASHING MATERIALS

A. Self Adhering Flexible flashing:
   1. Products of manufacturers listed below meeting indicated standards and specified manufacturer's product data characteristics, except as modified below, are acceptable for use, subject to compliance with specified requirements.
      a. Product standard of quality:
         1) York Manufacturing, Inc.; York 304 SS
         2) Illinois Products, Inc.; IPCO Self-Adhesive Stainless Steel
         3) STS Coatings, Inc.; Wall Guardian Self Adhering Stainless Steel Flashing
         4) TK Products, Inc.; TK Self-Adhering Stainless Steel TWF
         5) Vapro Shield, Inc.; VaproThru-Wall Flashing SA
         6) Other products that meet the criteria in section 1.04 to 1.06.
   2. Characteristics:
      a. Type: stainless steel core with one uncoated (bare) stainless steel face (outward facing) with a butyl block co-polymer adhesive (inward facing).
      b. Stainless steel: type 304, ASTM A240. Domestically sourced per DFARS 252.225-7008 and/or DFARS 252.225-7009.
      c. Adhesive: block co-polymer
      d. Size: Manufacturer's standard width rolls.
   3. Accessories:
      a. Polyether sealant:
         1) York Manufacturing, Inc.; UniverSeal US-100
         2) STS Coatings; GreatSeal LT-100
         3) Prosoco, Inc.; R-Guard Joint Seam Sealer
      b. Splice Tape:
         1) York Manufacturing, Inc.; York 304 SS
         2) Illinois Products, Inc.; IPCO Self Adhering Stainless Steel Flashing

c. Corner and End Dams: form the stainless steel flashing in the field or use 26 gauge stainless steel pre-manufactured corners.
d. Mortar deflection: polyester strands that will not degrade and will keep weep vents from clogging with mortar.
   1) York Manufacturing; Weep-Armor
   2) Or approved comparable product
e. Termination bar: rigid PVC or stainless steel termination bar with sealant catch lip
   1) York Manufacturing; T-96 termination bar
   2) York Manufacturing; SS Term Bar

B. Single-Wythe CMU Flashing System: System of CMU cell flashing pans and interlocking CMU web covers made from high-density polyethylene incorporating chemical stabilizers that prevent UV degradation. Cell flashing pans have integral weep spouts that are designed to be built into mortar bed joints and weep collected moisture to the exterior of CMU walls and that extend into the cell to prevent clogging with mortar.

C. Solder and Sealants for Sheet Metal Flashings: As specified in Division 07 Section "Sheet Metal Flashing and Trim."

D. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

2.7 MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; formulated from neoprene urethane or PVC.

B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 or PVC, complying with ASTM D 2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

C. Connectors at Intersecting Shear Walls (not applicable at corners):
1. Rigid Z-strap Anchors: Fabricate from ASTM A 36 steel bars, 1-1/2 inches by 1/4 inch by 24 inches long with ends turned up 2 inches (total 28 inches in length).

D. Connectors for Intersecting Non-Shear Walls (not applicable at corners):
1. Wire Mesh Ties: Fabricate from 1/2 inch by 1/2 inch mesh, 16 gauge, in width 2 inches less than nominal thickness of the unit masonry wythe and length not less than 14 inches. Hot dip galvanized, ASTM A 153 Class B-2.

E. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

2.8 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
1. Do not use calcium chloride in mortar or grout.
2. For reinforced masonry, use portland cement-lime masonry cement or mortar cement mortar.
3. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.

B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.

C. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated.
   1. For masonry below grade or in contact with earth, use Type M.
   2. For reinforced masonry, use Type S.
   3. For interior non-load bearing partitions, use Type N.

D. Grout for Unit Masonry: Comply with ASTM C 476.
   1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
   2. Proportion grout in accordance with ASTM C 476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 3000 psi.
   3. Provide grout with a slump of 8 to 11 inches 10 to 11 inches as measured according to ASTM C 143/C 143M.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

B. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.

C. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested per ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.

3.2 TOLERANCES

A. Dimensions and Locations of Elements:
   1. For dimensions in cross section or elevation do not vary by more than plus 1/2 inch or minus 1/4 inch.
   2. For location of elements in plan do not vary from that indicated by more than plus or minus 1/2 inch.
   3. For location of elements in elevation do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2 inch total.

B. Lines and Levels:
   1. For bed joints and top surfaces of bearing walls do not vary from level by more than 1/4 inch in 10 feet, or 1/2 inch maximum.
   2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.
   3. For vertical lines and surfaces do not vary from plumb by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2 inch maximum.

4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.
5. For lines and surfaces do not vary from straight by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2 inch maximum.

C. Joints:
1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch.
2. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch or minus 1/4 inch.
3. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch.

3.3 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface running bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
1. Notify architect of discrepancies

B. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

C. Refer to Drawings for pattern for exposed masonry.
1. Bond Pattern:
a. For single wythe, lay exposed masonry in running bond; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
2. Stacked Bond : Do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.

D. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

E. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below and rod mortar or grout into core.

F. Fill cores in hollow unit masonry with grout, stair cores, 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

3.4 MORTAR BEDDING AND JOINTING

A. Lay hollow CMUs as follows:
1. With face shells fully bedded in mortar and with head joints of depth equal to bed joints.
2. With webs fully bedded in mortar in all courses of piers, columns, and pilasters.
3. With webs fully bedded in mortar in grouted masonry, including starting course on footings.
4. With entire units, including areas under cells, fully bedded in mortar at starting course on footings where cells are not grouted.

B. For Construction Joints, Comply with BIA Technical Note 28B, space a maximum of 30ft, refer to Drawings for locations.

C. Lay brick as follows:
   1. With face shells fully bedded in mortar and with head joints of depth equal to bed joints.
   2. With entire units, including areas under cells, fully bedded in mortar at starting course on footings where cells are not grouted.

D. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

E. Rake out mortar joints at pre-faced CMUs and glazed brick to a uniform depth of 1/4 inch (6 mm) and point with epoxy mortar to comply with epoxy-mortar manufacturer's written instructions.

F. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.

3.5 MASONRY JOINT REINFORCEMENT

A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches.
   1. Space reinforcement not more than 16 inches o.c.
   2. Provide reinforcement not more than 8 inches above and below wall openings and extending 12 inches beyond openings in addition to continuous reinforcement.

B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.

C. Provide continuity at wall intersections by using prefabricated T-shaped units.

D. Provide continuity at corners by using prefabricated L-shaped units, as indicated, but not more than 24 inches o.c. vertically and 36 inches o.c. horizontally.

3.6 REINFORCED UNIT MASONRY INSTALLATION

A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
   1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
   2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other loads that may be placed on them during construction.

B. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602 and 402.

C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
   1. Comply with requirements in ACI 530.1/ASCE 6/TMS 602 and 402 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
   2. Limit height of vertical grout pours to not more than 60 inches.

3.7 ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE

A. Anchor masonry to structural steel and concrete where masonry abuts or faces structural steel or concrete to comply with the following:

1. Provide an open space not less than 1 inches wide, between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.
   a. Space varies, refer to Drawings for open air space dimension.
2. Anchor masonry with anchors embedded in masonry joints and attached to structure.
3. Space anchors as indicated, but not more than 24 inches o.c. vertically and 36 inches o.c. horizontally.

3.8 ANCHORING MASONRY VENEERS

A. Anchor masonry veneers to wall framing with masonry-veneer anchors to comply with the following requirements:
   1. Seal fastener penetrations, apply a piece of self adhering flashing material at each tie location.
   2. Fasten screw-attached anchors through sheathing to wall framing with metal fasteners of type indicated. Use two fasteners unless anchor design only uses one fastener.
   3. Embed tie sections in masonry joints. Provide not less than 2 inches of air space between back of masonry veneer and face of sheathing.
   4. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
   5. Space anchors as indicated, but not more than 16 inches o.c. vertically and 24 inches o.c. horizontally with not less than 1 anchor for each 3.5 sq. ft. of wall area. Install additional anchors within 12 inches of openings and at intervals, not exceeding 36 inches, around perimeter.

3.9 FLASHING, WEEP HOLES, DRAINAGE CAVITY AND VENTS

A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated. Install vents at shelf angles, ledges, and other obstructions to upward flow of air in cavities, and where indicated.

B. Flexible Flashing:
   1. Install where indicated, specified, or required in accord with flashing manufacturer's written instructions and as follows.
      a. Prohibited practice: Tucking the flashing into the backer wall.
      b. Prohibited practice: Bonding or splicing to non-woven drainage fabric.
   2. Extend flashing 6 inches minimum beyond opening. Fold flashing ends at end of openings or horizontal flashing terminations to form end dam or use pre-manufactured units made of 26 gauge stainless steel.
   3. Flashing width: Width required starting flush with outside face of exterior wythe, extending through cavity, rising height required to extend above lintel steel at least 2 inches.
   4. Splice end joints by overlapping them a minimum of 2 inches and seal with a compatible sealant or metal splice tape.
   5. Masonry/Concrete back up:
      a. Surface apply after damp proofing/air/weather barrier installation specified in damp proofing Section in accord with manufacturer’s installation instructions.
      b. Fasten to concrete back-up surface at top by embedding in layer of sealant and use a termination bar to fasten to the backer wall and seal the top of the termination bar with sealant.
   6. Stud back up with sheathing:
      a. Fasten to stud back-up surface at top by embedding in layer of sealant and use a termination bar to fasten to the backer wall and seal the top of the termination bar with sealant.
   7. Confirm compatibility with manufacturer’s mutual letters for all lapping components, air/weather barrier installation lapping and tapping over flashing top in the air/barrier barrier.
   8. Lay flashing in continuous bead of sealant on masonry supporting steel.

9. Fold ends of flashing at end of opening to form dam; seal with sealant or utilize preformed end dams from manufacturer.
10. Inside corners: Make in manufacturers accepted manner using corner and splice material or utilize preformed corners from manufacturer.
11. Outside corners: Make in manufacturers accepted manner using corner and splice material or utilize preformed corners from manufacturer.
12. Use stainless steel or copper drip edge any location that the underside of the flashing will be exposed and/or deemed necessary by the design professional or AHJ on the project.
13. Cover flashing within a few days of installation to protect it from damage from the different trades, the environment and falling debris. If flashing is left unprotected and it is punctured, torn, or has loose scrim you should contact the manufacturer for repair instructions.

C. Weeps, refer to BIA Technical Note, 7, weep vents at 24” o.c.

D. Install single-wythe CMU flashing system in bed joints of CMU walls where indicated to comply with manufacturer's written instructions. Install CMU cell pans with upturned edges located below face shells and webs of CMUs above and with weep spouts aligned with face of wall. Install CMU web covers so that they cover upturned edges of CMU cell pans at CMU webs and extend from face shell to face shell.
1. Refer to National Concrete Masonry Association TEK 19-2B Figures 3 and 4.

3.10 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas, as needed to perform tests and inspections. Retesting of materials that fail to meet specified requirements shall be done at Contractor's expense.

B. Inspections: Level B special inspections according to the "International Building Code."
1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
3. Place grout only after inspectors have verified proportions of site-prepared grout.

C. Testing Prior to Construction: One set of tests.

D. Testing Frequency: One set of tests for each 5000 sq. ft. of wall area or portion thereof.

E. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C 140 for compressive strength.

F. Mortar Test (Property Specification): For each mix provided, according to ASTM C 780. Test mortar for mortar air content and compressive strength.

G. Grout Test (Compressive Strength): For each mix provided, according to ASTM C 1019.

3.11 REPAIRING, POINTING, AND CLEANING

A. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

B. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes.
2. Protect surfaces from contact with cleaner.
3. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
4. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
5. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.
6. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.

3.12 MASONRY WASTE DISPOSAL

A. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.
   1. Do not dispose of masonry waste as fill within 18 inches of finished grade.

B. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 042000

SECTION 047200 - CAST STONE MASONRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes cast stone.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated. Include dimensions and finishes.

B. Sustainable Submittals:

C. Shop Drawings: Show fabrication and installation details for cast stone units. Include dimensions, details of reinforcement and anchorages if any, and indication of finished faces.

D. Samples:
1. For each color and texture of cast stone required.
2. For colored mortar.

E. Qualification Data: For manufacturer.

F. Material Test Reports: For each mix required to produce cast stone, based on testing according to ASTM C 1364, including test for resistance to freezing and thawing.

1.3 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer of cast stone units similar to those indicated for this Project, that has sufficient production capacity to manufacture required units, and is a plant certified by the Cast Stone Institute.

1.4 PROJECT CONDITIONS

A. Maintain manufacturer’s recommended environmental conditions to ensure optimum results.

B. Cold Weather Requirements: Installations should be performed in temperatures exceeding 40 degrees Fahrenheit prior to, during and for 48 hours after completion of work. If temperatures are below 40 degrees Fahrenheit, masons should use heaters and tents during the installation process to regulate temperature.

C. Hot Weather Requirements: If temperatures exceed 90 degrees Fahrenheit during the installation, additional moisture will need to be added to the backs of the stone veneer and scratch coated surface. Shade and/or frequent misting of the wall and stone may be required

1.5 WARRANTY

A. Manufacturer warrants cast stone for a period of fifty years against manufacturing defects when used on structures conforming to local building codes and when installed in accordance with manufacturers written instructions.
   1. Warranty coverage specifically excludes damage resulting from wall movement, settlement of the building, contact with chemicals or paint, discoloration due to contaminates, staining or oxidation.
   2. Warranty coverage is limited to replacement or repair of defective materials only and does not cover labor to remove or replace materials. Warranty coverage is limited to the original purchaser.

PART 2 - PRODUCTS

2.1 CAST STONE UNITS

A. Basis of Design: Subject to compliance with requirements, provide products as manufactured by Eldorado Stone.
   1. Pattern: Cliffstone
   2. Color: Whitebark
   3. Size: As selected on Drawings.

B. Manufactured Stone Veneer - Properties: Units consisting of Portland cement, lightweight aggregates and oxide pigments.
   1. Compressive Strength: Tested in accordance with ASTM C39 and ASTM C192, greater than 1800 psi.
   2. Shear Bond Test: Tested in accordance with ASTM C482, greater than 50 psi.
   3. Freeze / Thaw: Tested in accordance with ASTM C67, less than 3% mass loss.
   4. Unit Weight: Shipping weight is less than 15 lbs. per sq ft, density is determined in accordance with ASTM C567.

C. Install caps on walls according to Cast Stone Institute Design Tips Technical Bulletin #42 and BIA Technical Note #7.

D. Shapes: Outside corners, headers and jambs in addition to those indicated on drawings.

E. Provide cast stone units complying with ASTM C 1364 using either the vibrant dry tamp or wet-cast method.
   1. Provide units that are resistant to freezing and thawing as determined by laboratory testing according to ASTM C 666/C 666M, Procedure A, as modified by ASTM C 1364.
   2. Slope exposed horizontal surfaces 1:12 to drain unless otherwise indicated.
   3. Provide drips on projecting elements unless otherwise indicated.

F. Cure units as follows:
   1. Cure units in enclosed moist curing room at 95 to 100 percent relative humidity and temperature of 100 deg F for 12 hours or 70 deg F for 16 hours.
   2. Keep units damp and continue curing to comply with one of the following:
      a. No fewer than five days at mean daily temperature of 70 deg F or above.
      b. No fewer than six days at mean daily temperature of 60 deg F or above.
      c. No fewer than seven days at mean daily temperature of 50 deg F or above.
      d. No fewer than eight days at mean daily temperature of 45 deg F or above.

G. Acid etch units after curing to remove cement film from surfaces to be exposed to view.

2.2 ACCESSORIES

A. Anchors and Fasteners: Type and size indicated, fabricated from steel complying with ASTM A 36/A 36M, and hot-dip galvanized to comply with ASTM A 123/A 123M.

B. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner, expressly approved for intended use by cast stone manufacturer and cleaner manufacturer.

C. Bonding Agent: Complying with ASTM C 932, and as recommended by manufacturer.

D. Weather Barrier: Refer to Division 07 Section “Weatehr Barriers”.

E. Lath: complying with code agency requirements for the type of substrate over which stone veneer is installed.
   1. ASTM C 847, 2.5lb/yd2 (1.4kg/m2) galvanized expanded metal lath.
   2. ASTM C 847, 3.4lb (1.8 kg/m2) galvanized 3/8 inches rib lath.
   3. ASTM C 1032, 17 gauge (1.3 mm) woven wire mesh.
   4. ASTM C933 Welded Wire Lath.

2.3 MORTAR

A. Cement: Portland cement complying with ASTM C 1329.

B. Lime: ASTM C 207.

C. Sand: ASTM C 144, natural or manufactured sand.

D. Color Pigment: ASTM C 979, mineral oxide pigments.

E. Water: Potable.

F. Pre-Packaged Latex-Portland Cement Mortar: ANSI A118.4.

2.4 MORTAR Mixes

A. A. Jointless/Dry-Stacked Installation:
   1. Polymer modified mortar complying with ANSI A118.4
   2. Mortar prepared to comply with ASTM C270. Type S mortar.
      a. Add color pigment in accordance with pigment manufacturer’s instructions.

2.5 SOURCE QUALITY CONTROL

A. Engage a qualified independent testing agency to sample and test cast stone units according to ASTM C 1364.
   1. Include one test for resistance to freezing and thawing.

PART 3 - EXECUTION

3.1 ADHERED THIN STONE VENEER

A. Comply with manufacturers requirements and ASTM C 1780.

B. Refer to Standards as published by the Cast Stone Institute (in collaboration with TMS) for additional requirements as they relate to project conditions and design.
   1. On exterior walls masonry should be held a minimum of 4 inches above grade and minimum of 2 inches above paved surfaces, unless otherwise approved by manufacturer.

C. Set units in full bed of mortar with full head joints unless otherwise indicated.
   1. Fill collar joints solid as units are set.
   2. Build concealed flashing into mortar joints as units are set.
   3. Keep head joints in coping and other units with exposed horizontal surfaces open to receive sealant.
   4. Keep joints at shelf angles open to receive sealant.

D. Grout Joints, jointless/dry stacked, refer to manufacturers recommendations

E. Provide sealant joints at copings and other horizontal surfaces, at expansion, control, and pressure-relieving joints, and at locations indicated.
   1. Keep joints free of mortar and other rigid materials.
   2. Prepare and apply sealant of type and at locations indicated to comply with applicable requirements in Division 07 Section "Joint Sealants."

3.2 INSTALLATION TOLERANCES

A. Variation from Plumb: Do not exceed 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.

B. Variation from Level: Do not exceed 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.

C. Variation in Joint Width: Do not vary joint thickness more than 1/8 inch in 36 inches or one-fourth of nominal joint width, whichever is less.

D. Variation in Plane between Adjacent Surfaces (Lipping): Do not vary from flush alignment with adjacent units or adjacent surfaces indicated to be flush with units by more than 1/16 inch, except where variation is due to warpage of units within tolerances specified.

3.3 ADJUSTING AND CLEANING

A. Remove and replace stained and otherwise damaged units and units not matching approved Samples. Cast stone may be repaired if methods and results are approved by Architect.

B. Replace units in a manner that results in cast stone matching approved Samples, complying with other requirements, and showing no evidence of replacement.

C. In-Progress Cleaning: Clean cast stone as work progresses.
   1. Remove mortar fins and smears before tooling joints.
   2. Remove excess sealant immediately, including spills, smears, and spatter.

D. Removing Efflorescence:
   1. Allow veneer to dry thoroughly.
   2. Scrub with soft bristle brush and clean water.
   3. Rinse immediately with clean water; allow to dry.
   4. If efflorescence is still visible, repeat above procedure using a solution of 1 part household vinegar and 5 parts water.
   5. Rinse immediately with clean water.

END OF SECTION 047200

SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Steel framing and supports for ceiling-hung toilet compartments.
2. Miscellaneous steel framing and supports.
3. Loose lintels
4. Shelf angles.
5. Metal ladders.
6. Miscellaneous steel trim.
7. Metal bollards.
8. Pipe guards
9. Loose bearing and leveling plates.
10. Load bearing and leveling plates
11. Balcony pour stop with integral weep
12. Welded wire mesh infill
13. Trash enclosure and gate

B. Refer to Division 05 Section “Metal Formed Fabrications” for metal trim and break metal work.

C. Products furnished, but not installed, under this Section:
1. Loose steel lintels.
2. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.
3. Steel weld plates and angles for casting into concrete.

1.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design ladders, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.
1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

1.3 SUBMITTALS

A. Product Data: For each of the indicated products including the following:
1. Paint products.
2. Grout.
3. Metal ladders

B. Shop Drawings: Show fabrication and installation details for metal fabrications.
1. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

C. Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 QUALITY ASSURANCE

A. Mockups: Build mockups to verify color finishes and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
   1. Build mockups for each form and finish of on custom pieces, indicated on Drawings and Finish Schedule.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces without blemishes.

2.2 FERROUS METALS

A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

B. Stainless-Steel Bars and Shapes: ASTM A 276, Type 304.

C. Rolled-Steel Floor Plate: ASTM A 786/A 786M, rolled from plate complying with ASTM A 36/A 36M or ASTM A 283/A 283M, Grade C or D.

D. Rolled-Stainless-Steel Floor Plate: ASTM A 793.

E. Steel Tubing: ASTM A 500, cold-formed steel tubing.

F. Steel Pipe: ASTM A 53/A 53M, standard weight (Schedule 40) unless otherwise indicated.

2.3 STAINLESS STEEL

A. Tubing: ASTM A 554, Grade MT 304.

B. Castings: ASTM A 743/A 743M, Grade CF 8 or CF 20.

C. Sheet, Strip, Plate, and Flat Bar: ASTM A 666, Type 304.

D. Bars and Shapes: ASTM A 276, Type 304.

2.4 NONFERROUS METALS

A. Aluminum Extrusions: ASTM B 221, Alloy 6063-T6.

B. Aluminum-Alloy Rolled Tread Plate: ASTM B 632/B 632M, Alloy 6061-T6.

C. Aluminum Castings: ASTM B 26/B 26M, Alloy 443.0-F.

D. Bronze Plate, Sheet, Strip, and Bars: ASTM B 36/B 36M, Alloy UNS No. C28000 (muntz metal, 60 percent copper).

2.5 FASTENERS

A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, at exterior walls.
   1. Provide stainless-steel fasteners for fastening aluminum.
   2. Provide stainless-steel fasteners for fastening stainless steel.
   3. Provide stainless-steel fasteners for fastening nickel silver.
   4. Provide bronze fasteners for fastening bronze.

B. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329.

C. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors.
   1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, unless otherwise indicated.
   2. Material for Exterior Locations and Where Stainless Steel is Indicated: Alloy Group 1 Group 2 stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.

D. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563; and, where indicated, flat washers.
   1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.

E. Slotted-Channel Inserts: Cold-formed, hot-dip galvanized-steel box channels (struts) complying with MFMA-4, 1-5/8 by 7/8 inches by length indicated with anchor straps or studs not less than 3 inches long at not more than 8 inches o.c. Provide with temporary filler and tee-head bolts, complete with washers and nuts, all zinc-plated to comply with ASTM B 633, Class Fe/Zn 5, as needed for fastening to inserts.

2.6 MISCELLANEOUS MATERIALS

A. Shop Primers: Provide primers that comply with Division 09 painting Sections.

B. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.

C. Epoxy Zinc-Rich Primer: Compatible with topcoat.

D. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

E. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

F. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

G. Concrete: Comply with requirements in Division 03 Section "Cast-in-Place Concrete" for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength as indicated on Drawings

2.7 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Use connections that maintain structural value of joined pieces.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges. Remove sharp or rough areas on exposed surfaces.

C. Weld corners and seams continuously to comply with the following:
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.
   4. At exposed connections, finish exposed welds and surfaces smooth and blended.

D. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Locate joints where least conspicuous.

E. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

F. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors not less than 24 inches o.c.

2.8 MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.

C. Fabricate steel pipe columns for supporting wood frame construction from steel pipe with steel baseplates and top plates as indicated. Drill or punch baseplates and top plates for anchor and connection bolts and weld to pipe with fillet welds all around. Make welds the same size as pipe wall thickness unless otherwise indicated.

2.9 LOOSE STEEL LINTELS

A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated. Weld adjoining members together to form a single unit where indicated.

B. Size loose lintels to provide bearing length at each side of openings equal to 1/12 of clear span but not less than 8 inches (200 mm), unless otherwise indicated.

C. Galvanize loose steel lintels located in exterior walls.

D. Refer to Drawings for a balance of information.

2.10 SHELF ANGLES

A. Fabricate shelf angles from steel angles of sizes indicated and for attachment to concrete framing.

1. Refer to Drawings for attachment requirements

B. For cavity walls, provide vertical channel brackets to support angles from backup masonry and concrete.

C. Galvanize shelf angles located in exterior walls.

D. Furnish wedge-type concrete inserts, complete with fasteners, to attach shelf angles to cast-in-place concrete.

2.11 MISCELLANEOUS STEEL TRIM

A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.

B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.

C. Galvanize exterior miscellaneous steel trim.

2.12 METAL BOLLARDS

A. Fabricate metal bollards from Schedule 40 steel pipe 1/4-inch wall-thickness rectangular steel tubing.
1. Cap bollards with 1/4-inch- thick steel plate.
2. Finish: Hot dipped galvanized.

B. Fabricate bollards with 3/8-inch- thick steel baseplates for bolting to concrete slab. Drill baseplates at all four corners for 3/4-inch anchor bolts.

C. Fabricate sleeves for bollard anchorage from steel pipe or tubing with 1/4-inch- thick steel plate welded to bottom of sleeve.

2.13 PIPE GUARDS

A. Refer to Drawings for all bollard requirements.

B. Fabricate pipe guards from 3/8-inch- thick by 12-inch- wide steel plate, bent to fit flat against the wall or column at both ends and to fit around pipe with 2-inch clearance between pipe and pipe guard. Drill each end for two 3/4-inch anchor bolts.

C. Galvanize pipe guards.

D. Prime pipe guards with zinc-rich primer.

2.14 LOOSE BEARING AND LEVELING PLATES

A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.

2.15 WELDED WIRE MESH INFILL

A. Welded Wire Mesh,
1. Thickness: 6 gauge steel
2. Finish: Powder Coated, Black

3. Height, refer to Drawings
4. 4 x4 inches

B. Refer to Division 05 Section “Pipe and Tube Railings” for balance of information.

2.16 TRASH ENCLOSURE

A. Fabricate Gates according to Drawings:
1. Corrugated-Profile, Exposed-Fastener Metal Wall Panels: Formed with alternating curved ribs spaced at 2.67 inches o.c. across width of panel,
   a. Basis-of-Design Product: Subject to compliance with requirements, provide S Deck as manufactured by Berridge Manufacturing Company.
      1) Steel decking, 16 gauge ribbed; Alternate
   b. Panel: 7/8 inches Corrugations to be spaced 2-½ inches on center.
   c. Material: Zinc-coated (galvanized) steel sheet, 24 gauge nominal thickness.
      1) Finish: Powder Coated
      2) Color: As selected by Architect from manufacturer's full range

B. Gate Hardware Drawings:
1. Finish: Powder Coated
2. Metal hinge, continuously welded to steel tube.
3. ½ inch Cane bolt with welded stop pin.
4. 5/16 inch diameter pipe sections welded to the cane bolt support.
5. Lock hasp.

C. Steel framing
1. Fasteners, as required to comply with design requirements.

2.17 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish metal fabrications after assembly.

2.18 STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.

B. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.
1. Shop prime with universal shop primer unless zinc-rich primer is indicated.

C. Preparation for Shop Priming: Prepare surfaces to comply with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning.”
1. Exterior Items: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
2. Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
3. Other Items: SSPC-SP 3, "Power Tool Cleaning."

D. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

E. High-Performance Organic Finish: 3-coat fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pre-treat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

F. Custom exposed “raw” steel finishes: Match architects sample, Options include but not limited to, fabricator to provide samples for approval prior to the finishing of steel.
1. Oil Based Coating: Basis of Design, Penetrol
2. Natural Wax (Beeswax and Carnauba was); Briwax
3. Clear Lacquers: Permalac Clearcoat

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Field Welding: Comply with the following requirements:
1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended.

D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction.

E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

3.2 INSTALLING METAL BOLLARDS

A. Fill metal-capped bollards solidly with concrete and allow concrete to cure seven days before installing.

B. Anchor bollards to existing construction with expansion anchors.. Provide four 3/4-inch bolts at each bollard unless otherwise indicated.

C. Anchor bollards in concrete with pipe sleeves preset and anchored into concrete. Fill annular space around bollard solidly with nonshrink, nonmetallic grout.

D. Anchor bollards in place with concrete footings. Place concrete and vibrate or tamp for consolidation. Support and brace bollards in position until concrete has cured.

E. Fill bollards solidly with concrete, mounding top surface to shed water.

3.3 INSTALLING BEARING AND LEVELING PLATES

A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.

B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with grout.

C. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.4 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 055000

SECTION 055213 - PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes pipe and tube railings.

1.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design railings, including comprehensive engineering analysis by a qualified professional engineer, licensed in the State of Colorado, using performance requirements and design criteria indicated.

B. Structural Performance: Railings shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
   1. Handrails and Top Rails of Guards:
      a. Uniform load of 50 lbf/ ft. applied in any direction.
      b. Concentrated load of 200 lbf applied in any direction.
      c. Uniform and concentrated loads need not be assumed to act concurrently.
   2. Infill of Guards:
      a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft..
      b. Infill load and other loads need not be assumed to act concurrently.

C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1.3 SUBMITTALS

A. Product Data: For the following:
   1. Manufacturer's product lines of mechanically connected railings.
   2. Railing brackets.
   3. Grout, anchoring cement, and paint products.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

C. Samples: For each type of exposed finish required.

D. Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer, licensed in the State of Colorado, responsible for their preparation.

E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, according to ASTM E 894 and ASTM E 935.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

A. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.

2.2 STEEL AND IRON

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For components exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Tubing: ASTM A 500 (cold formed) or ASTM A 513.

C. Pipe: ASTM A 53/A 53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.

D. Plates, Shapes, and Bars: ASTM A 36/A 36M.

2.3 MISCELLANEOUS MATERIALS

A. Fasteners: Provide the following:
   1. Ungalvanized-Steel Railings: Plated steel fasteners complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5 for zinc coating.
   2. Hot-Dip Galvanized Railings: Type 304 stainless-steel or hot-dip zinc-coated steel fasteners complying with ASTM A 153/A 153M or ASTM F 2329 for zinc coating.

B. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.

C. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

D. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer compatible with topcoat.

E. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.
   1. Apply bituminous paint to concealed surfaces of cast-metal units set into concrete.

F. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.4 STAIR RAILINGS

A. Steel Tube Railings: Fabricate railings to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of tube, post spacings, and anchorage, but not less than that needed to withstand indicated loads.
   1. Refer to Drawings for Design.

B. Welded Connections: Fabricate railings with welded connections. Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
   1. Finish welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 1 welds: no evidence of a welded joint.

C. Form changes in direction of railings by bending or by inserting prefabricated elbow fittings.

D. Form curves by bending members in jigs to produce uniform curvature without buckling.

E. Close exposed ends of railing members with prefabricated end fittings.

F. Provide wall returns at ends of wall-mounted handrails.

G. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnecting components and for attaching to other work.
   1. Connect posts to stair framing by direct welding.

H. Fillers: Provide fillers made from steel plate, or other suitably crush-resistant material, to transfer wall bracket loads through wall finishes. Size fillers to suit wall finish thicknesses.

2.5 BARRIER GATE

A. Barrier Gates: Manufacturers standard swing gate assembly with steel spring hinges and rubber bumper between space that barrier gate and rail post termination intersect. Fabricated from Hollow Structural Steel (HSS) or pipe stock.

B. Finish: Match railings.

2.6 FABRICATION

A. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

B. Form work true to line and level with accurate angles and surfaces.

C. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove flux immediately.
   4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.

D. Welded Connections for Aluminum Pipe: Fabricate railings to interconnect members with concealed internal welds that eliminate surface grinding, using manufacturer's standard system of sleeve and socket fittings.

E. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.

F. Form changes in direction by bending.

G. Bend members in jigs to produce uniform curvature without buckling or otherwise deforming exposed surfaces.

H. Close exposed ends of railing members with prefabricated end fittings.

I. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated.

J. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.

1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers to transfer loads through wall finishes.

2.7 STEEL AND IRON FINISHES

A. Finish railings after assembly.

B. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."

C. Primer Application: Apply shop primer to prepared surfaces of railings unless otherwise indicated. Comply with requirements in SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

D. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
1. Color: As selected.

E. Finish:
1. Exterior: Powder coat
2. Interior: Refer to Division 09 Section “Interior Painting”

PART 3 - EXECUTION

3.1 INSTALLATION

A. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
1. Do not weld, cut, or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
2. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.

B. Corrosion Protection: Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

C. Anchor posts in concrete by inserting into preset metal pipe sleeves and grouting annular space.

D. Anchor posts to metal surfaces with oval flanges.

E. Anchor railing ends at walls with round flanges anchored to wall construction.

F. Anchor railing ends to metal surfaces with flanges bolted to metal surfaces.

G. Attach railings to wall with wall brackets, except where end flanges are used. Use type of bracket with flange tapped for concealed anchorage to threaded hanger bolt.

H. Secure wall brackets and railing end flanges to building construction as follows:
1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
2. For hollow masonry anchorage, use toggle bolts.

3. For steel-framed partitions, use hanger or lag bolts set into fire-retardant-treated wood backing between studs. Coordinate with stud installation to locate backing members.
4. For steel-framed partitions, use self-tapping screws fastened to steel framing or to concealed steel reinforcements.
5. For steel-framed partitions, use toggle bolts installed through flanges of steel framing or through concealed steel reinforcements.

3.2 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 055213

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Framing with dimension lumber.
   2. Framing with timber.
   3. Framing with engineered wood products.
   4. Rooftop equipment bases and support curbs.
   5. Wood blocking and nailers.

1.2 DEFINITIONS

A. Exposed Framing: Framing not concealed by other construction.

B. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal in least dimension.

C. Timber: Lumber of 5 inches nominal or greater in least dimension.

D. Lumber grading agencies, and the abbreviations used to reference them, include the following:
   1. NeLMA: Northeastern Lumber Manufacturers' Association.
   2. NLGA: National Lumber Grades Authority.
   3. SPIB: The Southern Pine Inspection Bureau.
   4. WCLIB: West Coast Lumber Inspection Bureau.
   5. WWPA: Western Wood Products Association.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
   1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
   2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
   3. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.
   4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
   5. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

B. Fastener Patterns: Full-size templates for fasteners in exposed framing.

1.4 INFORMATIONAL SUBMITTALS

A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

B. Evaluation Reports: For the following, from ICC-ES:
1. Wood-preservative-treated wood.
2. Engineered wood products.
3. Power-driven fasteners.
4. Powder-actuated fasteners.
5. Expansion anchors.
6. Metal framing anchors.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
1. Factory mark each piece of lumber with grade stamp of grading agency.
2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece.
3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
4. Provide dressed lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.

C. Engineered Wood Products: Provide engineered wood products acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.
1. Allowable Design Stresses: Provide engineered wood products with allowable design stresses, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values

shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.
   1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.
   2. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
   1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece.

D. Application: Treat items indicated on Drawings, and the following:
   1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
   2. Wood sills, sleepers, blocking, and similar concealed members in contact with masonry or concrete.
   3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
   4. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 DIMENSION LUMBER FRAMING

A. All Walls and Partitions: No. 1 / No. 2 grade.
   1. Application: Exterior walls and interior walls, both load-bearing and non-load-bearing.
   2. Size: 2x Lumber
      a. Species: Douglas fir-larch; WCLIB or WWPA.

B. Headers, Beams, Joists, Rafters, and Other Framing Not Listed Above: No. 1 grade.
   1. Size: 2x8 and larger.
   2. Species: Douglas fir-larch; WCLIB or WWPA.

2.4 TIMBER FRAMING

A. Provide timber framing complying with the following requirements, according to grading rules of grading agency indicated:
   1. Size: All members wider than 2x material above.
   2. Species and Grade: Southern pine; No. 1 grade; SPIB.
   3. Maximum Moisture Content: 20 percent.
   4. Additional Restriction: Free of heart centers.

2.5 ENGINEERED WOOD PRODUCTS

A. Engineered Wood Products, General: Products shall contain no urea formaldehyde.

B. Source Limitations: Obtain each type of engineered wood product from single source from a single manufacturer.

C. Laminated-Veneer Lumber: Structural composite lumber made from wood veneers with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D 5456 and manufactured with an exterior-type adhesive complying with ASTM D 2559.
   1. Extreme Fiber Stress in Bending, Edgewise: 2600 psi for 12-inch nominal- depth members.
   2. Modulus of Elasticity, Edgewise: 1,800,000 psi.
   3. Basis of Design: Roseburg or approved equal.
   4. Preference shall be given to products/materials that have a product-specific Type III Environmental Product Declaration (EPD).

D. Parallel-Strand Lumber (PSL): Structural composite lumber made from wood strand elements with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D 5456 and manufactured with an exterior-type adhesive complying with ASTM D 2559.
   1. Grade for beams and headers: 2.0E.
   2. Grade for columns and posts: 1.8E.

E. Rim Boards: Product designed to be used as a load-bearing member and to brace wood I-joists at bearing ends, complying with research/evaluation report for I-joists.
   1. Manufacturer: Provide products by same manufacturer as I-joists.
   2. Material: All-veneer product or product made from any combination solid lumber, wood strands, and veneers.
   3. Thickness: As indicated.
   4. Provide performance-rated product complying with APA PRR-401, rim board grade, factory marked with APA trademark indicating thickness, grade, and compliance with APA standard.

2.6 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
   1. Blocking.
   2. Nailers.
   3. Rooftop equipment bases and support curbs.
   4. Cants.

B. For items of dimension lumber size, provide Construction or No. 2 grade lumber and any of the following species:
   1. Hem-fir (north); NLGA.
   2. Mixed southern pine; SPIB.
   3. Spruce-pine-fir; NLGA.
   4. Hem-fir; WCLIB or WWPA.

C. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

2.7 PLYWOOD BACKING PANELS

A. Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.

2.8 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
   1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

B. Nails, Brads, and Staples: ASTM F 1667.

C. Power-Driven Fasteners: NES NER-272.

D. Wood Screws: ASME B18.6.1.

E. Lag Bolts: ASME B18.2.1.

F. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.

G. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry assemblies and equal to four times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
   1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.

2.9 METAL FRAMING ANCHORS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
   1. Simpson Strong-Tie Co., Inc.

C. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those of products of manufacturers listed. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

D. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 coating designation.
   1. Use for interior locations unless otherwise indicated.

E. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A 653/A 653M; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 coating designation; and not less than 0.036 inch thick.
   1. Use for wood-preservative-treated lumber and where indicated.

F. Joist Hangers: U-shaped joist hangers with 2-inch- long seat and 1-1/4-inch- wide nailing flanges at least 85 percent of joist depth.
   1. Thickness: 0.062 inch.

G. Post Bases: Adjustable-socket type for bolting in place with standoff plate to raise post 1 inch above base and with 2-inch- minimum side cover, socket 0.062 inch thick, and standoff and adjustment plates 0.108 inch thick, unless indicated.

H. Hold-Downs: Brackets for bolting to wall studs and securing to foundation walls with anchor bolts or to other hold-downs with threaded rods and designed with first of two bolts placed seven bolt diameters from reinforced base.
   1. See products indicated.

2.10 MISCELLANEOUS MATERIALS

A. Sill-Sealer Gaskets: Glass-fiber-resilient insulation, fabricated in strip form, for use as a sill sealer; 1-inch nominal thickness, compressible to 1/32 inch; selected from manufacturer's standard widths to suit width of sill members indicated.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locatenailers, blocking,and similar supports to comply with requirements for attaching other construction.

B. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

C. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.

D. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant treated plywood backing panels with classification marking of testing agency exposed to view.

E. Metal Framing Anchors: Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

F. Install sill sealer gasket to form continuous seal between sill plates and foundation walls.

G. Do not splice structural members between supports unless otherwise indicated.

H. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
   1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches o.c.

I. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:
   1. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal- thickness.
   2. Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 feet o.c.

J. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

K. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
   1. Use copper naphthenate for items not continuously protected from liquid water.

L. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
   1. NES NER-272 for power-driven fasteners.
   2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.

M. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

N. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.
   1. Comply with indicated fastener patterns where applicable.
   2. Use common nails unless otherwise indicated. Drive nails snug but do not countersink nail heads.

3.2 WOOD BLOCKING, AND NAILER INSTALLATION

A. Install where indicated and where required for screeding or attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

C. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

3.3 WALL AND PARTITION FRAMING INSTALLATION

A. General: Provide single bottom plate and double top plates, unless indicated, using members of 2-inch nominal thickness whose widths equal that of studs. Fasten plates to supporting construction unless otherwise indicated.
   1. For exterior walls, provide 2-by-6-inch nominal- size wood studs spaced 16 inches o.c. unless otherwise indicated.

2. For interior partitions and walls, provide 2-by-4-inch nominal- size wood studs spaced 16 inches o.c. unless otherwise indicated.

B. Construct corners and intersections with three or more studs, except that two studs may be used for interior non-load-bearing partitions.

C. Frame openings with multiple studs and headers. Provide nailed header members of thickness equal to width of studs. Support headers on jamb studs.
   1. For non-load-bearing partitions, provide double-jamb studs and headers not less than 4-inch nominal depth for openings 48 inches and less in width, 6-inch nominal depth for openings 48 to 72 inches in width, 8-inch nominal depth for openings 72 to 120 inches in width, and not less than 10-inch nominal depth for openings 10 to 12 feet in width.
   2. For load-bearing walls, provide double-jamb studs for openings 60 inches and less in width, and triple-jamb studs for wider openings. Provide headers of depth indicated or, if not indicated, according to Table R502.5(1) or Table R502.5(2), as applicable, in ICC's International Residential Code for One- and Two-Family Dwellings.

3.4 TIMBER FRAMING INSTALLATION

A. Install timber with crown edge up and provide not less than 4 inches of bearing on supports. Provide continuous members unless otherwise indicated; tie together over supports as indicated if not continuous.

B. Install wood posts using metal anchors indicated.

C. Treat ends of timber beams and posts exposed to weather by dipping in water-repellent preservative for 15 minutes.

3.5 PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000

SECTION 061600 - SHEATHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Wall sheathing.
   2. Roof sheathing
   3. Sheathing joint and penetration treatment.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1.3 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For following products, from ICC-ES:

1.4 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For assemblies with fire-resistance ratings, provide materials and construction identical to those of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.
   1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory."

2.2 SHEATHING

A. Glass-Mat Gypsum Sheathing: ASTM C 1177/1177M.
   1. Basis of Design Products: Subject to compliance with requirements, provide Dens-Glass Gold as manufactured by G-P Gypsum Corporation or approved equal.
   2. Type and Thickness: 5/8 inches unless indicated otherwise.

2.3 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

B. Screws for Fastening Sheathing to Cold-Formed Metal Framing: Steel drill screws, in length recommended by sheathing manufacturer for thickness of sheathing to be attached, with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B 117.

2.4 SHEATHING JOINT-AND-PENETRATION TREATMENT MATERIALS

A. Sealant for Glass-Mat Gypsum Sheathing: Silicone emulsion sealant complying with ASTM C 834, compatible with sheathing tape and sheathing and recommended by tape and sheathing manufacturers for use with glass-fiber sheathing tape and for covering exposed fasteners.
   1. Sheathing Tape: Self-adhering glass-fiber tape, minimum 2 inches (50 mm) wide, 10 by 10 or 10 by 20 threads/inch (390 by 390 or 390 by 780 threads/m), of type recommended by sheathing and tape manufacturers for use with silicone emulsion sealant in sealing joints in glass-mat gypsum sheathing and with a history of successful in-service use.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.

B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.

C. Securely attach to substrate by fastening as indicated, complying with the following:

D. NES NER-272 for power-driven fasteners.
   1. Table 2304.9.1, "Fastening Schedule," in ICC's "International Building Code."

E. Coordinate wall sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

F. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

G. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

H. Verify that framing members do not vary more than 1/8 inch from plane of faces adjacent to framing.

3.2 GYPSUM SHEATHING INSTALLATION

A. Comply with GA-253, ASTM C 1280 and with manufacturer's written instructions.
   1. Fasten gypsum sheathing to cold-formed metal framing with screws.
   2. Install boards with a 3/8-inch (9.5-mm) gap where non-load-bearing construction abuts structural elements.
   3. Install boards with a 1/4-inch (6.4-mm) gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.

B. Horizontal Installation: Install sheathing with V-grooved edge down and tongue edge up. Interlock tongue with groove to bring long edges in contact with edges of adjacent boards without forcing. Abut ends of boards over centers of studs, and stagger end joints of adjacent boards not less than one stud spacing. Attach boards at perimeter and within field of board to each steel stud.
   1. Space fasteners approximately 8 inches (200 mm) o.c. and set back a minimum of 3/8 inch (9.5 mm) from edges and ends of boards.

C. Vertical Installation: Install board vertical edges centered over studs. Abut ends and edges of each board with those of adjacent boards. Attach boards at perimeter and within field of board to each stud.
   1. Space fasteners approximately 8 inches (200 mm) o.c. and set back a minimum of 3/8 inch (9.5 mm) from edges and ends of boards.
   2. Sheathing panels shall not be less that 7 inches from finish grade in fully weather and water protected siding systems.

D. Seal joints according to manufacturers recommendations.

END OF SECTION 061600

SECTION 061753 - SHOP-FABRICATED WOOD TRUSSES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Wood roof trusses.
   2. Wood floor trusses.
   3. Wood truss bracing.
   4. Metal truss accessories.

1.2 SUBMITTALS

A. Product Data: For metal-plate connectors, metal truss accessories, and fasteners.

B. Shop Drawings: Show fabrication and installation details for trusses.
   1. Show location, pitch, span, camber, configuration, and spacing for each type of truss required.
   2. Indicate sizes, stress grades, and species of lumber.
   3. Indicate locations of permanent bracing required to prevent buckling of individual truss members due to design loads.
   4. Indicate type, size, material, finish, design values, orientation, and location of metal connector plates.
   5. Show splice details and bearing details.

C. Evaluation Reports: For the following, from ICC-ES:
   1. Metal-plate connectors.
   2. Metal truss accessories.

1.3 QUALITY ASSURANCE

A. Metal Connector-Plate Manufacturer Qualifications: A manufacturer that is a member of TPI and that complies with quality-control procedures in TPI 1 for manufacture of connector plates.
   1. Manufacturer's responsibilities include providing professional engineering services needed to assume engineering responsibility.
   2. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.

B. Fabricator Qualifications: Shop that participates in a recognized quality-assurance program that complies with quality-control procedures in TPI 1 and that involves third-party inspection by an independent testing and inspecting agency acceptable to Architect and authorities having jurisdiction and is certified for chain of custody by an FSC-accredited certification body.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Handle and store trusses to comply with recommendations in TPI BCSI, "Building Component Safety Information: Guide to Good Practice for Handling, Installing, Restraining, & Bracing Metal Plate Connected Wood Trusses."

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide metal-plate-connected wood trusses capable of withstanding design loads within limits and under conditions indicated. Comply with requirements in TPI 1 unless more stringent requirements are specified below.

2.2 DIMENSION LUMBER

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
   1. Provide dry lumber with 15 percent maximum moisture content at time of dressing.

B. Permanent Bracing: Provide wood bracing that complies with requirements for miscellaneous lumber in Division 06 Section "Rough Carpentry.

2.3 METAL CONNECTOR PLATES

A. General: Fabricate connector plates to comply with TPI 1.

B. Hot-Dip Galvanized-Steel Sheet: ASTM A 653/A 653M; Structural Steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G60 (Z180) coating designation; and not less than 0.036 inch (0.9 mm) thick.

2.4 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
   1. Provide fasteners for use with metal framing anchors that comply with written recommendations of metal framing manufacturer.
   2. Where trusses are exposed to weather, in ground contact, made from pressure-preservative treated wood, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

B. Nails, Brads, and Staples: ASTM F 1667.

2.5 METAL FRAMING ANCHORS AND ACCESSORIES

A. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

B. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 (Z180) coating designation.

2.6 FABRICATION

A. Assemble truss members in design configuration indicated; use jigs or other means to ensure uniformity and accuracy of assembly with joints closely fitted to comply with tolerances in TPI 1. Position members to produce design camber indicated.
   1. Fabricate wood trusses within manufacturing tolerances in TPI 1.

B. Connect truss members by metal connector plates located and securely embedded simultaneously in both sides of wood members by air or hydraulic press.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install wood trusses only after supporting construction is in place and is braced and secured.

B. If trusses are delivered to Project site in more than one piece, assemble trusses before installing.

C. Hoist trusses in place by lifting equipment suited to sizes and types of trusses required, exercising care not to damage truss members or joints by out-of-plane bending or other causes.

D. Install and brace trusses according to TPI recommendations and as indicated.

E. Anchor trusses securely at bearing points; use metal truss tie-downs or floor truss hangers as applicable. Install fasteners through each fastener hole in metal framing anchors according to manufacturer's fastening schedules and written instructions.

F. Securely connect each truss ply required for forming built-up girder trusses.

G. Install and fasten permanent bracing during truss erection and before construction loads are applied. Anchor ends of permanent bracing where terminating at walls or beams.
   1. Install bracing to comply with Division 06 Section "Rough Carpentry".
   2. Install and fasten strongback bracing vertically against vertical web of parallel-chord floor trusses at centers indicated.

H. Install wood trusses within installation tolerances in TPI 1.

I. Do not alter trusses in field. Do not cut, drill, notch, or remove truss members.

J. Replace wood trusses that are damaged or do not meet requirements.

END OF SECTION 061753

SECTION 061800 - GLUED-LAMINATED CONSTRUCTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes framing using structural glued-laminated timber.

B. Glued-laminated stair treads.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Certificates of Conformance: Issued by a qualified testing and inspecting agency indicating that structural glued-laminated timber complies with requirements in AITC A190.1.

1.3 QUALITY ASSURANCE

A. Manufacturer Qualifications: Provide factory-glued structural units produced by an AITC- or APA-licensed firm.
   1. Factory mark each piece of structural glued-laminated timber with AITC Quality Mark or APA-EWS trademark. Place mark on surfaces that will not be exposed in the completed Work.

B. Quality Standard: Comply with AITC A190.1.

1.4 DELIVERY, STORAGE, AND HANDLING

A. General: Comply with provisions in AITC 111.

B. Individually wrap members using plastic-coated paper covering with water-resistant seams.

PART 2 - PRODUCTS

2.1 STRUCTURAL GLUED-LAMINATED TIMBER

A. General: Provide structural glued-laminated timber that complies with AITC 117 or research/evaluation reports acceptable to authorities having jurisdiction.
   1. Provide structural glued-laminated timber made from solid lumber laminations; do not use laminated veneer lumber.
   2. Provide structural glued-laminated timber made with wet-use adhesive complying with AITC A190.1.
   3. Treatment for Wood: Use category UC3B as defined by The American Wood Preservers Association (AWPA).

B. Species and Grades for Structural Glued-Laminated Timber: Any species that complies with structural properties indicated.

C. Species and Grades for Beams and Purlins:
   1. Species and Beam Stress Classification: Per Drawings
   2. Lay-up: Balanced.

D. Species and Grades for Columns, Truss Members, and Stair Treads:
   1. Species and Combination Symbol: Per Drawings

E. Appearance Grade: Architectural, complying with AITC 110.

F. End Sealer: Manufacturer's standard, transparent, colorless wood sealer that is effective in retarding the transmission of moisture at cross-grain cuts and is compatible with indicated finish.

G. Penetrating Sealer: Manufacturer's standard, transparent, penetrating wood sealer that is compatible with indicated finish.

H. Coating: High gloss, cleanable at all exposed areas. Anti-slip coating at stair treads.

2.2 TIMBER CONNECTORS

A. General: Unless otherwise indicated, fabricate from the following materials:
   1. Structural-steel shapes, plates, and flat bars complying with ASTM A 36/A 36M.
   2. Round steel bars complying with ASTM A 575, Grade M 1020.
   3. Hot-rolled steel sheet complying with ASTM A 1011/A 1011M, Structural Steel, Type SS, Grade 33.

B. Finish steel assemblies and fasteners with rust-inhibitive primer, 2-mil dry film thickness.

C. Hot-dip galvanize steel assemblies and fasteners after fabrication to comply with ASTM A 123/A 123M or ASTM A 153/A 153M.

2.3 FABRICATION

A. Shop fabricate for connections to greatest extent possible, including cutting to length and drilling bolt holes.

B. Camber: Fabricate horizontal and inclined members of less than 1:1 slope with either circular or parabolic camber equal to 1/500 of span.

C. End-Cut Sealing: Immediately after end cutting each member to final length, apply a saturation coat of end sealer to ends and other cross-cut surfaces, keeping surfaces flood coated for not less than 10 minutes.

D. Seal Coat: After fabricating, sanding, and end-coat sealing, apply a heavy saturation coat of penetrating sealer on surfaces of each unit.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Erect structural glued-laminated timber true and plumb, and with uniform, close-fitting joints. Provide temporary bracing to maintain lines and levels until permanent supporting members are in place.

1. Lift with padded slings and protect corners with wood blocking.

B. Fit structural glued-laminated timber by cutting and restoring exposed surfaces to match specified surfacing.
   1. Predrill for fasteners using timber connectors as templates.
   2. Dress exposed surfaces as needed to remove planing and surfacing marks.
   3. Coat cross cuts with end sealer.

C. Cutting: Avoid cutting after fabrication. Where field fitting is unavoidable, comply with requirements for shop fabrication.

D. Repair damaged surfaces after completing erection. Replace damaged structural glued-laminated timber if repairs are not approved by Architect.

E. Do not remove wrappings on individually wrapped members until they no longer serve a useful purpose including protection from weather, sunlight, soiling, and damage from work of other trades.
   1. Slit underside of wrapping to prevent accumulation of moisture inside the wrapping.

END OF SECTION 061800

SECTION 064013 - EXTERIOR ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes exterior composite decking work.

1.2 SUBMITTALS

A. Product Data: For materials and finishes indicated.

B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

C. Samples for Verification: For each color specified.

PART 2 - PRODUCTS

2.1 COMPOSITE DECKING

A. Composite Lumber: Solid shapes made from a mixture of cellulose fiber and polyethylene.
   1. Product: Trex Company, Inc. (Basis of Design).
   2. Texture: Smooth
   3. Color: As selected.
   4. Sizes: 1x6 inches

B. Accessories: Fasteners: Composite wood screws, or stainless steel screws of the appropriate length as recommended by the composite wood manufacturer for the specific profile being fastened.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Before installation, condition woodwork to average prevailing humidity conditions in installation areas. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including removal of packing.

B. Pre-drill fastener holes located closer than 1 inch from edges.

C. Install woodwork true and straight with no distortions. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches.

D. Leave expansion spaces between abutting boards and between boards and adjacent construction:
   1. End gaps between boards: ⅛ inch.

2. Side gaps between boards: ¼ inch
3. Gaps between boards and adjacent construction: ¼ inch

E. Complete finishing work specified in this Section to extent not completed at shop or before installation of woodwork. Fill nail and screw holes with matching filler where exposed.

F. Clean woodwork on exposed and semiexposed surfaces according to manufacturers recommendations.

END OF SECTION 064013

SECTION 064023 - INTERIOR ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Shelving and clothes rods
   2. Molded veneer trim
   3. Wood cabinets.
   4. Shop finishing of woodwork.

B. Related Sections
   1. Refer to Division 12 Section “Residential Casework” for prefabricated cabinets.

C. Interior architectural woodwork includes wood furring, blocking, shims, and hanging strips unless concealed within other construction before woodwork installation.

1.2 SUBMITTALS

A. Product Data: For solid-surfacing material, cabinet hardware and accessories and finishing materials and processes.

B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

C. Samples:
   1. Lumber and panel products for transparent finish, for each species and cut, finished on one side and one edge.
   2. Lumber and panel products with shop-applied opaque finish, for each finish system and color, with exposed surface finished.
   3. Plastic-laminates, for each type, color, pattern, and surface finish.
   4. Thermoset decorative panels, for each type, color, pattern, and surface finish.

D. Woodwork Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: Fabricator of woodwork.

B. Quality Standard: Unless otherwise indicated, comply with AWI's "Architectural Woodwork Quality Standards.”
   1. Provide AWI Quality Certification Program labels and certificates for woodwork, including installation.

1.4 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Wood Products:
   1. Hardboard: AHA A135.4.
   2. Medium-Density Fiberboard: ANSI A208.2, Grade MD.
      a. Premium MDF; Class C fire rating.
   3. Particleboard: ANSI A208.1, Grade M-2
   4. Softwood Plywood: DOC PS 1, Medium Density Overlay.
   5. Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1.

B. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or, if not indicated, as required by woodwork quality standard.

C. Grade: Premium

D. Trim Profiles: As indicated on Drawings.

E. Trim Species for Transparent Finish: Walnut.

F. Trim for Opaque Finish: MDF.

G. Laminate Cladding for Exposed Surfaces:
   1. Horizontal Surfaces: Grade HGS.
   2. Postformed Surfaces: Grade HGP.
   3. Vertical Surfaces: Grade HGS.
   4. Edges: As indicated.
   5. Pattern Direction: As indicated

2.2 FIRE-RETARDANT-TREATED MATERIALS

A. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Comply with performance requirements of AWPA C20 (lumber) and AWPA C27 (plywood). Use Exterior Type or Interior Type A. Use fire-retardant-treatment formulations that do not bleed through or otherwise adversely affect finishes. Kiln-dry material after treatment.

B. Fire-Retardant Particleboard: Panels made from softwood particles and fire-retardant chemicals mixed together at time of panel manufacture with flame-spread index of 25 or less and smoke-developed index of 25 or less per ASTM E 84.

C. Fire-Retardant Fiberboard: ANSI A208.2 medium-density fiberboard panels made from softwood fibers, synthetic resins, and fire-retardant chemicals mixed together at time of panel manufacture with flame-spread index of 25 or less and smoke-developed index of 200 or less per ASTM E 84.

2.3 SHELVING AND CLOTHES RODS

A. Shelving:
   1. Wire Shelving: Epoxy covered wire shelving.
      a. Manufacturer: Newell Rubbermaid Inc, or approved equal.
      b. Size: As indicated.
   2. Shelf Brackets with Rod Support: BHMA A156.16, B04051; prime-painted formed steel.
   3. Clothes Rods: 1-1/2-inch- diameter, aluminum tube.

B. Shelf Brackets with Rod Support: BHMA A156.16, B04051; prime-painted formed steel.

2.4 MOLDED VENEER TRIM

A. Engineered polyethylene terephthalate resin solid color modular wall cover and trim molded to particle board core:
1. Basis of Design: Acrovyn 4000 Saratoga as manufactured by Construction Specialties Inc.
2. Thickness: 0.04 inches
3. Finish: Simulated woodgrain
4. Core: Particle board, containing no-urea formaldehyde
   a. Thickness: 3/8 inches
5. Color: Vintage Walnut 383.
6. Edges: Square
7. Sheets: As indicated on Drawings.
8. Trim and Moldings: As indicated on Drawings.

B. CROWN MOULDING
1. Basis of Design: Subject to project requirements, provide MLD521-8 by Fypon LLC.
2. Material: Polyurethane.
3. Texture: Smooth.
4. Height: 13 1/8”.
5. Bottom thickness: 1 inch.
6. Projection: 5 inches.

2.5 CABINET HARDWARE AND ACCESSORIES

A. General: Provide cabinet hardware and accessory materials associated with architectural woodwork; except for items specified in Division 08 Section "Door Hardware (Scheduled by Describing Products)."
1. Refer to Finish Legend for additional product information.

B. Butt Hinges: 2-3/4-inch, 5-knuckle steel hinges made from 0.095-inch- thick metal, and as follows:
1. Semiconcealed Hinges for Flush Doors: BHMA A156.9, B01361.
2. Semiconcealed Hinges for Overlay Doors: BHMA A156.9, B01521.

C. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, 100 135 170 degrees of opening, self-closing (For Cabinet Doors).

D. Back-Mounted Pulls: BHMA A156.9, B02011.

E. Pulls: Tab door and drawer pulls:
1. Basis of Design: Elements by Hardware Resources Inc.
2. Finish: Refer to schedule

F. Catches: Push-in magnetic catches, BHMA A156.9.
1. Basis of Design: Elements by Hardware Resources Inc.
2. Finish: Refer to schedule

G. Drawer Slides: BHMA A156.9, B05091.
1. Standard Duty (Grade 1, Grade 2, and Grade 3): Side mounted full -extension partial-extension type; epoxy-coated steel with polymer rollers.
2. Heavy Duty (Grade 1HD-100 and Grade 1HD-200): Side mounted; full-extension type; zinc-plated steel ball-bearing slides.
3. Box Drawer Slides: Grade 1HD-100; for drawers not more than 6 inches high and 24 inches wide.
4. File Drawer Slides: Grade 1HD-200; for drawers more than 6 inches high or 24 inches wide.

5. Pencil Drawer Slides: Grade 1; for drawers not more than 3 inches high and 24 inches wide.

H. Aluminum Slides for Sliding Glass Doors: BHMA A156.9, B07063.

I. Door Locks: BHMA A156.11, E07121.

J. Drawer Locks: BHMA A156.11, E07041.

K. Grommets at Recycling Centers.

L. Concealed Horizontal Countertop Support Brackets

M. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.

2.6 MISCELLANEOUS MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, fire-retardant-treated, kiln-dried to less than 15 percent moisture content.

2.7 FABRICATION

A. General: Complete fabrication to maximum extent possible before shipment to Project site. Where necessary for fitting at site, provide allowance for scribing, trimming, and fitting.
   1. Interior Woodwork Grade:
      a. Premium: All exposed wood.
      b. Custom: Plastic laminate casework and, shelving.
   2. Shop cut openings to maximum extent possible. Sand edges of cutouts to remove splinters and burrs. Seal edges of openings in countertops with a coat of varnish.

B. Routing: Route out numbers at unit doors as indicated.
   1. Finish routed out sides and back to match architects sample.

C. Fire-Rated Interior Frames and Jambs: Products fabricated from fire-retardant particleboard or fire-retardant medium-density fiberboard with veneered, exposed surfaces and listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252.
   1. Fire Rating: 20 minutes.

D. Wood Cabinets for Transparent Finish:
   1. AWI Type of Cabinet Construction: Flush overlay.
   2. Reveal Dimension: 1/2 inch
   3. Grain Direction: Vertically for drawer fronts, doors, and fixed panels.
   4. Matching of Veneer Leaves: Book match.
   5. Semiexposed Surfaces Other Than Drawer Bodies: Compatible species to that indicated for exposed surfaces, stained to match.
   6. Drawer Sides and Backs: Thermoset decorative panels.
   7. Drawer Bottoms: Hardwood plywood.

2.8 FINISHING

A. Finish architectural woodwork at fabrication shop to the extent possible.
   1. Defer only final touchup, cleaning, and polishing until after installation.

B. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of woodwork. Apply two coats to back of paneling.

C. Transparent Finish:
1. Grade: Premium.
2. AWI Finish System: TR-6 Conversion varnish.
3. Staining: Match architects sample.
4. Wash Coat for Stained Finish: Apply a wash-coat sealer to woodwork made from closed-grain wood before staining and finishing.
5. Open-Grain Woods: After staining (if any), apply paste wood filler to open-grain woods and wipe off excess. Tint filler to match stained wood.
6. Sheen: Satin, 31-45 gloss units measured on 60-degree gloss meter per ASTM D 523.

D. Opaque Finish:
1. Grade: Custom.
2. AWI Finish System: Conversion varnish.
3. Color: As indicated on the Finish Legend.
4. Sheen: Satin, 31-45 gloss units measured on 60-degree gloss meter per ASTM D 523.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Before installation, condition woodwork to average prevailing humidity conditions in installation areas. Examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

B. Grade: Install woodwork to comply with requirements for the same grade specified in Part 2 for fabrication of type of woodwork involved.

C. Install woodwork level, plumb, true, and straight to a tolerance of 1/8 inch in 96 inches. Shim as required with concealed shims.

D. Scribe and cut woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

E. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated.

F. Paneling: Anchor paneling to supporting substrate with concealed panel-hanger clips. Do not use face fastening, unless otherwise indicated.
1. Install fire blocking where indicated.

G. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation.
1. Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 inches o.c. with No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish toggle bolts through metal backing or metal framing behind wall finish.

H. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop. Calk space between backsplash and wall with sealant specified in Division 07 Section "Joint Sealants."

3.2 INSTALLTION OF MOLDED VENEER TRIM

A. Install the work of this section in strict accordance with the manufacturer's recommendations, using approved adhesive.

B. Temperature at the time of installation must be between 65-75ºF (18-24ºC) and be maintained for at least 48 hours after the installation to allow for proper adhesive set up.

C. Relative humidity shall not exceed 80 percent. Do not expose wall covering to direct sunlight during or after installation. This will cause the surface temperature to rise, which in turn will cause bubbles and delamination

3.3 CLEANING

A. General: Immediately upon completion of installation, clean wall covering and accessories in accordance with manufacturer's recommended cleaning method.

B. Remove surplus materials, rubbish and debris resulting from installation as work progresses and upon completion of work.

3.4 PROTECTION

A. Protect installed materials to prevent damage by other trades. Use materials that may be easily removed without leaving residue or permanent stains.

END OF SECTION 064023

SECTION 064300 - WOOD STAIRS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes wood stairs.

1.2 ACTION SUBMITTALS

A. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

B. Samples.

1.3 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install wood stairs until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

PART 2 - PRODUCTS

2.1 WOOD STAIRS AND RAILINGS GENERAL

A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of interior architectural woodwork indicated for construction, finishes, installation, and other requirements.

B. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.

C. Composite Wood Products: Products shall be made without urea formaldehyde.

2.2 WOOD STAIRS FOR TRANSPARENT FINISH

A. Finishes for Stair Species and Design: Refer to Drawings.

B. Grade: Premium.

C. Finishes for Stair Parts: Refer to Division 09 Section “Interior Painting”.

2.3 WOOD STAIRS FOR RESILIENT FINISH

A. Grade: Premium.

B. Plywood Treads and Risers, Refer to Division 06 Section “Rough Carpentry”.

C. Refer to Division 09 Section “Resilient Base and Accessories” for stair finish.

2.4 WOOD MATERIALS

A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.
   1. Wood Moisture Content: 8 to 13 percent.

B. Furring, Blocking, Shims, and Hanging Strips: Fire-retardant-treated softwood lumber, kiln dried to less than 15 percent moisture content.
   1. Fiberglass-Reinforced Magnesium Oxide Cement Bonded over LP OSB Panel, Class A, per IBC 2303.2
      a. Basis of Design: FlameBlock as manufactured Louisiana-Pacific Corporation.

C. Carriages for Stairs: Laminated veneer lumber, made with an exterior-type adhesive complying with ASTM D 2559, and with the following allowable design values as determined according to ASTM D 5456:
   1. Extreme Fiber Stress in Bending, Edgewise: 2900 psi for 12-inch nominal- depth members.
   2. Modulus of Elasticity, Edgewise: 1,800,000 psi.

D. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.

2.5 FABRICATION

A. Fabricate wood stairs to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
   1. Corners of Solid-Wood (Lumber) Members: 1/16 inch unless otherwise indicated.

B. Treads and Riser: Fabricate from plywood, OSB will not be accepted.

C. Cut carriages to accurately fit treads and risers. Glue treads to risers, and glue and nail treads and risers to carriages.
   1. Fabricate stairs with treads and risers no more than 1/8 inch from indicated position and no more than 1/16 inch out of relative position for adjacent treads and risers.

PART 3 - EXECUTION

3.1 PREPARATION

A. Before installation, condition wood stairs to average prevailing humidity conditions in installation areas.

3.2 INSTALLATION

A. Stairs: Securely anchor carriages to supporting substrates. Install stairs with treads and risers no more than 1/8 inch from indicated position.

B. Touch up finishing work specified in this Section after installation of wood stairs. Fill nail holes with matching filler where exposed.

C. Fire blocking per Code standards and Drawings

END OF SECTION 064300

SECTION 071113 - BITUMINOUS DAMPPROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes cold-applied, emulsified-asphalt dampproofing.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

1.3 PROJECT CONDITIONS

A. Ventilation: Provide adequate ventilation during application of dampproofing in enclosed spaces. Maintain ventilation until dampproofing has cured.

PART 2 - PRODUCTS

2.1 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

A. Fibered Brush and Spray Coats: ASTM D 1227, Type II, Class 1.

B. Brush and Spray Coats: ASTM D 1227, Type III, Class 1.

2.2 PROTECTION COURSE

A. Protection Course, Asphalt-Board Type: ASTM D 6506, premolded, 1/8-inch- thick, multi-ply, semirigid board consisting of a mineral-stabilized asphalt core sandwiched between layers of asphalt-saturated felt, and faced on 1 side with polyethylene film.

2.3 MISCELLANEOUS MATERIALS

A. General: Furnish auxiliary materials recommended in writing by damproofing manufacturer for intended use and compatible with bituminous damproofing.

B. Emulsified-Asphalt Primer: ASTM D 1227, Type III, Class 1, except diluted with water as recommended by manufacturer.

C. Rigid Insulation: Refer to Division 07 Section “Thermal Insulation”.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean substrates of projections and substances detrimental to work; fill voids, seal joints, and apply bond breakers if any, as recommended by prime material manufacturer.

3.2 APPLICATION, GENERAL

A. Comply with manufacturer's written recommendations unless more stringent requirements are indicated or required by Project conditions to ensure satisfactory performance of dampproofing.

B. Apply dampproofing to footings and foundation walls where opposite side of wall faces building interior, elevator pit walls and exterior retaining wall where indicated.
   1. Apply from finished-grade line to top of footing, extend over top of footing, and down a minimum of 6 inches over outside face of footing.
   2. Extend 12 inches onto intersecting walls and footings, but do not extend onto surfaces exposed to view when Project is completed.
   3. Install flashings and corner protection stripping at internal and external corners, changes in plane, construction joints, cracks, and where shown as "reinforced," by embedding an 8-inch- wide strip of asphalt-coated glass fabric in a heavy coat of dampproofing. Dampproofing coat for embedding fabric is in addition to other coats required.

C. Apply dampproofing to provide continuous plane of protection on exterior face of inner wythe of exterior masonry cavity walls.

D. Apply dampproofing to provide continuous plane of protection on interior face of above-grade, exterior single-wythe masonry walls unless walls are indicated to receive direct application of paint.

3.3 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

A. On Concrete Foundations: Apply 2 brush or spray coats at not less than 1.5 gal./100 sq. ft. for first coat and 1 gal./100 sq. ft. for second coat, 1 fibered brush or spray coat at not less than 3 gal./100 sq. ft., or 1 trowel coat at not less than 4 gal./100 sq. ft..

B. On Unparged Masonry Foundation Walls: Apply primer and 1 trowel coat at not less than 5 gal./100 sq. ft..

C. On Unexposed Face of Concrete Retaining Walls: Apply 1 brush or spray coat at not less than 1.25 gal./100 sq. ft..

D. On Unexposed Face of Masonry Retaining Walls: Apply primer and 1 brush or spray coat at not less than 1.25 gal./100 sq. ft..

E. On Interior Face of Exterior Concrete Walls: Where above grade and indicated to be furred and finished, apply 1 brush or spray coat at not less than 1 gal./100 sq. ft..

3.4 INSTALLATION OF PROTECTION COURSE

A. Where indicated, install protection course over completed-and-cured dampproofing. Comply with dampproofing material manufacturer's written recommendations for attaching protection course.
   1. Support protection course with spot application of adhesive of type recommended by protection board manufacturer over cured coating.
   2. Install protection course within 24 hours of installation of dampproofing (while coating is tacky) to ensure adhesion.

END OF SECTION 071113

SECTION 071900 - WATER REPELLENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes penetrating water-repellent treatments for the following surfaces
   1. Concrete

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples: For each type of water repellent and substrate indicated.

C. Product certificates.

1.3 QUALITY ASSURANCE

A. Preinstallation Conference: Conduct conference at Project site.

1.4 WARRANTY

A. Provide manufacturers special warranty, 5 years from Substantial Completion, to cover workmanship, labor and materials

PART 2 - PRODUCTS

2.1 PENETRATING GRAFFITTI CONTROL AND WATER REPELLENTS

A. Silane/Siloxane-Blend, Penetrating Graffiti Control and Water Repellent: Clear, silane and siloxane blend.
   1. Basis-of-Design: Subject to compliance with requirements, provide ProSoCo; Sure Klean Weather Seal Blok Guard and Graffiti Control II, or comparable product by one of the following:
      a. Diedrich Technologies, Inc.
      b. Euclid Chemical Company (The), an RPM company.
      c. BASF Construction Chemicals, LLC

B. Locations:
   1. As indicated on Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements and conditions affecting performance of the Work.
   1. Verify that surfaces are clean and dry according to water-repellent manufacturer's requirements. Check moisture content in representative locations by method recommended by manufacturer.
   2. Inspect for previously applied treatments that may inhibit penetration or performance of water repellents.
   3. Verify that there is no efflorescence or other removable residues that would be trapped beneath the application of water repellent.
   4. Verify that required repairs are complete, cured, and dry before applying water repellent.

5. Verify compatibility of water repellent with surface.

B. Test pH level according to water-repellent manufacturer's written instructions to ensure chemical bond to silica-containing or siliceous minerals.

3.2 PREPARATION

A. Cleaning: Before application of water repellent, clean substrate of substances that could impair penetration or performance of product according to water-repellent manufacturer's written instructions.

B. Coordination with Mortar Joints: Do not apply water repellent until pointing mortar for joints adjacent to surfaces receiving water-repellent treatment has been installed and cured.

C. Coordination with Sealant Joints: Do not apply water repellent until sealants for joints adjacent to surfaces receiving water-repellent treatment have been installed and cured.
1. Water-repellent work may precede sealant application only if sealant adhesion and compatibility have been tested and verified using substrate, water repellent, and sealant materials identical to those required.

3.3 APPLICATION

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect the substrate before application of water repellent and to instruct Applicator on the product and application method to be used.

B. Apply a heavy-saturation coating of water repellent, on surfaces indicated for treatment, using low-pressure spray to the point of saturation. Remove excess material; do not allow material to puddle beyond saturation. Comply with manufacturer's written instructions for application procedure unless otherwise indicated.
1. Height: 10 ft from grade.

C. Apply a second saturation coating, repeating first application. Comply with manufacturer's written instructions for limitations on drying time between coats and after rainstorm wetting of surfaces between coats. Consult manufacturer's technical representative if written instructions are not applicable to Project conditions.

3.4 CLEANING

A. Immediately clean water repellent from adjoining surfaces and surfaces soiled or damaged by water-repellent application as work progresses. Correct damage to work of other trades caused by water-repellent application.

B. Comply with manufacturer's written cleaning instructions.

END OF SECTION 071900

SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Foam plastic board insulation.
2. Loose-fill insulation
3. Glass-fiber blanket insulation.
4. Fiber Board Insulation.
5. Slag wool blanket insulation
6. Slag wool ceiling panels
7. Perimeter fire containment

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Product test reports.

C. Research/evaluation reports.

D. Delegated-Design Submittal: For clips and hangers used to hold in slag-wool insulation, comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.3 PERFORMANCE REQUIREMENTS

A. All insulation shall comply with IECC 2015/ASHRAE 90.1, Table C402 1.3
1. Rigid Insulation minimum R-5.
2. Blown-in insulation at walls shall be minimum of R-23.
3. Batt insulation at floor exposed to the exterior shall be a minimum of R-30.
4. Insulation at Roof, Closed Cell Spray, 6 inches + R-11 Batt Insulation.
5. Under slab Closed Cell Insulation shall be minimum of R-17.

PART 2 - PRODUCTS

2.1 FOAM-PLASTIC BOARD INSULATION

A. Extruded-Polystyrene Board Insulation (XPS): ASTM C 578, with maximum flame-spread and smoke-developed indexes of 25 and 450, respectively, per ASTM E 84.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
a. DiversiFoam Products.
b. Dow Chemical Company (The).
c. Owens Corning.
d. Pactiv Building Products.

2.2 BLOWN-IN FIBERGLASS INSULATION

A. Loose Fiber Glass Insulation for Closed Cavity Applications. Fiber glass blowing insulation for use behind OPTIMA non-woven fabric in sidewalls, and other closed cavity applications as shown in the drawings. Complies with ASTM C 764; mineral fiber loose fill insulation Type 1:
   1. Fire Hazard Classification: ASTM E 84:
      a. Maximum Flame Spread Index; 5.
      b. Maximum Smoke Developed Index; 5

B. Thickness/Depth: Full depth of cavity and of a density to achieve minimum R-value indicated.

2.3 GLASS-FIBER BLANKET INSULATION

A. Basis of Design: Provide products as manufactured by Owens Corning, or approved equal.

B. Foil-Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type III (reflective faced), Class B (faced surface with a flame-propagation resistance of 0.12 W/sq. cm); Category 1 (membrane is a vapor barrier), faced with foil scrim, foil-scrim kraft, or foil-scrim polyethylene.

C. Glass-Fiber Blanket, Kraft Faced: ASTM C 665, Type II (nonreflective faced), Class C (faced surface not rated for flame propagation); Category 1 (membrane is a vapor barrier).

2.4 FIBER BOARD INSULATION

A. Products
   1. Subject to project requirements, provide Comfortboard 80 by Rockwool.
      a. Size: 24 x 48 inches
      b. Thickness: 1 ¼ inches
   2. Accessories
      a. Metal fasteners in accordance with insulation manufacturer's written recommendations.

B. Description
   1. Non-combustible, rigid. Water repellent, mineral wool insulation board for exterior non-structural commercial and industrial high performance insulation sheathing applications to ASTM C612, Type IVB.

C. Performance Criteria
   A. Board insulation for exterior curtain wall systems: To ASTM C612, Type IVB.
      1. Fire performance:
         a. Surface Burning Characteristics: To ASTM E84.
            1) Flame spread: 0.
            2) Smoke developed: 0.
      2. Thermal resistance (R value/inch at 75 º F: [4.0] hr ft^2 F/Btu to ASTM C518.
      3. Moisture resistance:
         a. Moisture sorption: 0.28 % maximum to ASTM C1104/C1104M.
         b. Water vapour transmission: 35 perm to ASTM E96, Desiccant Method.
         c. Water absorption: 1.2 % to ASTM C209.
      4. Dimensional stability: 0.38 % maximum linear shrinkage at 1200 ºF to ASTM C356.
      5. Corrosive resistance:
         a. Steel to ASTM C665: Non-corrosive.
         b. Stainless steel to ASTM C795: Non-corrosive.
      6. Density: 11.0 lb/ft^3 to ASTM C303.
      7. Compressive strength: To ASTM C165.

a. 584 psf at 10 %.
b. 1566 psf at 25 %.

8. Recycled content: [16] [40] % minimum.
9. Fungi resistance: To ASTM C1338.
10. Acoustical performance sound absorption co-efficients to ASTM C423.

Sound Absorption Coefficiences at Frequencies

Thickness (inches)	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	NRC
1	0.13	0.49	0.85	0.89	0.89	0.97	0.80
2	0.50	0.71	0.85	0.90	0.96	1.01	0.85

2.5 SLAG-WOOL BLANKET INSULATION

A. Preference shall be given to products/materials that have a product-specific Type III Environmental Product Declaration (EPD).

B. Preference shall be given to products that have a Health Product Declaration (HPD)

C. Unfaced, Rock/Slag Wool Blanket Insulation: ASTM C 665, Type 1, consisting of fibers and the by-product of steel production, with maximum flame-spread and smoke-developed indexes of 0 and 0, respectively, per ASTM E 84.
1. EPA Choice Fiber: 75 percent recycled content.
2. Basis of Design: Roxul CavityRock MD
3. Thickness: As required to achieve R Value indicated.

D. Accessories: As required, including hangers and furring.
1. Impaling pins; manufacturers standard

2.6 SPRAY POLYURETHANE FOAM INSULATION

A. Closed-Cell Polyurethane Foam Insulation: ASTM C 1029, Type II, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.
1. Basis of Design: BASF Walltite Insulating Air Barrier.-Sealtite PRO as manufactured by Carlise
2. Thickness: 6 inches minimum
3. Physical Characteristics:
   a. Standards Compliance:
      1) Acceptance Criteria: ICC-ES AC377, Appendix X, for use without prescribed ignition barrier and without need for additional fire-resistant coating.
      2) Evaluation Report: IAPMO UES-621.
   b. Core Density: 2 lbs/ft3 minimum, when tested in accordance with ASTM D 1622.
   c. Compressive Strength: 25 psi when tested in accordance with ASTM D 1621.
   d. R-Value (aged): When tested in accordance with ASTM C 518:
      1) 6.9 at 1 inch.
      2) 24 at 3.5 inches.
      3) 38 at 5.5 inches.
      4) 54 at 7.9 inches.
   e. Closed Cell Content: Greater than 90 percent when tested in accordance with ASTM D 2856.
   f. Surface Burning Characteristics: Less than 25 flame spread index when tested in accordance with ASTM E 84 and Smoke Detection Index less than 450, Flame Spread Index less than 25 when tested in ASTM E 84.

g. Tensile Strength: 60 psi when tested in accordance with ASTM D 1623.
h. Moisture Vapor Transmission (permeance) when tested in accordance with ASTM E 96.
   1) 0.80 Perms at 1 inch.
   2) 0.23 Perms at 3.5 inches.
   3) 0.16 Perms at 5 inches.
   4) 0.10 Perms at 7.9 inches.
i. Water Absorption, ASTM D2842: Less than 2 percent.
j. Dimensional Stability: (7 days at 158 degrees F, 95 percent RH) less than 10 percent change in volume when tested in accordance with ASTM D 2126
k. Air Leakage Rate: Less than 0.004 cfm sqft when tested in accordance with ASTM E 2178.
l. Fungi Resistance: Zero Rating when tested in accordance with ASTM G 21.

4. Provide ignition barrier where required.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and applications indicated.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

C. Extend insulation to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

D. Provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

3.2 INSTALLATION OF INSULATION FOR FRAMED CONSTRUCTION

A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with mechanical anchorage to provide permanent placement and support of units.

B. Glass-Fiber Insulation: Install in cavities formed by framing members according to the following requirements:
   1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
   2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
   3. Maintain 3-inch clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
   4. Install eave ventilation troughs between roof framing members in insulated attic spaces at vented eaves.
   5. For metal-framed wall cavities where cavity heights exceed 96 inches, support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.

C. Continuous Insulation: Install to framing according to manufacturers recommendations.
   1. Mechanically attach insulation with pins, space as required for securing to framing, locate pins maximum of 2 inches away from the edge of insulation.
   2. Seal all penetrations and joints as recommended by manufacturer.

D. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
   1. Loose-Fill Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft..
   2. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

3.3 INSTALLATION OF INSULATION FOR CONCRETE SUBSTRATES

A. Install board insulation on concrete substrates by mechanically attached, spindle-type insulation anchors as follows:
   1. Fasten insulation anchors to concrete substrates according to anchor manufacturer's written instructions. Space anchors according to insulation manufacturer's written instructions for insulation type, thickness, and application indicated.
   2. Apply insulation standoffs to each spindle to create cavity width indicated between concrete substrate and insulation.
   3. Install board insulation by pressing insulation into position over spindles and securing it tightly in place with insulation-retaining washers, taking care not to compress insulation below indicated thickness.
   4. Where insulation will not be covered by other building materials, apply capped washers to tips of spindles.

END OF SECTION 072100

SECTION 072726 – FLUID APPLIED AIR BARRIER

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes Fluid applied air barrier

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For water-resistive barrier and flexible flashing, from ICC-ES.

PART 2 - PRODUCTS

2.1 FLUID APPLIED AIR BARRIER

A. Basis of Design: Dow Defendair 200.

B. Sheathing Joint Material: Parex USA 396 Sheathing Tape: Non-woven synthetic fiber tape to reinforce the membrane at sheathing board joints, into rough openings and other terminations into dissimilar materials.

C. Flashing Membrane: Self sealing, polyester faced, rubberized asphalt membrane, 30 mils (0.76 mm) thick.

2.2 PERFORMANCE REQUIREMENTS:

A. Durability, resistance to aging, water and water penetration resistance, structural loading: joint treatment and primary air barrier material, comply with ICC ES AC 212

B. Flexibility: ASTM D 522, primary air barrier material, no cracking or delamination before and after aging using 1/8 inch (3 mm) mandrel at 14º F (10º C)

C. Nail sealability: ASTM D 1970, 7.9.1, primary air barrier passes

D. Resistance to mold: ASTM D 3273, no mold growth after 28 day exposure

E. Adhesion: joint treatment and primary air barrier material, ASTM C 297 or D 4541, $\geq$ 30 psi (207 kPa), or exceeds strength of glass mat facing on glass mat gypsum substrates

F. Surface burning: ASTM E 84, joint treatment and primary air barrier material flame spread $\leq$ 25, smoke developed $\leq$ 450, Class A building material

G. Water vapor permeance: ASTM E 96 Method B, > 10 perms (570 ng/Pa·s·m^2)

H. Field adhesion testing: ASTM D 4541, $\geq$ 30 psi (207 kPA) or exceeds strength of glass mat facing on glass mat gypsum substrates

I. Fire resistance: ASTM E 119, permitted for use in exterior walls of fire-resistance-rated construction assemblies. Refer to ICC-ESR 1233.

J. Building envelope air leakage: ASTM E 779 or 1827, $\leq$ 0.4 cfm/ft^2 (2 L/s·m^2)

K. Material air leakage: ASTM E 2178, primary air barrier and joint treatment < 0.004 cfm/ft2 at 1.57 psf (0.02 L/s•m2 at 75 Pa)

L. Assembly air leakage: ASTM E 2357, $\leq$ 0.04 cfm/ft^2 (0.2 L/s·m^2) air leakage after conditioning protocol

M. Fire propagation: NFPA 285, meets requirements for use on all Types of construction. Refer to ICC-ESR 1233.

N. Volatile Organic Compounds: SCAQMD Rule 1113, joint treatment and primary air barrier material $\leq$ 100 g/L

O. Water-resistive barrier: ICC ES 212, joint treatment and primary air barrier comply and are listed in a valid ICC ESR.

2.3 DESIGN CRITERIA

A. Structural (Wind and Axial Loads)
   1. Design for maximum allowable deflection normal to the plane of the wall: L/240. Where cladding dictates stiffer deflection criteria use cladding design criteria for maximum allowable deflection.
   2. Design for wind load in conformance with code requirements.

B. Moisture Control
   1. Prevent the accumulation of water in the wall assembly and behind the exterior wall cladding:
   2. Minimize condensation within the assembly.
   3. Drain water directly to the exterior where it is likely to penetrate components in the wall assembly (windows and doors, for example).
   4. Provide corrosion resistant flashing to direct water to the exterior in accordance with code requirements, including: above window and door heads, beneath window and door sills, at roof/wall intersections, floor lines, decks, intersections of lower walls with higher walls, and at the base of the wall.

C. Air Barrier Continuity: provide continuous air barrier assembly of compatible air barrier components.

D. Substrates
   1. Concrete Masonry Units: provide CMU surfaces in conformance with the applicable building code, and such that a void and pinhole free air barrier is achieved. Provide normal weight units with flush joints (struck flush with the surface) and allow for a minimum of 2 coats of the primary air barrier material applied by spray or roller Alternatively, for “rough” CMU wall surfaces allow for a cementitious parge coat to fill and level irregular surfaces, prior to 1 coat of the primary air barrier material.
   2. Concrete: provide concrete in conformance with the applicable building code.
   3. Sheathing: provide gypsum sheathing in compliance with ASTM C 1177, provide APA Exterior or Exposure 1 wood-based sheathing, and provide sheathing that meets required design wind pressures.

E. Mechanical Ventilation: maintain pressurization and indoor humidity levels in accordance with recommendations of ASHRAE (see 2005 ASHRAE Handbook—Fundamentals).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Inspect concrete and concrete masonry surfaces for:
   1. Contamination – algae, dirt, dust, efflorescence, form oil, fungus, grease, mildew or other foreign substances.
   2. Surface deficiencies – weak, friable, chalkiness, laitance, bugholes, and spalls.
   3. Cracks – measure crack width and record location of cracks.
   4. Damage or deterioration.
   5. Moisture content and moisture damage – use a moisture meter to determine if the surface is dry enough to receive the waterproof air barrier and record any areas of moisture damage or excess moisture.
   6. Flush masonry mortar joints completely filled with mortar.

B. Inspect sheathing application for compliance with applicable requirement:
   1. Exterior Grade and Exposure I wood based sheathing: E30U-2007, Engineered Wood Construction Guide, and the requirements of the applicable building code.
   2. Glass mat faced gypsum sheathing in compliance with ASTM C 1177: consult manufacturer's published recommendations and ICC ES Report. Conform with project requirements for wind load resistance.
   3. Cementitious sheathing – Consult manufacturer's published recommendations and ICC ES Report. Conform with project requirements for wind load resistance.

C. Report deviations from the requirements of project specifications or other conditions that might adversely affect the air and moisture barrier installation. Do not start work until deviations are corrected.

3.2 SURFACE PREPARATION

A. Concrete Masonry
   1. Surface must be structurally sound and free of weak or damaged surface conditions such as laitance or spalls. Surface must be clean, dry, frost-free, and free of any bond-inhibiting materials such as dust, dirt, oil, algae, mildew, salts, efflorescence, or any other surface contamination. Mortar joints must be struck flush with the surface.
   2. Remove excess mortar from masonry ties, lintels and shelf angles.
   3. Remove loose or damaged material by water-blasting, sandblasting or mechanical wire brushing. Remove surface contamination such as dirt or efflorescence by chemical or mechanical means. Repair surface defects such as spalls, voids and holes with fill (up to 1/8 inch thick) or Leveler (up to 1/4 inch thick).
   4. Repair non-structural cracks up to 1/8 inch (3 mm) wide by raking with a sharp tool to remove loose, friable material and blow clean with oil-free compressed air. Apply joint treatment material over crack, embed reinforcement (where applicable), and smooth joint treatment material with a trowel, drywall or putty knife to cover the reinforcement.

B. Concrete
   1. Surface must be structurally sound and free of weak or damaged surface conditions such as laitance, bugholes, or spalls. Surface must be clean, dry, frost-free, and free of any bond-inhibiting

materials such as dust, dirt, oil, form release, algae, mildew, salts, efflorescence, or any other surface contamination.

2. Remove projecting fins, ridges, form ties, and high spots by mechanical means.
3. Remove loose or damaged material by water-blasting, sandblasting or mechanical wire brushing. Remove form release by chemical or mechanical means. Repair surface defects such as honeycombs, pitting, spalls, voids or holes with Sto BTS Xtra (up to 1/8 inch [3 mm] thick) or Sto Leveler (up to 3/8 inch [9 mm] thick).
4. Repair non-structural cracks up to 1/8 inch (3 mm) wide by raking with a sharp tool to remove loose, friable material and blow clean with oil-free compressed air. Apply joint treatment material over crack, embed reinforcement (where applicable), and smooth joint treatment material with a trowel, drywall or putty knife to cover the reinforcement.

C. Sheathing
1. Remove and replace damaged sheathing.
2. Spot surface defects such as over-driven fasteners, knot holes, or other voids in sheathing with knife grade joint treatment material.
3. Spot fasteners with knife grade or coating joint treatment material.

3.3 INSTALLATION

A. Air/Moisture Barrier Installation over Exterior or Exposure I Wood-Based Sheathing (Plywood and OSB), Glass Mat Faced Gypsum Sheathing in compliance with ASTM C 1177, concrete, and concrete masonry (CMU) wall construction

B. Coordinate work with other trades to ensure air barrier continuity with connections at foundation, floor lines, flashings, lintels and shelf angles, openings and penetrations such as pipes, vents, windows and doors, masonry anchors, rafters or beams, joints in construction, projections such as decks and balconies, and roof line.

C. Transition Membrane Detailing: detail transition areas with Transition Membrane to achieve air barrier continuity. Refer to manufacturers instructions.

D. Floor line deflection joints up to 1 inch (25 mm) wide, static joints and transitions – sheathing to foundation, dissimilar materials (CMU to frame wall), flashing shingle lap transitions, wall to balcony floor slab or ceiling:
1. Apply air and moisture barrier liberally to properly prepared surfaces with brush, roller, or spray.
2. Place pre-cut lengths of Transition Membrane centered over the transition in the wet coating. At changes in plane crease the membrane and similarly place the membrane material in the wet coating.
3. Immediately top coat the membrane with additional coating and apply pressure with brush or roller to fully embed the membrane in the coating and achieve a smooth and wrinkle-free surface without gaps or voids.
4. Apply coating liberally along all top horizontal edges on walls and along all edges on balcony floor slabs to fully seal the edges.
5. Overlap minimum 2 inches (51 mm) at ends and adhere lap seams together with coating. Shingle lap vertical seams and vertical to horizontal intersections with minimum 2 inch (51 mm) overlap.

E. Movement joints up to 1 inch (25 mm) wide and up to $\pm$ 50% movement: masonry control joints, through wall joints in masonry or frame construction
1. Insert backer rod sized to friction fit in the joint (diameter 25% greater than joint width).
2. Recess the backer rod ½" (13 mm).
3. Apply the waterproof coating liberally to properly prepared surfaces with brush, roller, or spray along each side of the joint (not in the joint).

4. Immediately place the membrane by looping it into the joint against the backer rod surface to provide slack.
5. Embed the membrane in the wet coating along the sides of the joint by top coating with additional coating material and applying pressure with a brush or roller.

F. After the membrane installation is complete and the air and moisture barrier coating is dry:
1. Apply a final liberal coat of the coating to all top horizontal edges on walls to ensure waterproofing integrity. Similarly apply coating at all edges on balcony floor slabs.
2. Inspect the installed membrane for fish mouths, wrinkles, gaps, holes or other deficiencies. Correct fish mouths or wrinkles by cutting, then embedding the area with additional coating applied under and over the membrane.
3. Seal gaps, holes, and complex geometries at three dimensional corners.

G. Rough opening protection
1. Install rough opening protection. Refer to Manufacturers instructions.

H. Sheathing joints
1. Install joint treatment material with applicable reinforcement over sheathing joints. Refer to applicable manufacturer product bulletins.

I. Air and moisture barrier coating
1. Concrete – install one coat of barrier by spray or roller in a uniform, continuous wet film of 10 mils to the prepared concrete substrate. Do not install over working or moving joint sealants.
2. Concrete Masonry – install one liberal coat of barrier by spray or roller in a uniform, continuous film to the prepared concrete masonry substrate. Backroll spray applications. Allow to dry. Install a second liberal coat in a uniform, continuous film, and backroll spray applications, to achieve a void and pinhole free surface. Depending on the condition of the surface a minimum of 10 wet mils up to a maximum of 30 wet mils per coat is required. Apply additional coats if needed to achieve a void and pinhole free surface. Do not install over working or moving joint sealants.
3. Sheathing
    a. Glass mat faced gypsum sheathing: install one coat of barrier by spray or roller in a uniform, continuous film of 10 wet mils to the prepared glass mat gypsum substrate to achieve a void and pinhole free surface. Do not install over working or moving joint sealants.
    b. Plywood sheathing: install one coat of barrier by spray or roller in a uniform, continuous film of 10 wet mils to the prepared substrate to achieve a void and pinhole free surface. Do not install over working or moving joint sealants.
    c. OSB sheathing: install one coat of barrier by spray or roller in a uniform, continuous film of 10 wet mils to the prepared substrate and to a void and pinhole free surface. Inspect surface and touch-up with a second coat at raised wood strands. Do not install over working or moving joint sealants.

3.4 FIELD QUALITY CONTROL

A. Owner’s qualified testing agency or building envelope consultant shall perform inspections and tests.

B. Inspections: air barrier materials are subject to inspection to verify compliance with requirements.
1. Condition of substrates and substrate preparation.
2. Installation of primary air barrier material, accessory materials, and compatible auxiliary materials over structurally sound substrates and in conformance with architectural design details, contractor’s shop drawings, project mock-up, and manufacturer’s written installation instructions.
3. Air barrier continuity and connections without gaps and holes at foundation, floor lines, flashings, lintels and shelf angles, openings and penetrations such as pipes, vents, windows and doors,

masonry anchors, rafters or beams, joints in construction, projections such as decks and balconies, and roof line.

C. Tests: air barrier materials and assembly are subject to tests to verify compliance with performance requirements:
   1. Qualitative air leakage test: ASTM E 1186
   2. Quantitative air leakage test: ASTM E 779, E 783, and E 1827
   3. Adhesion test: ASTM D 4541
   4. Qualitative adhesion and compatibility testing: wet sealant manufacturer's field quality control adhesion test

D. Repair non-conforming substrates and air barrier material installation to conform with project requirements.

E. Take corrective action to repair and replace, reinstall, seal openings, gaps, or other sources of air leakage to conform with project performance requirements.

3.5 PROTECTION AND CLEANING

A. Protect air barrier materials from damage during construction caused by wind, rain, freezing, continuous high humidity, or prolonged exposure to sun light.

B. Protect air barrier materials from damage from trades, vandals, and water infiltration during construction.

C. Repair damaged materials to meet project specification requirements.

D. Clean spills, stains, soiling from finishes or other construction materials that will be exposed in the completed work with compatible cleaners.

E. Remove all masking materials after work is completed.

END OF SECTION 072726

SECTION 073113 - ASPHALT SHINGLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Asphalt shingles.
   2. Underlayment.
   3. Snow restraints system

B. Refer to Division 26 Sections for balance of information related to heat trace.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples: For each exposed product and for each color and blend specified.

C. Product test reports.

D. Research/evaluation reports.

E. Maintenance data.

F. Warranties: Sample of special warranties.

1.3 QUALITY ASSURANCE

A. Fire-Resistance Characteristics: Where indicated, provide asphalt shingles and related roofing materials identical to those of assemblies tested for fire resistance per test method below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.
   1. Exterior Fire-Test Exposure: Class A ASTM E 108 or UL 790, for application and roof slopes indicated.

B. Preinstallation Conference: Conduct conference at Project site.

1.4 WARRANTY

A. Special Warranty: Standard form in which manufacturer agrees to repair or replace asphalt shingles that fail in materials or workmanship within specified warranty period.
   1. Material Warranty Period: 30 years from date of Substantial Completion, prorated, with first three years nonprorated.
   2. Algae-Discoloration Warranty Period: Asphalt shingles will not discolor five number years from date of Substantial Completion.
   3. Impact Resistance: UL 2218, Class 4.

4. Wind-Speed Warranty Period: Asphalt shingles will resist blow-off or damage caused by wind speeds of up to 130 mph.

PART 2 - PRODUCTS

2.1 GLASS-FIBER-REINFORCED ASPHALT SHINGLES

A. Laminated-Strip Asphalt Shingles: ASTM D 3462/ ASTM D 3462M, laminated, multi-ply overlay construction, glass-fiber reinforced, mineral-granule surfaced, and self-sealing, high profile, "architectural".
   1. Basis-of-Design Product: Timberline HD Lifetime High Definition Shingles as manufactured by GAF.
   2. Physical Characteristics:
      a. ASTM 3018 Type I – Self-Sealing; UL Certification of ASTM D 3462, ASTM D 3161/UL 997 Wind Resistance
      b. UL 2390/ASTM D 6381 Class H Wind Resistance
      c. UL 790 Class A Fire Resistance
      d. Impact Resistance: UL 2218, Class 4.
      e. Butt Edge: Straight cut.
      f. Strip Size: Manufacturer's standard
      g. Algae Resistance: Granules treated to resist algae discoloration.
      h. Color and Blends: Refer to Drawings

2.2 UNDERLAYMENT MATERIALS

A. Self-Adhering Sheet Underlayment, High Temperature: Minimum of 40-mil- thick, slip-resisting, polyethylene-film-reinforced top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release paper backing; cold applied. Provide primer for adjoining concrete or masonry surfaces to receive underlayment.

2.3 SNOW RESTRAINTS SYSTEMS

A. Basis of Design: Provide products as manufactured by TRA Snow and Sun, American Fork, Utah, or approved;
   1. Alpine Snowgaurds
   2. Berger & Company

B. Style: Clips
   1. Snow Guard Material: 16 gauge hot dipped galvanized paintlock steel.
   2. Manufacturer to confirm spacing and suitability of bracket type.
   3. Finish: Powder coated.
   4. Color: As selected.

2.4 ACCESSORIES

A. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.

B. Roofing Nails: ASTM F 1667; aluminum, stainless-steel, copper, or hot-dip galvanized-steel wire shingle nails, minimum 0.120-inch- diameter, barbed smooth shank, sharp-pointed, with a minimum 3/8-

inch- diameter flat head and of sufficient length to penetrate 3/4 inch into solid wood decking or extend at least 1/8 inch through OSB or plywood sheathing.

1. Where nails are in contact with metal flashing, use nails made from same metal as flashing.

2.5 METAL FLASHING AND TRIM

A. General: Comply with requirements in Division 07 Section "Sheet Metal Flashing and Trim."

B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of the item.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
   1. Examine roof sheathing to verify that sheathing joints are supported by framing and blocking or metal clips and that installation is within flatness tolerances.
   2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored; and that provisions have been made for flashings and penetrations through asphalt shingles.

B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

A. General: Comply with underlayment manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.

B. Install nail base according to manufacturers latest recommendations, install with end joints staggered to avid having insulation joints coincide with deck joints. Do not leave insulation exposed to weather, cover waterproofing completed roof system immediately after installation.
   1. Temporarily seal exposed insulation edges at the end of each day
   2. Remove and replace installed insulation that has become wet or damaged with new isulation.

C. Self-Adhering Sheet Underlayment: Install, wrinkle free, on roof deck. Comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Lap in direction to shed water. Lap sides not less than 3-1/2 inches. Lap ends not less than 6 inches staggered 24 inches between courses. Roll laps with roller. Cover underlayment within seven days.
   1. Prime surfaces as required by manufacturer.
   2. Eaves and Rakes: Extend from edges 24 inches beyond interior face of exterior wall.
   3. Valleys, Hips: Extend 18 inches on each side.
   4. Sidewalls: Extend 18 inches, and return vertically against sidewall not less than 4 icnhes
   5. Provide double layer at all locations where installed.
   6. Extend underlayment 24 inches past exterior interior plane of exterior wall, refer to ENERGY STAR for additional information.

D. Concealed Valley Lining: For closed-cut valleys. Comply with NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems." Install underlayment centered in valley and fastened to roof deck.

1. Lap roof-deck underlayment over valley underlayment at least 6 inches (150 mm).
2. Install a 36-inch- (914-mm-) wide strip of granular-surfaced valley lining, with granularsurface face up, centered in valley. Lap ends of strips at least 12 inches (300 mm) in direction to shed water, and seal with asphalt roofing cement. Fasten to roof deck.

3.3 METAL FLASHING INSTALLATION

A. General: Install metal flashings and other sheet metal to comply with requirements in Division 07 Section "Sheet Metal Flashing and Trim."
   1. Install metal flashings according to recommendations in ARMA's "Residential Asphalt Roofing Manual" and asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."

B. Apron Flashings: Extend lower flange over and beyond each side of downslope asphalt shingles and up the vertical surface.

C. Step Flashings: Install with a headlap of 2 inches (50 mm) and extend over the underlying asphalt shingle and up the vertical surface. Fasten to roof deck only.

D. Cricket or Backer Flashings: Install against the roof-penetrating element extending concealed flange beneath upslope asphalt shingles and beyond each side.

E. Rake Drip Edges: Install rake drip-edge flashings over underlayment and fasten to roof deck.

F. Eave Drip Edges: Install eave drip-edge flashings below underlayment and fasten to roof sheathing.

G. Pipe Flashings: Form flashing around pipe penetrations and asphalt shingles. Fasten and seal to asphalt shingles as recommended by manufacturer.

3.4 ASPHALT SHINGLE INSTALLATION

A. General: Install asphalt shingles according to manufacturer's written instructions, recommendations in ARMA's "Residential Asphalt Roofing Manual," and asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."

B. Install starter strip along lowest roof edge, consisting of an asphalt shingle strip with tabs removed with self-sealing strip face up at roof edge.
   1. Extend asphalt shingles 1/2 inch over fasciae at eaves and rakes.
   2. Install starter strip along rake edge.

C. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.

D. Fasten asphalt-shingle strips with a minimum of four to six roofing nails located according to manufacturer's written instructions.
   1. Where roof slope is 4:12 or less, seal asphalt shingles with asphalt roofing cement spots.
   2. When ambient temperature during installation is below 50 deg F (10 deg C), seal asphalt shingles with asphalt roofing cement spots.

A. Closed-Cut Valleys: Extend asphalt-shingle strips from one side of valley 12 inches beyond center of valley. Use one-piece shingle strips without joints in valley. Fasten with extra nail in upper end of shingle. Install asphalt-shingle courses from other side of valley and cut back to a straight line 2 inches (50 mm) short of valley centerline. Trim upper concealed corners of cut-back shingle strips.

1. Do not nail asphalt shingles within 6 inches of valley center.
2. Set trimmed, concealed-corner asphalt shingles in a 3-inch- wide bed of asphalt roofing cement.

A. Ridge and Hip Cap Shingles: Maintain same exposure of cap shingles as roofing shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds. Fasten with roofing nails of sufficient length to penetrate sheathing.
   1. Fasten ridge cap asphalt shingles to cover ridge vent without obstructing airflow.

END OF SECTION 073113

SECTION 074213 - METAL WALL PANELS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes exposed fastener lap seam metal wall panels and soffits

1.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design metal wall panel assembly, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Structural Performance: Provide metal wall panel assemblies capable of withstanding the effects the following loads and stresses within limits and under conditions indicated, based on testing according to ASTM E 1592:
   1. Wind Loads: Determine loads based on the following minimum design wind pressures:
      a. Uniform pressure of 20 lbf/sq. ft., acting inward or outward.
   2. Deflection Limits: Metal wall panel assemblies shall withstand wind loads with horizontal deflections no greater than 1/180 of the span.

C. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E 331 at the following test-pressure difference:
   1. Test-Pressure Difference: 6.24 lbf/sq. ft..
   2. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

D. Fire-Test-Response Characteristics: Provide metal wall panels and system components with the following fire-test-response characteristics, as determined by testing identical panels and system components per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.

1.3 SUBMITTALS

A. Shop Drawings: Show fabrication and installation layouts of metal wall panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details. Distinguish between factory-, shop- and field-assembled work.

B. Samples: For each type of exposed finish required.

C. Delegated-Design Submittal: For metal wall panel assembly indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

D. Coordination Drawings: Exterior elevations drawn to scale and coordinating penetrations and wall-mounted items.

E. Product test reports.

F. Maintenance data.

G. Warranties: Samples of special warranties.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer.

B. Fire-Resistance Ratings: Where indicated, provide metal wall panels identical to those of assemblies tested for fire resistance per ASTM E 119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

C. Preinstallation Conference: Conduct conference at Project site.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Remove strippable protective covering on metal panels as panels are being installed. Do not leave the film on installed panels.

1.6 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.7 COORDINATION

A. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal wall panel assemblies that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: Two years from date of Substantial Completion.

B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal wall panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
   1. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 EXPOSED-FASTENER, LAP-SEAM METAL WALL PANELS

A. Provide factory-formed metal panels designed to be field assembled by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps. Include accessories required for weathertight installation.

B. Corrugated-Profile, Exposed-Fastener Metal Roof Panels: Formed with alternating curved ribs spaced at 2.67 inches o.c. across width of panel.
   1. Basis of Design: Subject to compliance with requirements, provide panels as manufactured by Western States Metal Roofing or a comparable product, or approved equal.
      a. Material: Steel Sheet: A 606-4 Weathering Steel: ASTM A 606-04 High Strength Low Alloy Weathering Steel, 22 gauge.
      b. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil
   2. Panel Height: 7/8 inches
   3. Color: Streak Rust
   4. Matte finish

2.2 CONCEALED FASTENER SOFFIT

A. Flush-Profile, Concealed-Fastener Metal Soffit Panels: Formed with vertical panel edges and intermediate stiffening ribs symmetrically spaced between panel edges; with flush joint between panels.
   1. Basis-of-Design Product: Subject to compliance with requirements, provide Berridge Manufacturing Company; FW-12 or approved equal.
      a. Nominal Thickness: 22 gauge
   2. Metallic-Coated Steel Sheet: Aluminum-zinc alloy-coated steel sheet complying with ASTM A 792/A 792M, Class AZ50 coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
      a. Color: As selected
   3. Texture: Smooth
   4. Width: 12 inches
   5. Height: 1 ½ inches

2.3 MISCELLANEOUS MATERIALS

A. Miscellaneous Metal Subframing and Furring: ASTM C 645, cold-formed, metallic-coated steel sheet, ASTM A 653/A 653M, G90 coating designation or ASTM A 792/A 792M, Class AZ50 aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.

B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.
   1. Closures: Provide closures at eaves and rakes, fabricated of same metal as metal panels.
   2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
   3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch-thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.

D. Panel Fasteners: Self-tapping screws designed to withstand design loads.
   1. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.

E. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.
   1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing; 1/2 inch wide and 1/8 inch thick.
   2. Joint Sealant: ASTM C 920; as recommended in writing by metal panel manufacturer.
   3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.

2.4 FABRICATION

A. General: Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

C. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.

D. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.
   1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
   2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
   3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
   4. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
   5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
   6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.
      a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

2.5 FINISHES

A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Panels and Accessories:
   1. Two-Coat Fluoropolymer: AAMA 621 Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
   2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of 0.35 mil.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.
   1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.
   2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall panel manufacturer.
      a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal panel manufacturer's written recommendations.

3.3 METAL PANEL INSTALLATION

A. Lap-Seam Metal Panels: Fasten metal panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.
   1. Lap ribbed or fluted sheets one full rib. Apply panels and associated items true to line for neat and weathertight enclosure.
   2. Provide metal-backed washers under heads of exposed fasteners bearing on weather side of metal panels.
   3. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.
   4. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.
   5. Flash and seal panels with weather closures at perimeter of all openings.

B. Watertight Installation:
   1. Apply a continuous ribbon of sealant or tape to seal lapped joints of metal panels, using sealant or tape as recommend by manufacturer on side laps of nesting-type panels; and elsewhere as needed to make panels watertight.
   2. Provide sealant or tape between panels and protruding equipment, vents, and accessories.

3. At panel splices, nest panels with minimum 6-inch (152-mm) end lap, sealed with sealant and fastened together by interlocking clamping plates.

C. Metal Liner Panels: Install panels on inside of girts with flush appearance on the inside.

D. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

E. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed or exposed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a service representative authorized by metal wall panel manufacturer to inspect completed installation. Submit written report.

B. Water-Spray Test: After installation, test area of assembly as directed by Architect for water penetration according to AAMA 501.2.

C. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect completed metal wall panel installation, including accessories.

D. Remove and replace metal wall panels where tests and inspections indicate that they do not comply with specified requirements.

E. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.

3.5 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

B. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

C. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 074213

SECTION 074625 - WOOD SIDING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes wood siding.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each exposed product and for each color and finish specified.

C. Shop Drawings.

1.4 INFORMATIONAL SUBMITTALS

A. Sample warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.6 QUALITY ASSURANCE

A. Grading Agency Qualifications: An independent testing and inspecting agency recognized by authorities having jurisdiction as qualified to label siding for compliance with referenced grading rules.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect materials during shipment, storage and construction against damage. If material is air dried, stickers of a minimum of 10mm shall be placed between each layer of boards when packed. If material is kiln dried, material shall be dense packed and wrapped.

B. All units shall be individually strapped to wood pallets or blocking of a minimum thickness to allow the egress of lift forks using high strength strapping with a minimum of 4 straps per crate.

C. Store a minimum of 4 inches off the ground in a dry location and cover with polyethylene to protect from contact with materials which would cause staining or discoloration.

PART 2 - PRODUCTS

2.1 EXTERIOR SIDING

A. Basis of Design: Tongue and Groove flush joint
   1. Size: As selected
   2. Trim Pieces: Corner boards, size as indicated.
   3. Exposed Surface: Smooth finish (S4S)
   4. Grade: Western Red Cedar (WRC) Clear grade, No 2 or better

B. Finish: Stained under Division 09 Section “Stain and Transparent Finishing”

2.2 DRAINAGE MAT

A. Basis of Design Driwall Rainscreen 020-1 as manufactured by Keene Building Products.

B. Physical Characteristics: Three-dimensional mat heat laminated to a non-woven lightweight, vapor permeable fabric. The monofilament mat is heat welded at the junctions to form a resilient structure that isolates veneer from the back-up.
   1. 0.25 inches (6 mm) thick.
   2. 14.5 oz/sq. yd. (489 g/sq m) total weight.
   3. 48 inches (123 mm) wide.

C. Performance: Drainage of moisture and ventilation between veneer and back-up support.

D. Material: UV stabilized polypropylene.
   1. Class A flame spread per ASTM E84.
   2. Hydrophobic compound.
   3. Resistant to chemicals.
   4. Does not support mold growth.

2.3 ACCESSORIES

A. Weather barrier, Refer to Division 07 Section ”Weather Barrier”

B. Sealer: As recommended by fabricator to match architects sample finish.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:
   1. Layout: Verify layout of work before beginning installation.
   2. Existing Conditions: Examine substrate before beginning installation.
      a. Examine surfaces for inadequate anchorage, drainage, foreign material, moisture and unevenness that would prevent execution and quality of application of siding systems.
      b. Blocking: Ensure proper blocking provided under Division 06 Section “Rough Carpentry”

3. Notification: Notify General Contractor of unsatisfactory conditions in writing with copy to Architect.

B. Acceptance: Beginning of work means acceptance of existing conditions by installer.

3.2 PREPARATION

A. Acclimate wood for a minimum of 3 to 5 days in a well ventilated storage, or as recommended by manufacturer.

B. General: Install in accordance with manufacturer's instructions.
1. Inspection of Wall Conditions: Ensure that the substrate is free from structural defects.

C. Siding and Finish Trim Boards:
1. Acclimatization: Store siding materials in dry location until moisture content has reached average 12 percent and maximum of 14 percent for individual pieces.

D. Furring Strips: Install true to lines and levels. Space furring and starter courses according to size and orientation of siding as indicated, maximum 16 inches o.c.

E. Store siding in area that has good air circulation, protected from direct sunlight, water, and other elements, store flat off the ground at least 4 inches.

3.3 INSTALLATION

A. Install products in continuous straight-line courses according to manufacturer's written instructions and recommendations.

B. Seal all edges and field cuts according to manufacturers recommendations.

C. Hand nail to minimize overdriving and damage to the siding.

D. Installation of Drainage Mat:
1. Install building paper or house wrap and flashing to manufacturers' recommendations.
2. Place drainage mat horizontally against exterior wall, fabric side out, entangled core to the building interior. Start at the bottom of the wall and work up.
3. Mechanically fasten with a staple hammer, large head nail or washer and screw one fastener for each square foot (0.1 sq. m). When installing over concrete or block back-up walls that do not accept mechanical fasteners hold in place with small dabs of glue every 2.0 feet (0.61 m). Do not fasten through flashing.
4. Seam adjacent piece with the selvage edge overlapping the top of the lower drainage mat piece. Shingle so that selvage edge is installed toward the bottom of the wall.
5. Install siding, shingle or fiber-cement siding according to manufacturers' recommendations. When choosing a fastener, allow for thickness of drainage mat. Pneumatic nail guns can be used if nails meet manufacturers' recommendations and air pressure and depth gauge is set to fasten nail snug with surface.

3.4 ADJUSTING

A. At completion of Project, replace warped or damaged siding as directed by the Architect.

END OF SECTION 074625

SECTION 074646 – CEMENTITOUS PANELING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes the following:
   1. Cementitious panels
   2. Soffit

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples: For siding including related accessories.

C. Qualification Data: For qualified siding Installer.

D. Product certificates.

E. Product test reports.

F. Research/evaluation reports.

G. Maintenance data.

H. Warranty: Sample of special warranty.

1.3 QUALITY ASSURANCE

A. Labeling: Provide siding that is tested and labeled according to ASTM C 1186 by a qualified testing agency acceptable to authorities having jurisdiction.

B. Source Limitations: Obtain each type, color, texture, and pattern of siding, including related accessories, from single source from single manufacturer.

C. Preinstallation Conference: Conduct conference at Project site.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Store products off the ground, on a flat surface, and under a roof or separate waterproofing covering.

1.5 WARRANTY

A. Special Warranty: Standard form in which manufacturer agrees to repair or replace siding that fail(s) in materials or workmanship within specified warranty period.
   1. Warranty Period: 50 years from date of Substantial Completion.
   2. Warranty Period Finish: 15 years from date of Substantial Completion

PART 2 - PRODUCTS

2.1 FIBER-CEMENT PANEL

A. General: ASTM C 1186, Type A, Grade II, fiber-cement board, noncombustible when tested according to ASTM E 136; with a flame-spread index of 25 or less when tested according to ASTM E 84.
   1. Basis of Design: Subject to compliance with requirements, provide products as manufactured by Allura USA a Plycem Company OR a comparable product by one of the following:
      a. CertainTeed Corp.
      b. GAF Materials Corporation.
      c. James Hardie
   2. Physical Performance:
      a. Surface Burning Characteristics: Flame spread index of 0, smoke developed index of 0, maximum; when tested in accordance with ASTM E 84. .
      b. Combustibility: Noncombustible, when tested in accordance with ASTM E 136, ULC S135 and ULC S114.
      c. Flexural Strength: At least 1450 psi (10 MPa) when in equilibrium condition, and at least 1015 psi (7 MPa) when in wet condition, tested in accordance with ASTM C 1185.
      d. Freeze Thaw Resistance: At least 80 percent flexural strength retained, when tested in accordance with ASTM C 1185.
      e. Water Tightness: No water droplets on underside, when tested in accordance with ASTM C 1185.
   3. Factory Primed
   4. Field Finish, refer to Division Section “Exterior Painting”.
      a. Color: As selected by Architect.
   5. Style and Finish: Refer to Drawings.

B. Soffit Board: Manufacturers standard vented and nonvented soffit, smooth.

2.2 ACCESSORIES

A. Aluminum Trim Accessories: Where aluminum accessories are indicated, provide accessories complying with AAMA 1402.
   1. Texture: Smooth.
   2. Nominal Thickness: 0.019 inch.
   3. Finish: Primed, field painted.
   4. Basis of Design; Fiber Cement Trim System manufactured by EasyTrim Reveals.
      a. LAP Trim System
      b. Panel System

B. Flashing: Provide aluminum flashing complying with Division 07 Section "Sheet Metal Flashing and Trim" at window and door heads and where indicated.
   1. Finish for Aluminum Flashing: High-performance organic finish, same color as siding.

C. Fasteners: For fastening to wood, use siding nails of sufficient length to penetrate a minimum of 1 inch into substrate, refer to manufacturers recommendation in technical documents.

D. Trim: Fascia trim, and other trim pieces as indicated on Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of siding and related accessories.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Comply with siding manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.
   1. Do not install damaged components.
   2. Use trim details indicated on Drawings
   3. Touch-up all field cut edges before installing
   4. Pre-Drill nail holes if necessary to prevent breakage.

B. Allow space between both ends of siding panels that butt against trim for thermal movement; seal joint between panel and trim with exterior grade sealant

C. Install siding, soffit and related accessories.
   1. Install fasteners no more than 24 inches o.c.

D. Install joint sealants as specified in Division 07 Section "Joint Sealants" and to produce weathertight installation.

E. Install sheet metal flashing above door and window casings and horizontal trim in field of siding.

F. Do not install siding less than 6 inches (150 mm) from surface of ground nor closer than 2 inch to roofs, patios, porches, and other surfaces where water may collect.

G. After installation, seal all joints except lap joints of lap siding. Seal around all penetrations.

H. Paint all exposed cut edges.

3.3 ADJUSTING AND CLEANING

A. Remove damaged, improperly installed, or otherwise defective materials and replace with new materials complying with specified requirements.

B. Clean finished surfaces according to manufacturer's written instructions and maintain in a clean condition during construction.

END OF SECTION 074646

SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Manufactured reglets and counterflashing.
   2. Formed roof drainage sheet metal fabrications.
   3. Formed low-slope roof sheet metal fabrications.
   4. Formed wall sheet metal fabrications.

1.2 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim assemblies as indicated shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

B. SPRI Wind Design Standard: Manufacture and install flashings tested according to SPRI ES-1 and capable of resisting the following design indicated.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show installation layouts of sheet metal flashing and trim, including plans, elevations, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.
   1. Include details for forming, joining, supporting, and securing sheet metal flashing and trim, including pattern of seams, termination points, fixed points, expansion joints, expansion-joint covers, edge conditions, special conditions, and connections to adjoining work.

C. Samples: For each exposed product and for each finish specified.

D. Maintenance data.

E. Warranty: Sample of special warranty.

1.4 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

B. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or shown on Drawings.

C. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
   1. Build mockup including roof eave, sill, parapet, head, jamb, fascia, fascia trim and apron flashing,

approximately 10 feet long, including supporting construction cleats, seams, attachments, underlayment, and accessories.

2. Refer to Division 01 Section “Mockups” for additional information on the incorporate in to the exterior envelope mock-up.

D. Preinstallation Conference: Conduct conference at Project site.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.

B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to the extent necessary for the period of sheet metal flashing and trim installation.

PART 2 - PRODUCTS

2.1 SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.

B. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304, dead soft, fully annealed; 4 (polished directional satin) finish.

C. Metallic-Coated Steel Sheet: Restricted flatness steel sheet, metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation; structural quality.
   a. Thickness: 26 gauge unless otherwise indicated.
2. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.
3. Exposed Coil-Coated Finish:
   a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
   b. Color: As selected by Architect from manufacturers full range, at minimum 10 custom colors.

2.2 UNDERLAYMENT MATERIALS

A. Felt: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.

B. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 mils thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
1. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F.
2. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F.

C. Slip Sheet: Building paper, 3-lb/100 sq. ft. minimum, rosin sized.

2.3 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.

B. Fasteners: Suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
   1. General:
      a. Concealed Fasteners: Self-drilling screws, gasketed, with hex-washer head.
      b. Exposed Fasteners: Blind fasteners.
      c. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
      d. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
   2. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
   3. Fasteners for Aluminum-Zinc Alloy-Coated Steel Sheet: Hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329 or Series 300 stainless steel.
   4. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.

C. Solder:
   1. For Zinc-Coated (Galvanized) Steel: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead or Grade Sn60, 60 percent tin and 40 percent lead.

D. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.

E. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.4 REGLETS

A. Reglets: Units of type, material, and profile indicated, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated with factory-mitered and -welded corners and junctions.

2.5 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, geometry, metal thickness, and other characteristics of item indicated. Fabricate items at the shop to greatest extent possible.
   1. Obtain field measurements for accurate fit before shop fabrication.
   2. Form sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
   3. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces exposed to view.

B. All flashing adjacent to the storefront, windows and storefront assemblies shall match the finish and appearance of the exposed metal.

C. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant.

D. Expansion Provisions: Where lapped expansion provisions cannot be used, form expansion joints of

intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.

E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

F. Seams (For metals being soldered): Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
   1. Joints sealed with sealant and riveted only will not be accepted.

G. Seams (for metals painted or with coated finishes): Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.

2.6 ROOF DRAINAGE SHEET METAL FABRICATIONS

A. Hanging Gutters: Fabricate to cross section indicated, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in roll form on-site. Furnish flat-stock gutter spacers and gutter brackets fabricated from same metal as gutters, of size recommended by SMACNA but not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, and gutter accessories from same metal as gutters.
   1. Refer to Drawings for gutters style and sizing.
   2. Fabricate from the following materials: Galvanized Steel, 0.0276 inch (24 gauge)
   3. Shape: Half round
   4. Sizes: 6SB and 8SB inches

B. Downspouts: Fabricate downspouts complete with mitered elbows. Furnish with metal hangers, from same material as downspouts, and anchors.
   1. Hanger Style: As selected.
   2. Fabricate from the following materials: Galvanized Steel, 0.0276 inch (24 gauge)
   3. Style: Corrugated, 4 inches
   4. Accessories: Round Elbows, straps and other items as required to comply with design.

C. Conductor Heads: Fabricate conductor heads with flanged back and stiffened top edge and of dimensions and shape required, complete with outlet tubes. Fabricate from the following materials:
   1. Galvanized Steel: 0.028 inch thick.

2.7 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

A. Roof-Edge Fascia: Fabricate in minimum 96-inch- long, but not exceeding 10-foot- long, sections. Furnish with 6-inch- wide, joint cover plates.
   1. Basis of Design: Terminedge as manufactured by OMG Roofing Products (formally W.P Hickman Company)
   2. Face Height: 6.75 inches.
   3. Color As selected by architect.

B. Copings: Fabricate in minimum 96-inch- long, but not exceeding 10-foot- long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and drill elongated holes for fasteners on interior leg. Miter corners, seal, and solder or weld watertight.

C. Base Flashing.

D. Counterflashing and Flashing Receivers.

E. Roof-Penetration Flashing.

F. Gravel stop

2.8 WALL SHEET METAL FABRICATIONS

A. Through-Wall Flashing: Fabricate continuous flashings in minimum 96-inch- long, but not exceeding 12-foot- long, sections, under copings, at shelf angles, and where indicated. Fabricate discontinuous lintel, sill, and similar flashings to extend 6 inches beyond each side of wall openings. Form with 2-inch- high, end dams where flashing is discontinuous.
1. Stainless Steel: 0.016 inch thick.

B. Opening Flashings in Frame Construction: Fabricate head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings. Form head and sill flashing with 2-inch- high, end dams.
1. Stainless Steel: 0.016 inch thick.

C. Wall Expansion-Joint Cover:
1. Stainless Steel: 0.019 inch thick.

D. All joints shall be soldered, rivets will not be accepted.

2.9 FINISHES

A. Architect reserves the right to reject any finishes, dented, scratched or damaged or attempt at repairing in a manner that does not meet industry standards.

PART 3 - EXECUTION

3.1 UNDERLAYMENT INSTALLATION

A. Polyethylene Sheet: Install polyethylene sheet with adhesive for anchorage. Apply in shingle fashion to shed water, with lapped and taped joints of not less than 2 inches.

B. Felt Underlayment: Install felt underlayment with adhesive for temporary anchorage. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches.

C. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Comply with temperature restrictions of underlayment manufacturer for installation; use primer rather than nails for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps with roller. Cover underlayment within 14 days.

3.2 INSTALLATION, GENERAL

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement so that completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
1. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
3. Space cleats not more than 12 inches apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.
4. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool

marks.
5. Install sealant tape where required.
6. Torch cutting of sheet metal flashing and trim is not permitted.

B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by SMACNA.
1. Coat back side of stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.
2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene sheet.

C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.

D. Fastener Sizes: Use fasteners of sizes that will penetrate wood sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.

E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

F. Seal joints as shown and as required for watertight construction.

G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches, except reduce pre-tinning where pre-tinned surface would show in completed Work.
1. Do not solder metallic-coated steel and aluminum sheet.
2. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
3. Joints sealed with sealant and riveted only will not be accepted.

3.3 ROOF DRAINAGE SYSTEM INSTALLATION

A. General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.

B. Hanging Gutters: Join sections with riveted and soldered joints. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchor them in position. Provide end closures and seal watertight with sealant. Slope to downspouts.
1. Install gutter with expansion joints at locations indicated, but not exceeding, 50 feet apart. Install expansion-joint caps.
2. Install continuous gutter screens on gutters with noncorrosive fasteners, hinged to swing open for cleaning gutters.

C. Downspouts: Join sections with 1-1/2-inch telescoping joints. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches o.c.

D. Splash Pans: Install where downspouts discharge on low-slope roofs <Insert surface>. Set in asphalt roofing cement or elastomeric sealant compatible with the substrate.

E. Parapet Scuppers: Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.

F. Conductor Heads: Anchor securely to wall, with elevation of conductor head rim at minimum of 1 inch below scupper or gutter discharge.

G. Expansion-Joint Covers: Install expansion-joint covers at locations and of configuration indicated. Lap joints a minimum of 4 inches in direction of water flow.

3.4 ROOF FLASHING INSTALLATION

A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in SMACNA's "Architectural Sheet Metal Manual" and as indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 3-inch centers.

C. Copings: Anchor to resist uplift and outward forces according to recommendations in SMACNA's "Architectural Sheet Metal Manual" and as indicated.
1. Interlock exterior bottom edge of coping with continuous cleat anchored to substrate at 16-inch centers.
2. Anchor interior leg of coping with washers and screw fasteners through slotted holes at 24-inch centers.

D. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4 inches over base flashing. Install stainless-steel draw band and tighten.

E. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches over base flashing. Lap counterflashing joints a minimum of 4 inches and bed with sealant.

F. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

3.5 WALL FLASHING INSTALLATION

A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to SMACNA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

B. Through-Wall Flashing: Installation of through-wall flashing is specified in Division 07 Section “Air Resistive Barrier Wall System” and Division 04 “Unit Masonry”

C. Opening Flashings in Frame Construction: Install continuous head, sill, jamb and similar flashings to extend 4 inches beyond wall openings.

3.6 MISCELLANEOUS FLASHING INSTALLATION

A. Overhead-Piping Safety Pans: Suspend pans independent from structure above as indicated on Drawings. Pipe and install drain line to plumbing waste or drainage system.

B. Equipment Support Flashing: Coordinate installation of equipment support flashing with installation of roofing and equipment. Weld or seal flashing with elastomeric sealant to equipment support member.

3.7 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

B. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

3.8 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder and sealants.

C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.

END OF SECTION 076200

SECTION 077200 - ROOF ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes the following:
   1. Roof hatches

1.2 SUBMITTALS

A. Product Data: For each type of roof accessory indicated.

B. Shop Drawings: For roof accessories.

C. Samples: For each exposed product and for each color and texture specified.

D. Coordination Drawings: Roof plans, drawn to scale, and coordinating penetrations and roof-mounted items.

E. Operation and maintenance data.

F. Warranty: Sample of special warranty.

1.3 WARRANTY

A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finishes or replace roof accessories that show evidence of deterioration of factory-applied finishes within 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 METAL MATERIALS

A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation.
   1. Exposed Coil-Coated Finish: Two-coat fluoropolymer finish; AAMA 621; system consisting of primer and fluoropolymer color topcoat containing not less than 70 percent PVDF resin by weight.

B. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, AZ50 coated.
   1. Factory Prime Coating: Where field painting is indicated, apply pretreatment and white or light-colored, factory-applied, baked-on epoxy primer coat, with a minimum dry film thickness of 0.2 mil.
   2. Exposed Coil-Coated Finish: Two-coat fluoropolymer finish; AAMA 621; system consisting of primer and fluoropolymer color topcoat containing not less than 70 percent PVDF resin by weight

C. Aluminum Sheet: ASTM B 209, manufacturer's standard alloy for finish required, with temper to suit forming operations and performance required.
   1. Mill Finish: As manufactured.
   2. Factory Prime Coating: Where field painting is indicated, apply pretreatment and white or light-colored, factory-applied, baked-on epoxy primer coat, with a minimum dry film thickness of 0.2 mil.
   3. Exposed Coil-Coated Finish: Two-coat fluoropolymer finish; AAMA 620; system consisting of primer and fluoropolymer color topcoat containing not less than 70 percent PVDF resin by weight.

D. Aluminum Extrusions and Tubes: ASTM B 221, manufacturer's standard alloy and temper for type of use, finished to match assembly where used, otherwise mill finished.

E. Stainless-Steel Sheet and Shapes: ASTM A 240/A 240M or ASTM A 666, Type 304.

F. Steel Shapes: ASTM A 36/A 36M, hot-dip galvanized according to ASTM A 123/A 123M unless otherwise indicated.

2.2 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.

B. Fasteners: Roof accessory manufacturer's recommended fasteners suitable for application and metals being fastened. Match finish of exposed fasteners with finish of material being fastened. Provide nonremovable fastener heads to exterior exposed fasteners.

C. Sealants: As recommended by roof accessory manufacturer for installation indicated.

2.3 ROOF HATCH

A. Roof Hatches: Metal roof-hatch units with lids and insulated double walled curbs, welded or mechanically fastened and sealed corner joints, continuous lid-to-curb counterflashing and weathertight perimeter gasketing, integral metal cant, stepped integral metal cant raised the thickness of roof insulation, and integrally formed deck-mounting flange at perimeter bottom.
   1. Basis of Design: Subject to compliance with requirements, provide (Thermally Broken) insulated series as manufactured by Bilco Company, or comparable product by one of the following manufacturers:
      a. Babcock-Davis.
      b. J. L. Industries, Inc.
      c. Nystrom.
      d. O'Keeffe's Inc.

B. Size: Refer to Drawings

C. Performance characteristics:
   1. Cover shall be reinforced to support a minimum live load of 40 psf with a maximum deflection of 1/150th of the span or 20 psf wind uplift.
   2. Operation of the cover shall be smooth and easy with controlled operation throughout the entire arc of opening and closing.
   3. Operation of the cover shall not be affected by temperature.
   4. Entire hatch shall be weather tight with fully welded corner joints on cover and curb.

D. Cover: Shall be select: 14 gauge paint bond G-90 galvanized steel or 11 gauge aluminum with a 3 inches beaded flange with formed reinforcing members. Cover shall have a heavy extruded EPDM rubber gasket that is bonded to the cover interior to assure a continuous seal when compressed to the top surface of the curb.

E. Cover insulation: Shall be fiberglass of 1 inches thickness, fully covered and protected by a metal liner 22 gauge (.8mm) paint bond G-90 galvanized steel.

F. Curb: Shall be 12 inches in height and of [select: 14 gauge paint bond G-90 galvanized steel. The curb shall be formed with a 3-1/2 inches flange with 7/16 inches holes provided for securing to the roof deck. The curb shall be equipped with an integral metal capflashing of the same gauge and material as the curb, fully welded at the corners, that features the Bil-Clip® flashing system, including stamped tabs, 6 inches on center, to be bent inward to hold single ply roofing membrane securely in place.

G. Curb insulation: Shall be rigid, high-density fiberboard of 1 inches thickness on outside of curb.

H. Lifting mechanisms: Manufacturer shall provide compression spring operators enclosed in telescopic tubes to provide, smooth, easy, and controlled cover operation throughout the entire arc of opening and closing. The upper tube shall be the outer tube to prevent accumulation of moisture, grit, and debris inside the lower tube assembly. The lower tube shall interlock with a flanged support shoe.

I. Hardware
   1. Heavy pintle hinges shall be provided
   2. Cover shall be equipped with a spring latch with interior and exterior turn handles
   3. Roof hatch shall be equipped with interior and exterior padlock hasps.
   4. The latch strike shall be a stamped component bolted to the curb assembly.
   5. Cover shall automatically lock in the open position with a rigid hold open arm equipped with a 1” inches diameter red vinyl grip handle to permit easy release for closing.
   6. Compression spring tubes shall be an anti-corrosive composite material and all other hardware shall be zinc plated and chromate sealed.
   7. Cover hardware shall be bolted into heavy gauge channel reinforcing welded to the underside of the cover and concealed within the insulation space.

J. Steel Ladders:
   1. Space siderails 16 inches (406 mm) apart unless otherwise indicated.
   2. Siderails: Continuous, 3/8-by-2-1/2-inch (9.5-by-64-mm) steel flat bars, with eased edges.
   3. Rungs: 3/4-inch- (19-mm-) diameter steel bars.
   4. Fit rungs in centerline of siderails; plug-weld and grind smooth on outer rail faces.
   5. Provide nonslip surfaces on top of each rung.
   6. Finish: As selected by Architect from manufacturers full range.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Verify dimensions of roof openings for roof accessories. Install roof accessories according to manufacturer's written instructions.
   1. Install roof accessories level, plumb, true to line and elevation, and without warping, jogs in alignment, excessive oil canning, buckling, or tool marks.
   2. Anchor roof accessories securely in place so they are capable of resisting indicated loads.
   3. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.
   4. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.

B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
   1. Coat concealed side of uncoated aluminum roof accessories with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
   2. Underlayment: Where installing roof accessories directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet, or install a course of polyethylene sheet.

C. Seal joints with sealant as required by roof accessory manufacturer.

3.2 REPAIR AND CLEANING

A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing according to ASTM A 780.

B. Touch up factory-primed surfaces with compatible primer ready for field painting according to Division 09 painting Sections.

C. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 077200

SECTION 078443 – JOINT FIRESTOPPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Joints in or between fire-resistance-rated constructions.
   2. Joints in smoke barriers.

1.2 DEFINITIONS

A. Firestopping: Material or combination of materials used to retain integrity of fire-rated construction by maintaining an effective barrier against the spread of flame, smoke, and hot gases through penetrations in fire rated wall and floor assemblies.

1.3 GENERAL DESCRIPTION OF THE WORK OF THIS SECTION

A. Only tested and listed firestop systems shall be used in specific locations as follows:

B. Openings between structurally separate sections of wall or floors.

C. Gaps between the top of walls and ceilings or roof assemblies.

D. Expansion joints in walls and floors.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.
   1. Submit Product Data: Manufacturer's specifications and technical data for each material including the composition and limitations, documentation of tested systems to be used and manufacturer's installation instructions to comply Division 01.

B. Product Schedule: For each fire-resistive joint system. Include location and design designation of qualified testing agency.
   1. Where Project conditions require modification to a qualified testing agency's illustration for a particular fire-resistive joint system condition, submit illustration, with modifications marked, approved by fire-resistive joint system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.
   2. Manufacturer's engineering judgment identification number and details when no tested and listed system is available for an application. Engineering judgment shall include both project name and contractor’s name who will install system as described in document.

C. Installer Certificates: From Installer indicating fire-resistive joint systems have been installed in compliance with requirements and manufacturer's written recommendations.

D. Product test reports.

1.5 QUALITY ASSURANCE

A. Installer Qualifications:
   1. Engage an experienced Installer who is certified, licensed, or otherwise qualified by the firestopping manufacturer as having been provided the necessary training to install manufacturer’s products per

specified requirements. A manufacturer's willingness to sell its firestopping products to the Contractor or to an Installer engaged by the Contractor does not in itself confer qualification on the buyer.

2. The work is to be installed by a contractor with at least one of the following qualifications:

   FM 4991 Approved Contractor
   UL Approved Contractor
   Hilti Accredited Fire Stop Specialty Contractor

3. Installer shall have not less than 3 years experience with fire stop installation.

B. A manufacturer's direct representative (not distributor or agent) to be on-site during initial installation of firestop systems to train appropriate contractor personnel in proper selection and installation procedures. This will be done per manufacturer's written recommendations published in their literature and drawing details.

C. Fire-Test-Response Characteristics: Fire-resistive joint systems shall comply with the following requirements:
   1. Fire-resistive joint system tests are performed by a qualified testing agency acceptable to authorities having jurisdiction.
   2. Fire-resistive joint systems are identical to those tested per testing standard referenced in "Fire-Resistive Joint Systems" Article. Provide rated systems complying with the following requirements:
      a. Fire-resistive joint system products bear classification marking of qualified testing agency.
      b. Fire-resistive joint systems correspond to those indicated by reference to designations listed by the following:
         1) UL in its "Fire Resistance Directory."

D. Firestop System installation shall meet requirements of ASTM E 1966 and/or ANSI/UL 2079 tested and listed assemblies that provide fire-resistance ratings not less than that of the construction in which the joint occurs.

E. Proposed firestop materials and methods shall conform to applicable governing codes having local jurisdiction.

F. Firestop Systems do not reestablish the structural integrity of load bearing partitions/assemblies, or support live loads and traffic. Installer shall consult the structural engineer prior to penetrating any load bearing assembly.

G. Preinstallation Conference: Conduct conference at Project site with a manufacturer's direct representative (not distributor or agent) .

H. For those firestop applications that exist for which no tested and listed system is available through a manufacturer, an engineering judgment derived from similar tested system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineering judgment documents shall follow requirements set forth by the International Firestop Council.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials undamaged in manufacturer's clearly labeled, unopened containers, identified with brand, type, and UL or OPL label, where applicable.

B. Coordinate delivery of materials with scheduled installation date to allow minimum storage time at job-site.

C. Store materials under cover and protect from weather and damage in compliance with manufacturer's requirements, including temperature restrictions.

D. Comply with recommended procedures, precautions or remedies described in material safety data sheets as applicable.

E. Do not use damaged or expired materials.

1.7 PROJECT CONDITIONS

A. Do not use materials that contain flammable solvents.

B. Schedule installation of firestopping after completion of penetrating item installation but prior to covering or concealing of openings.

C. Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.

D. Weather conditions: Do not proceed with installation of firestop materials when temperatures exceed the manufacturer's recommended limitations for installation printed on product label and product data sheet

E. During installation, provide masking and drop cloths to prevent firestopping materials from contaminating any adjacent surfaces.

F. Comply with ASTM D 6905 (modified) for resistance to wind driven rain and water.

1.8 COORDINATION

A. Coordinate construction of joints to ensure that fire-resistive joint systems are installed according to specified requirements.

B. Coordinate sizing of joints to accommodate fire-resistive joint systems.

C. Notify Owner's testing agency at least seven days in advance of fire-resistive joint system installations; confirm dates and times on day preceding each series of installations.

PART 2 - PRODUCTS

2.1 JOINT FIRESTOPPING GENERAL

A. Provide firestopping composed of components that are compatible with each other and substrates forming joints under conditions of service and application, as demonstrated by the firestopping manufacturer based on testing and field experience.

B. Provide components for each fire-resistive joint system that are needed to install fill material. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.

2.2 JOINT FIRESTOPPING SYSTEMS

A. Where required, provide fire-resistive joint systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of assemblies in or between which fire-resistive joint systems are installed. Fire-resistive joint systems shall accommodate building movements without impairing their ability to resist the passage of fire and hot gases.

B. Subject to compliance with joint systems (XHBN) listed in Volume II of the UL Fire Resistance Directory or OPL Listed Products Directory; provide products of the following manufacturer as identified below:

a. Basis of Design:
Hilti Inc., Plano, Texas

800-879-8000
www.us.hilti.com

b. 3M

c. Substitution requests shall be considered in accordance with contract provisions.

C. Joints in or between Fire-Resistance-Rated Construction: Ratings determined per ASTM E 1966 or UL 2079:
1. F-Rating: not less than the fire resistance rating of the construction they will join.
2. Firestop Top Track Seal: For metal stud partitions installed on flat concrete slab use one-piece, pre-formed, polyurethane foam based, firestop seal for use with standard head-joint top tracks and bottom-joint tracks, and slip-type head joints in fire-rated construction at top or bottom of partition to maintain continuity of the fire-resistance-rated assembly indicated. Provide in width and configuration required to accommodate depth and installation of studs and designed to saddle-over the top track or under the bottom-track.

D. Joints at Intersection between Rated Wall Assemblies and Nonrated Horizontal Assemblies: Provide joint firestopping systems with ratings determined by ASTM E 2837.

E. Joints in Smoke Barriers: Ratings determined per UL 2079.
1. L-Rating: Not exceeding 5.0 cfm/ft. of joint at both ambient and elevated temperatures.

F. Mold Resistance: Provide penetration firestopping with mold and mildew resistance rating of zero (0) as determined by ASTM G21.

G. Rain and water resistance: provide perimeter joint sealant tested in accordance with ASTM D 6904 with less than 1 hour tack free time as tested in accordance with ASTM C 679.

H. Exposed Fire-Resistive Joint Systems: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

I. Accessories: Provide components of fire-resistive joint systems, including primers and forming materials, that are needed to install fill materials and to maintain ratings required. Use only components specified by fire-resistive joint system manufacturer and approved by the qualified testing agency for systems indicated.

2.3 MATERIALS

A. Use only firestop products that have been tested in accordance with ASTM E 1966 and/or ANSI/UL 2079 for specific rated construction conditions conforming to construction assembly type, movement capability, spacing requirements, and fire-resistance-rating involved for each separate instance.

B. Sealants, sprays, or pre-formed materials for use with fire-rated construction joints and other gaps, the following products are acceptable:
1. Hilti Firestop Top Track Seal (CFS-TTS)
2. Hilti Firestop Top Track Seal for Metal Deck (CFS-TTS MD)
3. Hilti Firestop Joint Spray (CFS-SP WB)
4. Hilti Firestop Silicone Joint Spray (CFS-SP SIL)
5. Hilti Flexible Firestop Sealant (CP 606)
6. Hilti Firestop Silicone Sealant Gun Grade (CFS-S SIL GG)
7. Hilti Firestop Silicone Sealant Self Leveling (CFS-S SIL SL)
8. Hilti bottom of wall sealant CP 605

C. Sealants for use as part of a Perimeter Fire Barrier System between fire-resistance-rated floors and exterior wall assemblies, the following products are acceptable:
1. Hilti Preformed Firestop System (CFS-EOS QuickSeal)
2. Hilti Firestop Joint Spray (CFS-SP WB)
3. Hilti Firestop Silicone Joint Spray (CFS-SP SIL)

4. Hilti Firestop Silicone Sealant Gun Grade (CFS-S SIL GG)

D. Pre-formed mineral wool designed to fit flutes of metal profile deck and gap between top of wall and metal deck profile; use as a backer for spray material.
   1. Hilti CFS TTS MD Plug
   2. Hilti CFS-TTS MD Cover
   3. Hilti Speed Plugs (CP 777)
   4. Hilti Speed Strips (CP 767)

E. Provide a firestop system with an Assembly Rating as determined by ASTM E 1966 and/or ANSI/UL 2079 which is equal to the fire-resistance ratings of the construction in which the joint occurs.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.
   1. Surfaces to which firestop materials will be applied shall be free of dirt, grease, oil, rust, laitance, release agents, water repellents, and any other substances that may affect proper adhesion.
   2. Provide masking and temporary covering to prevent soiling of adjacent surfaces by firestopping materials.
   3. Comply with manufacturer's recommendations for temperature and humidity conditions before, during and after installation of firestopping.
   4. Do not proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning: Clean joints immediately before installing fire-resistive joint systems to comply with fire-resistive joint system manufacturer's written instructions and the following requirements:
   1. Remove from surfaces of joint substrates foreign materials that could interfere with adhesion of fill materials.
   2. Clean joint substrates to produce clean, sound surfaces capable of developing optimum bond with fill materials. Remove loose particles remaining from cleaning operation.
   3. Remove laitance and form-release agents from concrete.

B. Priming: Prime substrates where recommended in writing by fire-resistive joint system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Masking Tape: Use masking tape to prevent fill materials of fire-resistive joint system from contacting adjoining surfaces that will remain exposed on completion of the Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove stains. Remove tape as soon as possible without disturbing fire-resistive joint system's seal with substrates.

3.3 INSTALLATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for joint configurations, substrates, and other conditions affecting performance of the Work.

B. Install fire-resistive joint systems to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.

C. Install forming materials and other accessories of types required to support fill materials during their application and in position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
   1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of fire-resistive joint system.

D. Install fill materials for fire-resistive joint systems by proven techniques to produce the following results:
   1. Fill voids and cavities formed by joints and forming materials as required to achieve fire-resistance ratings indicated.
   2. Apply fill materials so they contact and adhere to substrates formed by joints.
   3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 IDENTIFICATION

A. The firestop contractor is to supply documentation for each single application addressed. This documentation is to identify each penetration and joint location on the entire project.

B. The Documentation Form for Construction Joints is to include:
   1. A Sequential Location Number
   2. The Project Name
   3. Date of Installation
   4. Detailed description of the Construction Joints location
   5. Tested System or Engineered Judgment Number
   6. Type of Construction Joint
   7. The Width of the Joint
   8. The Lineal Footage of the Joint
   9. Number of sides addressed
   10. Hourly rating to be achieved
   11. Installers Name

C. Copies of these documents are to be provided to the general contractor at the completion of the project.

D. A firestop documentation manager software shall be used to document, track, and maintain the passive firestop systems throughout the construction and maintenance phase of the facility. The software solution shall be used to track and document every firestop system installed on the project and each subsequent addition, change, or removal of the firestop system. The firestop documentation shall be managed with a cloud-based software which allows the installer to use a standard smartphone or tablet device (either iOS, Android or Windows capable) to capture the relevant information for the installation. The following data shall be tracked for each penetration within the facility: product installed, system installed, date of installation, location of the penetration including a notation on the 2D plan image, F-rating, name of installer, photo (pre-installation and post-installation), and inspection status. The Owner and/ or Construction Manager may designate additional items to be tracked. The firestop documentation manager software must perform the following basic functions:
   1. Create multiple projects/ facilities, add/create/ remove users for each project, upload documents including UL systems, 2D floor plans, product data, engineering judgments, etc.
   2. Define data to track using pre-defined input fields or creating custom input fields as desired.
   3. Capture multiple photos for each penetration, including a pre-installation and post-installation photo.
   4. Scan QR Code on Hilti identification label to link the program data to a specific penetration location.
   5. Annotate (mark) location of penetration on 2D floor plan.
   6. Create reports by filtering data and utilizing report templates.
   7. Online/ offline (for use in areas where data service is unavailable) synchronization of data between mobile device, online application and cloud-based system.
   8. Ability to transfer ownership of projects from one customer to another from construction phase to facility maintenance.

E. Permanently attach Hilti identification labels to surfaces adjacent to and within 6 inches (150 mm) of firestopping edge so labels will be visible to anyone seeking to remove or change penetrating items or firestopping. Labels shall

have a unique QR code for each penetration which can be scanned by the firestop documentation software to quickly identify the penetration attributes.

1. Single Source: Obtain firestop documentation manager software and firestop systems for each type of penetration and construction condition indicated only from a single manufacturer.

3.5 FIELD QUALITY CONTROL

A. Examine sealed joints to ensure proper installation before concealing or enclosing areas.

B. Keep areas of work accessible until inspection by applicable code authorities and/or independent inspection agency.

C. Perform under this section patching and repairing of firestopping caused by cutting or penetrating of existing firestop systems already installed by other trades.

D. Manufacturer's Field Services: Contractor to ensure a manufacturer's direct representative is on-site during initial installation of firestop systems to train appropriate contractor personnel in proper selection and installation procedures. Training will be done per manufacturer's written recommendations published in their literature and drawing details. During installation, contractor shall have manufacturer's representative provide periodic visual observations and written documentation of the results. Contact Hilti for support at 800.879.8000.

3.6 CLEANING AND PROTECTING

A. Clean off excess fill materials adjacent to joints as Work progresses by methods and with cleaning materials that are approved in writing by fire-resistive joint system manufacturers and that do not damage materials in which openings occur.

B. Provide final protection and maintain conditions during and after installation that ensure fire-resistive joint systems are without damage or deterioration at time of Substantial Completion. If damage or deterioration occurs despite such protection, cut out and remove damaged or deteriorated fire-resistive joint systems immediately and install new

3.7 FIRE-RESISTIVE JOINT SYSTEM SCHEDULE

A. Refer to Schedule at end of this Section.

END OF SECTION 078443

Schedule of joint firestop systems. Basis of Design: Hilti, Inc.

JOINT TYPE	F-RATING (HR)	BASIS OF DESIGN UL SYSTEM	
		JOINT WIDTH LESS THAN OR EQUAL TO 2"	JOINT WIDTH GREATER THAN 2", LESS THAN OR EQUAL TO 6" [4]
CONCRETE OR BLOCK WALL TO FLAT CONCRETE FLOOR (**TOP-OF-WALL**)	1	N/A**	N/A**
	2	HW-D-0097[1]	HW-D-1009
	3	HW-D-1008[1], HW-D 0268	HW-D-1008
GYPSUM WALL TO FLAT CONCRETE FLOOR (**TOP-OF-WALL**)	1 & 2	HW-D-0757, HW-D-0082, HW-D-0083, HW-D-0106, HW-D-0119	HW-D-1011, HW-D-1012, HW-1020
	3	HW-D-0119	
GYPSUM SHAFT WALL TO **TOP-OF-WALL**	2	HW-D-0824, HW-D-0342, HW-D-0750	N/A**
GYPSUM SHAFT WALL TO CONCRETE FLOOR (**BOTTOM-OF-WALL**)	1	BW-S-0023	N/A**
	2	BW-S-0023	
GYPSUM WALL TO CONCRETE FLOOR (**BOTTOM-OF-WALL**)	1 & 2	BW-S-0002	N/A**
CONCRETE (**WALL TO WALL**)	2	WW-D-0017, WW-D-0082	WW-D-1080, WW-D-1084
	3	WW-D-1011[1], WW-D-0032	WW-D-1011
GYPSUM TO CONCRETE (**WALL TO WALL**)	1 & 2	WW-S-0074, WW-D-0040	N/A**

* SEE NOTE 3

** CONTACT HILTI FOR CURRENT UL-CLASSIFIED SYSTEM OR ENGINEER JUDGMENT DRAWING: 800-879-8000

NOTES:

1. CLASSIFIED SYSTEMS FOR 2" - 6" WIDE JOINTS MAY BE USED FOR JOINTS 2" WIDE AND LESS.
2. CONFIRM THAT MOVEMENT CAPABILITIES OF THE SELECTED UL SYSTEM MEETS OR EXCEEDS THE SPECIFIED MOVEMENT RANGE OF THE PARTICULAR JOINT.
3. SYSTEMS MARKED WITH ASTERIK (*) ARE SUITABLE FOR TOP-OF-WALL JOINTS WHERE THE FLUTED METAL DECK HAS SPRAY-ON MONOKOTE MK-6/HY FIREPROOFING.
4. VERIFY ALLOWABLE JOINT WIDTH ON SPECIFIC UL SYSTEM DRAWING.

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes joint sealants for the following applications, including those specified by reference to this Section:
   1. Exterior joints in the following vertical surfaces and horizontal nontraffic surfaces:
   2. Exterior joints in the following horizontal traffic surfaces:
   3. Interior joints in the following vertical surfaces and horizontal nontraffic surfaces:
   4. Interior joints in the following horizontal traffic surfaces:

B. Related Sections include the following:
   1. Division 07 Section "Joint Firestopping" for sealing joints in fire-resistance-rated construction.
   2. Division 08 Section "Glazing" for glazing sealants.
   3. Division 09 Section "Gypsum Board" for sealing perimeter joints of gypsum board partitions to reduce sound transmission.
   4. Division 09 Section "Tiling" for sealing tile joints.

1.2 PERFORMANCE REQUIREMENTS

A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

B. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

1.3 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

C. Samples for Verification: For each type and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- wide joints formed between two 6-inch- long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

D. Product Certificates: For each type of joint sealant and accessory, signed by product manufacturer.

E. SWRI Validation Certificate: For each elastomeric sealant specified to be validated by SWRI's Sealant Validation Program.

F. Qualification Data: For Installer.

G. Preconstruction Field Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on preconstruction testing specified in "Quality Assurance" Article.

H. Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:
   1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
   2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

I. Field Test Report Log: For each elastomeric sealant application.

J. Product Test Reports: Based on comprehensive testing of product formulations performed by a qualified testing agency, indicating that sealants comply with requirements.

K. Warranties: Special warranties specified in this Section.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized Installer who is approved or licensed for installation of elastomeric sealants required for this Project.

B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

C. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
1. Use manufacturer's standard test method to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
2. Submit not fewer than eight pieces of each type of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
5. Testing will not be required if joint-sealant manufacturers submit joint preparation data that are based on previous testing of current sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.

D. Product Testing: Obtain test results for "Product Test Reports" Paragraph in "Submittals" Article from a qualified testing agency based on testing current sealant formulations within a 36-month period preceding the Notice to Proceed with] [commencement of the Work.
1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated, as documented according to ASTM E 548.
2. Test elastomeric joint sealants for compliance with requirements specified by reference to ASTM C 920, and where applicable, to other standard test methods.
3. Test elastomeric joint sealants according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C 920 for adhesion and cohesion under cyclic movement, adhesion-in-peel, and indentation hardness.
4. Test other joint sealants for compliance with requirements indicated by referencing standard specifications and test methods.

E. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to Project joint substrates as follows:
1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
2. Conduct field tests for each application indicated below:
   a. Each type of elastomeric sealant and joint substrate indicated.
   b. Each type of nonelastomeric sealant and joint substrate indicated.
3. Notify Architect seven days in advance of dates and times when test joints will be erected.
4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.
   a. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193.
      1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

5. Report whether sealant in joint connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
6. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

F. Mockups: Build mockups incorporating sealant joints, as follows, to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution:
1. Joints in mockups of assemblies specified in other Sections that are indicated to receive elastomeric joint sealants, which are specified by reference to this Section.

G. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1.5 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:
1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.6 WARRANTY

A. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
1. Warranty Period: Two years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer's standard form in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
1. Warranty Period: Five years from date of Substantial Completion.

C. Special warranties specified in this Article exclude deterioration or failure of elastomeric joint sealants from the following:
1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.
2. Disintegration of joint substrates from natural causes exceeding design specifications.
3. Mechanical damage caused by individuals, tools, or other outside agents.
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in other Part 2 articles.

2.2 MATERIALS, GENERAL

A. Refer to Division 01 Section “Sustainability Design Requirements” for VOC limits for paints and coatings installed within the weather barrier.

B. Compatibility: Provide joint sealants and accessory materials that are compatible with one another, and with materials in close proximity under use conditions, as demonstrated by sealant manufacturer using ASTM C1087 testing and related experience.

C. Joint Sealant Standard: Comply with ASTM C 920 and other specified requirements for each liquid-applied joint sealant.

D. Stain Test Characteristics: Where sealants are required to be nonstaining, provide sealants tested per ASTM C 1248 as non-staining on porous joint substrates indicated for Project.

E. Food Contact Suitability: Where sealants are required to be suitable for contact with food provide sealants complying with 21 CFR 177.2600.

F. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.

G. Colors of Exposed Joint Sealants: Custom colors, match Architect’s samples.

2.3 ELASTOMERIC JOINT SEALANTS GENERAL

A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

B. Stain-Test-Response Characteristics: Where elastomeric sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

C. Suitability for Immersion in Liquids. Where elastomeric sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C 1247 and qualify for the length of exposure indicated by reference to ASTM C 920 for Class 1 or 2. Liquid used for testing sealants is deionized water, unless otherwise indicated.

2.4 WEATHERPROOFING SILICONE SEALANTS AND ADHESIVES

A. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 50, for Use NT; SWRI validation.
   1. Acceptable Products:
      a. Basis of Design Product: DOWSIL™ 756 SMS Building Sealant.
      b. SilPruf NB SCS9000 Silicone Sealant as manufactured by Momentive Performance Materials, Inc.
      c. or approved equal.
   2. Application: Field or factory applied as required, weatherproofing porous stone, metal panels, curtain wall framing, and other above-grade expansion and control joints
   3. Color: As selected to match adjacent materials.

B. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 50, for Use NT, G, A and O; SWRI validation.
   1. Acceptable Products:
      a. Basis of Design Product: DOWSIL™ 795 Building Sealant.

b. SilPruf NB SCS9000 Silicone Sealant as manufactured by Momentive Performance Materials, Inc.
c. or approved equal.

2. Application: Structural and non-structural glazing, structural attachment for panel systems, as well as above-grade weathersealing joints
3. Color: As selected to match adjacent materials.

C. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, for Use T, NT; SWRI validation.

1. Acceptable Products:
   a. Basis of Design Product: DOWSIL™ 790 Silicone Building Sealant.
   b. SilPruf LM SCS2700 Silicone Sealant as manufactured by Momentive Performance Materials, Inc.
   c. or approved equal.
2. Application: Above-grade high movement expansion and control joints of most building materials and for both new and remedial construction.
3. Color: As selected to match adjacent materials.

D. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 50, for Use NT; SWRI validation.

1. Acceptable Products:
   a. Basis of Design Product: DOWSIL™ 995 Silicone Building Sealant.
   b. SilPruf SCS2000 Silicone Sealant as manufactured by Momentive Performance Materials Inc.
   c. or approved equal.
2. Application: Ideal for use as a glazing sealant in high-performance protective window systems that increase personal safety from flying glass
3. Color: As selected to match adjacent materials.

E. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use NT; SWRI validation.

1. Basis of Design Product: DOWSIL™ 758 Silicone Building Sealant.
2. Application: above-grade weathersealing joints with compatibility and strong adhesion to a wide array of common construction materials, including peel-and-stick window flashings, building wraps, polyolefins, and PVCs
3. Color: not applicable

F. Silicone Elastomeric Coating: Single-component, fluid-applied, water-based, pigmented silicone elastomer.

1. Basis of Design Product: DOWSIL™ AllGuard Silicone Elastomeric Coating.
2. Application: above-grade application to cast concrete, precast concrete, clay brick masonry, concrete unit masonry, synthetic stucco, exterior insulation and finish systems (EIFS), cement plaster (stucco).
3. Color: As selected to match adjacent materials.

G. Preformed Silicone Elastomer Extrusion: Highly flexible low-modulus flashing and transition material for bonding to substrates with silicone sealant. SWRI validation.

1. Acceptable Products:
   a. Basis of Design Product: DOWSIL™ 123 Silicone Seal.
   b. UltraSpan US1100 Pre-cured Silicone Weatherstrip as manufactured by Momentive Performance Materials, Inc.
   c. or approved equal.
2. Application: used for flashing and transitions in new construction and as a joint overlay in joint sealant rehabilitation work
3. Color: As selected to match adjacent materials.

H. Silicone Elastomer Weather Barrier Transitions: Highly flexible clear flashing and transition sheet and pre-molded corners for bonding with silicone sealant to weather barrier substrates and to adjacent curtain wall, storefront, and window frames and other transition substrates.
   1. Acceptable Products:
      a. Basis of Design Product: DOWSIL™ Silicone Transition Strip (STS).
      b. UltraSpan UST2200 Silicone Transition Strip as manufactured by Momentive Performance Materials, Inc.
      c. or approved equal.
   2. Bonding Sealant: Manufacturer's recommended neutral-curing silicone.
   3. Application: . Interface between a variety of air/vapor barrier materials and window, storefront, and curtainwall opening frames (to be sued with DOWSIL 758, 791 or 795)
   4. Color: As selected to match adjacent materials.

I. One part, paintable acrylic polymer sealant, ASTM C 834, Type O, Grade NF
   1. Acceptable Products:
      a. Pecora AC-20+ Siliconized Acrylic Sealant.
      b. RCS20 Siliconized Acrylic Sealant as manufactured by Momentive Performance Materials, Inc.
      c. or approved equal.
   2. Application: Field apply as required.
   3. Color: As selected to match adjacent materials.

2.5 INTERIOR SEALANTS

A. Mildew-Resistant, Single-Component, Nonsag, Acid-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use NT.
   1. Acceptable Products:
      a. Basis of Design Product: DOWSIL™ 786 Silicone Sealant.
      b. Sanitary SCS1700 Silicone Sealant as manufactured by Momentive Performance Materials, Inc.
      c. or approved equal.
   2. NSF Standard 51 and FDA Regulation No. 21 CFR 177.2600 compliant.
   3. Application: Mildew resistant when cured and is suitable for sealing tubs, showers, sinks, porcelain, cultured marble, glass, painted areas, and other nonporous surfaces and plumbing fixtures
   4. Color: As selected to match adjacent materials.

2.6 STRUCTURAL GLAZING ADHESIVES/SEALANTS

A. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 50, for Use NT; SWRI validation.
   1. Acceptable Products:
      a. Basis of Design Product: DOWSIL™ 995 Silicone Building Sealant.
      b. SilPruf SCS2000 Silicone Sealant as manufactured by Momentive Performance Materials Inc.
      c. or approved equal.
   2. Application: Ideal for use as a glazing sealant in high-performance protective window systems that increase personal safety from flying glass
   3. Color: As selected to match adjacent materials.

2.7 GENERAL GLAZING SEALANTS

A. One-component, neutral-cure, medium-modulus, fast cure, fast green strength, 100 percent silicone polymer sealant.
   1. Acceptable Product:
      a. Basis of Design Product: DOWSIL™ 1199 Silicone Building Sealant.

b. SilGlaze II SCS2800 Silicone Sealant as manufactured by Momentive Performance Materials, inc.
c. or approved equal.

2. Application: Automated glazing systems.
3. Color: As selected to match adjacent materials.

B. One part, Nonsag, Urethane Joint Sealants. ASTM C920, Type S, Grade NS, Class 25, for Use NT
1. Acceptable Products:
a. Sika Corporation: Sikaflex – 1a;
b. BASF Building Systems: Sonolastic NP1
c. or approved equal.
2. Application: Field apply as required.
3. Color: As selected to match adjacent materials.

C. One part, Pourable, Traffic-Grade, Urethane Joint Sealants. ASTM C920, Type S, Grade P, Class 25, for Use T
1. Acceptable Products:
a. Sika Corporation: Sikaflex – 1CSL;
b. BASF Building Systems: Sonolastic SL1
c. or approved equal.
2. Application: Field apply as required.
3. Color: As selected to match adjacent materials.

D. Multi-Component, Nonsag, Traffic-Grade, Urethane Joint Sealants. ASTM C920, Type M, Grade NS, Class 25, for Use T
1. Acceptable Products:
a. Sika Corporation: Sikaflex – 2C;
b. BASF Building Systems: Sonolastic NP2
c. or approved equal.
2. Application: Field apply as required.
3. Color: As selected to match adjacent materials.

2.8 ACOUSTICAL JOINT SEALANTS

A. Acoustical Joint Sealant: Manufacturer's standard non-hardening, nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
1. Basis of Design: Subject to project requirements, provide the following products or approved equals:
a. Pecora AIS-919
b. Pecora AC-20 FTR (Fire rated locations)
2. Putty Pads: At electrical boxes in sound-rated partitions, provide Hilti CP 617 or approved equal.

2.9 ACCESSORIES

A. Primer:
1. DOWSIL 1200 OS, P5200, Primer C, Primer P.
2. Momentive Performance Materials, Inc. SS4179P, SS4044P, SS4004P (tinted) or SCP3195P primer(s) as recommended by manufacturer and required by application.

B. Backer Rod for Weather Sealing Applications:
1. Material: Non-gassing polyethylene or flexible polyurethane foam rod.
2. Stucco and Porous Surface Applications: Non-gassing polyethylene, non-gassing polyolefin or flexible polyurethane foam rod.

3. Width: 25 to 50 percent greater than width of joint to extend continuous pressure against joint walls.
4. Material shall expand and contract with bead movement without pushing sealant out of joint during compression cycle.
5. Do not use solid rubber backup materials, unless tested for compatibility with sealants and approved by Architect.

C. Backer Rod for Glazing Applications:
1. Material: Non-gassing polyethylene, Non-Gassing polyolefin or flexible polyurethane foam rod.
2. Porous Surface Applications: Non-gassing polyethylene, non-gassing polyolefin or flexible polyurethane foam rod.
3. Width: 25 to 50 perfect greater than width of joint to extend continuous pressure against joint walls.
4. Material shall expand and contract with bead movement without pushing sealant out of joint during compression cycle.
5. Do not use solid rubber backup materials, unless tested for compatibility with sealant and approved by Architect.

D. Bond Breaker Tape: Polyethylene tape, approved by manufacturer.

2.10 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

a. Concrete.
b. Masonry.
c. Unglazed surfaces of ceramic tile.

3. Remove laitance and form-release agents from concrete.
4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
   a. Metal.
   b. Glass.
   c. Porcelain enamel.
   d. Glazed surfaces of ceramic tile.

B. Joint Priming: Prime joint substrates, where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Acoustical Sealant Installation: At sound-rated assemblies and elsewhere as indicated, seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations.

D. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

E. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

F. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

G. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
1. Remove excess sealant from surfaces adjacent to joints.

2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
4. Provide flush joint configuration where indicated per Figure 5B in ASTM C 1193.
5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 5C in ASTM C 1193.
    a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

H. Installation of Preformed Tapes: Install according to manufacturer's written instructions.

I. Installation of Preformed Silicone-Sealant System: Comply with the following requirements:
1. Apply masking tape to each side of joint, outside of area to be covered by sealant system.
2. Apply silicone sealant to each side of joint to produce a bead of size complying with preformed silicone-sealant system manufacturer's written instructions and covering a bonding area of not less than 3/8 inch. Hold edge of sealant bead 1/4 inch inside masking tape.
3. Within 10 minutes of sealant application, press silicone extrusion into sealant to wet extrusion and substrate. Use a roller to apply consistent pressure and ensure uniform contact between sealant and both extrusion and substrate.
4. Complete installation of sealant system in horizontal joints before installing in vertical joints. Lap vertical joints over horizontal joints. At ends of joints, cut silicone extrusion with a razor knife.

J. Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, producing seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures where expansion of sealant requires acceleration to produce seal, apply heat to sealant in compliance with sealant manufacturer's written instructions.

3.4 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
1. Extent of Testing: Test completed elastomeric sealant joints as follows:
    a. Perform 1 test for each 1000 feet of joint length thereafter or 1 test per each floor per elevation.
2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab in Appendix X1 in ASTM C 1193, as appropriate for type of joint-sealant application indicated.
    a. For joints with dissimilar substrates, verify adhesion to each substrate separately; do this by extending cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
3. Inspect joints for complete fill, for absence of voids, and for joint configuration complying with specified requirements. Record results in a field-adhesion-test log.
4. Inspect tested joints and report on the following:
    a. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. Compare these results to determine if adhesion passes sealant manufacturer's field-adhesion hand-pull test criteria.
    b. Whether sealants filled joint cavities and are free of voids.
    c. Whether sealant dimensions and configurations comply with specified requirements.
5. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.
6. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

B. Evaluation of Field Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.5 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.7 JOINT-SEALANT SCHEDULE

A. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces.
   1. Joint Locations:
      a. Control and expansion joints in brick pavers.
      b. Isolation and contraction joints in cast-in-place concrete slabs.
      c. Joints between plant-precast architectural concrete paving units.
      d. Joints in stone paving units, including steps.
      e. Tile control and expansion joints.
      f. Joints between different materials listed above.
      g. Other joints as indicated on Drawings.
   2. Joint Sealant: Urethane.

B. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces subject to water immersion.
   1. Joint Sealant: Polysulfide

C. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.
   1. Joint Locations:
      a. Construction joints in cast-in-place concrete.
      b. Joints between plant-precast architectural concrete units.
      c. Control and expansion joints in unit masonry.
      d. Joints in dimension stone cladding.
      e. Other joints as indicated on Drawings.
   2. Joint Sealant: Silicone, nonstaining.

D. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.
   1. Joint Locations:
      a. Isolation joints in cast-in-place concrete slabs.
      b. Control and expansion joints in stone flooring.
      c. Control and expansion joints in brick flooring.
      d. Control and expansion joints in tile flooring.
      e. Other joints as indicated on Drawings.
   2. Joint Sealant: Urethane.

E. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces.
   1. Joint Locations:
      a. Control and expansion joints on exposed interior surfaces of exterior walls.

b. Tile control and expansion joints.
c. Vertical joints on exposed surfaces of masonry.
d. Joints on underside of plant-precast structural concrete.
e. Other joints as indicated on Drawings.

2. Joint Sealant: Urethane.

F. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces not subject to significant movement.

1. Joint Locations:
   a. Control joints on exposed interior surfaces of exterior walls.
   b. Perimeter joints between interior wall surfaces and frames of interior doors windows and elevator entrances.
   c. Other joints as indicated on Drawings.
2. Joint Sealant: Silicone

G. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces.

1. Joint Locations:
   a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
   b. Tile control and expansion joints where indicated.
   c. Other joints as indicated on Drawings.
2. Joint Sealant: Silicone, mildew resistant, acid curing.

H. Joint Sealant Application: Interior acoustic at all joints between units, around electrical boxes and other penetrations.

I. Joint-Sealant Application: Concealed mastics.

1. Joint Locations:
   a. Aluminum thresholds.
   b. Sill plates.
   c. Other joints as indicated on Drawings.
2. Joint Sealant: Urethane.

3.8 JOINT-SEALANT COLORS SCHEDULE

A. Natural CMU to CMU: Sealant color shall match mortar (when CMU is not painted)

B. Painted CMU to CMU: Sealant color shall match paint color.

C. CMU to Gypsum Board: Sealant color shall match paint color.

D. Casework to wall: Sealant color to match casework.

E. Plumbing fixture to Countertops: Clear sealant

F. Window to painted wall: Sealant color shall match paint color.

G. Door frame to painted wall: Sealant color shall match paint color.

H. Window to Masonry: Sealant color shall match mortar (when CMU is not painted).

I. Door frame to Masonry: Sealant color shall match mortar (when CMU is not painted).

J. Wall mounted devices: Sealant color shall match paint color.

K. Wood to other material: Clear sealant, paintable sealant, or color as selected by architect.

L. Masonry control joint: Sealant color shall match color of adjacent mortar.

M. Consult with Architect for specific or unusual locations.

N. Metal Siding: Paintable sealant, or color as selected by architect.

O. Dissimilar Materials: Paintable sealant, or color as selected by architect.

P. Other; Paintable sealant, or color as selected by architect

END OF SECTION 079200

SECTION 081113 – HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes standard hollow metal doors and frames.

1.2 SUBMITTALS

A. Sustainability Submittals:
   1. Submit product-specific or industry-wide Type III Environmental Product Declaration (EPD) that conforms to ISO 14025, 14040, 14044, and EN 15804 or ISO 21930.
   2. Submit Health Product Declaration (HPD) demonstrating the chemical inventory of the product to at least 0.1% (1000 ppm).

B. Product Data: For each type of product indicated.

C. Shop Drawings: Include elevations, door edge details, frame profiles, metal thicknesses, preparations for hardware, and other details.

D. Samples for Initial Selection: For units with factory-applied color finishes.

E. Samples for Verification: For each type of exposed finish required.

F. Schedule: Prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings.

1.3 QUALITY ASSURANCE

A. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.
   1. Temperature-Rise Limit: At vertical exit enclosures and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F above ambient after 30 minutes of standard fire-test exposure.
   2. Smoke- and Draft-Control Assemblies: Provide an assembly with gaskets listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.

B. Fire-Rated, Borrowed-Light Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257 or UL 9. Label each individual glazed lite.

C. Smoke-Control Door Assemblies: Comply with NFPA 105 or UL 1784.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, the following:
   1. Ceco Door Products; an Assa Abloy Group company.
   2. Curries Company; an Assa Abloy Group company.
   3. Fleming Door Products Ltd.; an Assa Abloy Group company.
   4. Steelcraft; an Ingersoll-Rand company.

B. Preference shall be given to products/materials that have a product-specific Type III Environmental Product Declaration (EPD).

C. Preference shall be given to products that have a Health Product Declaration (HPD)

2.2 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, CS, Type B; suitable for exposed applications.

B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, CS, Type B.

C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum A40 metallic coating.

D. Aluminum Framing: ASTM B 221, Alloy 6063-T5 or alloy and temper required to suit structural and finish requirements, not less than 0.062 inch thick.

E. Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), 40Z coating designation; mill phosphatized.
   1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.

F. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

G. Grout: ASTM C 476, except with a maximum slump of 4 inches, as measured according to ASTM C 143/C 143M.

H. Mineral-Fiber Insulation: ASTM C 665, Type I.

I. Glazing: Division 08 Section "Glazing."

J. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat.

2.3 STANDARD HOLLOW METAL DOORS

A. General: Comply with ANSI/SDI A250.8.
   1. Design: Flush panel.
   2. Core Construction: Manufacturer's standard polyurethane, and vertical steel-stiffener core.
      a. Fire Door Core: As required to provide fire-protection and temperature-rise ratings indicated.

b. Thermal-Rated (Insulated) Doors: R-value of not less than 6.0 deg F x h x sq. ft./Btu when tested according to ASTM C 1363.

3. Vertical Edges for Single-Acting Doors: Square edge.
4. Top and Bottom Edges: Closed with flush or inverted 0.042-inch- thick, end closures or channels of same material as face sheets.
5. Tolerances: SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."

B. Exterior Doors: Face sheets fabricated from metallic-coated steel sheet. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:
1. Level 4 (0.067 inches,14 gage) and Physical Performance Level A, Model 1 (Full Flush).

C. Interior Doors: Face sheets fabricated from cold-rolled steel sheet. Provide doors complying with requirements indicated below by referencing SDI A250.8 for level and model and SDI A250.4 for physical performance level:
1. Level 3 (0.053 inches, 16 gage) and Physical Performance Level B, Model 1 (Full Flush).

D. Hardware Reinforcement: ANSI/SDI A250.6.

E. Fabricate concealed stiffeners and hardware reinforcement from either cold- or hot-rolled steel sheet.

2.4 STANDARD HOLLOW METAL FRAMES

A. General: Comply with ANSI/SDI A250.8.

B. Interior Frames: Fabricated from cold-rolled steel sheet.
1. Fabricate frames as fully welded refer to schedule for location.
2. Frames for Level 2 Steel Doors: 0.053-inch- thick steel sheet.
3. Frames for Wood Doors: 0.053-inch-thick steel sheet.

C. Exterior Frames: Fabricated from metallic-coated steel sheet.
1. Fabricate frames with mitered.
2. Frames Steel Doors: 0.067-inch- thick steel sheet.
3. Frames for Wood Doors: 0.067-inch- thick steel sheet.

D. Hardware Reinforcement: ANSI/SDI A250.6.

2.5 FRAME ANCHORS

A. Jamb Anchors:
1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.
3. Compression Type for Drywall Slip-on Frames: Adjustable compression anchors.
4. Postinstalled Expansion Type for Masonry: Minimum 3/8-inch- diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.

B. Floor Anchors: Formed from same material as frames, not less than 0.042 inch thick, and as follows:
1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.

2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch height adjustment. Terminate bottom of frames at finish floor surface.

2.6 HOLLOW METAL PANELS

A. Provide hollow metal panels of same materials, construction, and finish as specified for adjoining hollow metal work.

2.7 STOPS AND MOLDINGS

A. Moldings for Glazed Lites in Doors: Minimum 0.032 inch thick, same material as door face sheet.

B. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch high unless otherwise indicated.

C. Loose Stops for Glazed Lites in Frames: Minimum 0.032 inch thick, same material as frames.

D. Terminated Stops: Where indicated, terminate stops 6 inches above finish floor with a 90-degree angle cut, and close open end of stop with steel sheet closure. Cover opening in extension of frame with welded-steel filler plate, with welds ground smooth and flush with frame.

2.8 ACCESSORIES

A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.

B. Ceiling Struts: Minimum 1/4-inch-thick by 1-inch- wide steel.

C. Grout Guards: Formed from same material as frames, not less than 0.016 inch thick.

D. Glazing, refer to Division 08 Section “Glazing”

2.9 FABRICATION

A. Tolerances: Fabricate hollow metal work to tolerances indicated in SDI 117.

B. Hollow Metal Doors:
1. Exterior Doors: Provide weep-hole openings in bottom of exterior doors. Seal joints in top edges of doors against water penetration.
2. Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated.

C. Hollow Metal Frames: Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
1. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
3. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
4. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
5. Jamb Anchors: Provide number and spacing of anchors as follows:

a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
   1) Two anchors per jamb up to 60 inches high.
   2) Three anchors per jamb from 60 to 90 inches high.
   3) Four anchors per jamb from 90 to 120 inches high.
   4) Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.

b. Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
   1) Three anchors per jamb up to 60 inches high.
   2) Four anchors per jamb from 60 to 90 inches high.
   3) Five anchors per jamb from 90 to 96 inches high.
   4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
   5) Two anchors per head for frames more than 42 inches wide and mounted in metal-stud partitions.

c. Compression Type: Not less than two anchors in each jamb.

d. Postinstalled Expansion Type: Locate anchors not more than 6 inches from top and bottom of frame. Space anchors not more than 26 inches o.c.

6. Door Silencers: Except on weather-stripped doors, drill stops to receive door silencers.
   a. Single-Door Frames: Three door silencers.
   b. Double-Door Frames: Two door silencers.

D. Hardware Preparation: Factory prepare hollow metal work to receive templated mortised hardware according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."
1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
2. Reinforce doors and frames to receive nontemplated, mortised and surface-mounted door hardware.
3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 electrical Sections.

E. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints.
1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow metal work.
2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
3. Provide fixed frame moldings on outside of exterior doors and frames.
4. Provide loose stops and moldings on inside of hollow metal work.
5. Coordinate rabbet width between fixed and removable stops with type of glazing and type of installation indicated.

2.10 STEEL FINISHES

A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
1. Shop Primer: SDI A250.10.

B. Field Paint, refer to Division 09 Painting Sections.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Hollow Metal Frames: Comply with ANSI/SDI A250.11.
   1. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
      a. At fire-protection-rated openings, install frames according to NFPA 80.
      b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
      c. Install frames with removable glazing stops located on secure side of opening.
      d. Install door silencers in frames before grouting.
      e. Remove temporary braces necessary for installation only after frames have been properly set and secured.
      f. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
      g. Field apply bituminous coating to backs of frames that are filled with grout containing antifreezing agents.
   2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
      a. Floor anchors may be set with powder-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
   3. In-Place Gypsum Board Partitions: Secure frames in place with postinstalled expansion anchors through floor anchors at each jamb. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
   4. Ceiling Struts: Extend struts vertically from top of frame at each jamb to overhead structural supports or substrates above frame unless frame is anchored to masonry or to other structural support at each jamb. Bend top of struts to provide flush contact for securing to supporting construction. Provide adjustable wedged or bolted anchorage to frame jamb members.
   5. Installation Tolerances: Adjust hollow metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
      a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
      b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
      c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
      d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

B. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.
   1. Non-Fire-Rated Standard Steel Doors:
      a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
      b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
      c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
      d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.
   2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
   3. Smoke-Control Doors: Install doors according to NFPA 105.

C. Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.

1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.

3.2 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.

B. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

END OF SECTION 081113

SECTION 081416 - FLUSH DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Solid-core doors with wood-veneer faces.
2. Solid core doors with painted faces.
3. Factory finishing flush wood doors.
4. Factory fitting flush wood doors to frames and factory machining for hardware.

1.2 SUBMITTALS

A. Product Data: For each type of door indicated. Include factory-finishing specifications.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; location and extent of hardware blocking; and other pertinent data.
1. Indicate dimensions and locations of mortises and holes for hardware.
2. Indicate dimensions and locations of cutouts.
3. Indicate requirements for veneer matching.
4. Indicate doors to be factory finished and finish requirements.
5. Indicate fire-protection ratings for fire-rated doors.

C. Samples: Represent typical range of color and grain for each species of veneer and solid lumber required.

D. Finish Sample with same materials proposed for factory-finished doors.

1.3 QUALITY ASSURANCE

A. Quality Standard: In addition to requirements specified, comply with WDMA I.S.1-A, "Architectural Wood Flush Doors."

B. Fire-Rated Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at as close to neutral pressure as possible according to NFPA 252.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers-Subject to compliance with requirements, provide products as manufactured by one of the following:
1. Algoma Hardwoods, Inc
2. Eggers Industries
3. VT Industries, INc
4. Marlite
5. Mohawk Doors, a Masonite Company

2.2 DOOR CONSTRUCTION, GENERAL

A. Quality Standard: In addition to requirements specified, comply with WDMA I.S.1-A-11, "Architectural Wood Flush Doors."
1. Heavy Duty unless otherwise indicated.
2. Extra Heavy Duty: Janitor's closets.

B. Fire-Rated Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.

C. Acoustic Rated Doors:
1. Provide core indicated or special construction core as required to meet STC rating indicated on door schedule. All STC ratings must be tested as operable.
2. Provide gasketing and mortise door bottom as required to meet manufacturers tested acoustic rating.
3. Hollow metal frames shall be fully grouted or packed with mineral wool where acoustic rated wood doors are installed.
4. The Sound Transmission Class (STC) specified shall be certified by the manufacturer to be based on tests conducted at an independent testing agency in accordance with ASTM E90-90 and E413-87.

D. Particleboard-Core Doors:
1. Particleboard: ANSI A208.1, Grade LD-1 or Grade LD-2, made with binder containing no urea-formaldehyde resin.
2. Blocking: Provide wood blocking in particleboard-core doors as needed to eliminate through-bolting hardware.

E. Door Types: Refer to Drawings.

2.3 DOORS FOR TRANSPARENT FINISH

A. Interior Wood Veneer Doors:
1. Thickness: 1 ¾ inches.
2. Grade: Premium, with Grade A faces.
3. Species/Veneer: White-Birch
4. Cut: Plain sliced.
5. Match between Veneer Leaves: Book and running match.
6. Core: Wood-based Particleboard
7. Construction: Five plies. Stiles and rails are bonded to core, then entire unit abrasive planed before veneering.
8. Fire Rated: 20 minute unless indicated otherwise.
9. Finish: Prefinished

2.4 DOORS FOR PAINT FINISH

A. Interior Unit Doors:
1. Thickness: 1-3/8 inches
2. Hardboard core.
3. Single panel.
4. Prep for paint finish.

2.5 FABRICATION

A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
   1. Comply with requirements in NFPA 80 for fire-rated doors.

B. Factory machine doors for hardware that is not surface applied.

C. Prehung Doors: Provide doors complete with frames, and hardware.

D. Bifold, Bypass And Pocket Doors
   1. Bifold Doors shall match panel, sticking, profile and design of doors indicated.
   2. All doors shall have hardwood wedge in the top rail of all door panels for improved screw holding and hardware attachment.
   3. Bifold Hardware: Manufacturer and Type: L.E. Johnson Products, Inc. Series 111FD folding door hardware set including track, hangers, hinges, pivots, knobs, brackets, screws and all other accessory items.

2.6 SHOP PRIMING

A. Doors for Opaque Finish: Shop prime faces, all four edges, edges of cutouts, and mortises with one coat of wood primer specified in Division 09 Section “Interior Painting."

2.7 FACTORY FINISHING

A. General: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
   1. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on top and bottom edges, edges of cutouts, and mortises.

B. Factory finish doors that are indicated to receive transparent finish.

C. Transparent Finish: Match architects sample.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Hardware: For installation, see Division 08 Section "Door Hardware."

B. Installation Instructions: Install doors to comply with manufacturer's written instructions and the referenced quality standard, and as indicated.
   1. Install fire-rated doors in corresponding fire-rated frames according to NFPA 80.
   2. Coordinate undercutting of doors with Interior finishes.

C. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.
   1. Clearances: Provide 1/8 inch at heads, jambs, and between pairs of doors. Provide 1/4 inch from bottom of door to top of decorative floor finish or covering unless otherwise indicated. Where threshold is shown or scheduled, provide 3/8 inch from bottom of door to top of threshold unless otherwise indicated.
   2. Bevel non-fire-rated doors 1/8 inch in 2 inches at lock and hinge edges.

D. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

E. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

END OF SECTION 081416

SECTION 085213 - WOOD CLAD WINDOWS AND DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes wood/aluminum-clad Doors

1.2 PERFORMANCE REQUIREMENTS

A. Provide doors capable of complying with performance requirements indicated, based on testing manufacturer's doors that are representative of those specified, and that are of test size required by AAMA/WDMA/CSA 101/I.S.2/A440-11.
   1. Air Infiltration, ASTM E 283: Maximum 0.3 cfm/st. ft. at 1.57 psf (25 mph).
   2. Water Resistance, ASTM E 547: No leakage at minimum 6.00 psf (48.41 mph).
   3. Structural Performance, ASTM E 330: Withstands a minimum of 45 psf.
   4. For Doors:
      a. Operating Force: 30 lbf to open, 20 lbf to maintain motion.
      b. Forced Entry: Grade 25

B. Accessibility Requirements: For door hardware on doors in an accessible route, comply with the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines, ICC/ANSI A117.1 and HUD's "Fair Housing Accessibility Guidelines"
   1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Include plans, elevations, sections, hardware, accessories, insect screens, operational clearances, and details of installation, including anchor, flashing, and sealant installation.

C. Samples: For each exposed product and for each color specified, 2 by 4 inches in size.

D. Product Schedule: For wood doors. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

A. Product test reports.

B. Sample warranties.

1.5 QUALITY ASSURANCE

A. WDMA Hallmark Certification: Provide products that have been certified as having been manufactured in accordance with WDMA Hallmark standards. Compliance is verified through independent third party product testing and semi-annual inspections of the manufacturing facility.

B. Engineering Responsibility: Prepare data for architectural wall systems, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in systems similar to those indicated for this Project.

C. Source Limitations: Obtain doors and architectural wall system from single source from single manufacturer.

D. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1.6 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace wood doors that fail in materials or workmanship within specified warranty period.
   1. Insulated Glass: Provide manufacturer’s limited warranty against failure of air seal due to defects in materials or workmanship for period of 20 years from date of manufacture.
   2. Wood Components, Hardware, Weatherstripping, [Screens]: Provide manufacturer’s 10 year limited warranty against defects in workmanship or materials which might unreasonably affect product’s normal functioning.
   3. Metal Clad Warranty:
      a. Commercial 2605 Metal Clad Warranty: Provide manufacturer’s 20 year limited warranty on metal clad coating against cracking, checking, color change, chalking or peeling (adhesion loss) in normal conditions; 10 year limited warranty on metal clad coating against cracking, checking, color change, chalking or peeling (adhesion loss) in extreme conditions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide products as manufactured by Sierra Pacific Windows a Division of Sierra Pacific Industries, or comparable products.

2.2 MATERIALS

A. Wood: Clear ponderosa pine or Douglas Fir kiln dried to a moisture content of 6 to 12 percent at time of fabrication; preservative treated in accordance with WDMA I.S.4 free of visible finger joints, blue stain, knots, pitch pockets, and surface checks larger than 1/32 inch deep by 2 inches wide; water-repellent preservative treated.
   1. Grade: Interior Exposed Wood; Solid clear, suitable for staining.
   2. Transparent finish as indicated in Division 09 Section “Interior Painting”.

B. Aluminum Extrusions and Rolled Aluminum for Cladding: Manufacturer's standard 0.062 inch thick extruded-aluminum cladding 6063 T5 grade, mechanically bonded to exterior exposed wood members.

Provide aluminum alloy and temper recommended by wood door manufacturer for strength, corrosion resistance, and application of required finish, but not less than 22,000-psi ultimate tensile strength, and not less than 16,000-psi minimum yield strength.

1. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
2. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
3. High-Performance Organic Finish for Extrusions and Sheet: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
    a. Fluoropolymer Two-Coat System: Manufacturer's standard two-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 2605.
        1) Match architects sample.

2.3 SWING WOOD DOORS

A. Sills, manufacturers high performance.

A. Drip cap and sills, aluminum.

2.4 HARDWARE

A. Hardware, General: Manufacturer's standard corrosion-resistant hardware sized to accommodate sash weight and dimensions.
    1. Exposed Hardware Color and Finish: As selected by Architect from manufacturer's full range.

B. Aluminum sweep.

C. Weather Stripping:
    1. Frame Weatherstrip: Closed cell foam encapsulated in seamless elastomeric skin; tested in accordance with ASTM C 509, ASTM D 4272, ASTM E 1424, and AAMA 702.
    2. Sash Weatherstrip: Rigid base of 5 percent glass-filled polypropylene with a slip coated thermal plastic elastomer seal.

2.5 GLAZING

A. Insulating-Glass Units: ASTM E 2190.
    1. Glass: ASTM C 1036, Type 1, Class 1, q3.
        a. Tint: Clear.
        b. Safety Glass: Provide Kind FT, fully tempered, labeled safety glass where required.
    2. Filling: Fill space between glass lites with air.
    3. Low-E Coating: On third surface.
    4. Glazing System: Manufacturer's standard factory-glazing system that produces weathertight seal.
    5. Total Thickness: ¾ inches

2.6 FABRICATION

A. Fabricate wood doors in sizes indicated on Drawings. Include a complete system for installing and anchoring doors.

B. Glaze in the factory.

C. Weather strip each operable sash to provide weathertight installation.

D. Provide mullions and cover plates, matching units, complete with anchors for support to structure and installation of units. Allow for erection tolerances and provide for movement of units due to thermal expansion and building deflections. Provide mullions and cover plates capable of withstanding design wind loads of units.

E. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation. Allow for scribing, trimming, and fitting at Project site.

F. Doors: Provide wood doors in configuration indicated on Drawings. Provide door frames, fixed and operating sash, operating hardware, and other trim and components necessary for a complete, secure, and weathertight installation.

G. Dividers (False Muntins): Provide divider grilles in designs indicated for each sash lite.
   1. Quantity and Type: One permanently located between insulating-glass lites.
   2. Configuration: 3/4-inch flat grilles.
   3. Material: Manufacturer's standard.
   4. Pattern: As indicated on drawings.
   5. Color: Matching window sash and frame.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with manufacturer's written instructions for installing doors, hardware, accessories, and other components. For installation procedures and requirements not addressed in manufacturer's written instructions, comply with installation requirements in ASTM E 2112.

B. Install doors level, plumb, square, true to line, without distortion, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction to produce weathertight construction.

C. Clean exposed surfaces immediately after installing doors. Remove excess sealants, glazing materials, dirt, and other substances.

D. Remove and replace sashes if glass has been broken, chipped, cracked, abraded, or damaged during construction period.

3.2 ADJUSTING, CLEANING, AND PROTECTION

A. Adjust operating sashes and ventilators, screens, hardware, and accessories for a tight fit at contact points and weather stripping for smooth operation and weathertight closure. Lubricate hardware and moving parts.

B. Clean exposed surfaces immediately after installing doors Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.

C. Protect doors surfaces from contact with contaminating substances resulting from construction operations. In addition, monitor door surfaces adjacent to and below exterior concrete and masonry surfaces during construction for presence of dirt, scum, alkaline deposits, stains, or other contaminants. If contaminating substances do contact door surfaces, remove contaminants immediately according to manufacturer's written recommendations.

END OF SECTION 085213

SECTION 085313 - VINYL WINDOWS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes vinyl framed windows

1.2 PERFORMANCE REQUIREMENTS

A. General: Provide vinyl windows capable of complying with performance requirements indicated, based on testing manufacturer's windows that are representative of those specified, and that are of test size required by AAMA/WDMA 101/I.S.2/NAFS.

B. System Design: Design and size components to withstand positive and negative dead and live loads caused by wind pressure acting on the normal plane of the window.
   1. Calculate fenestration design pressures in accordance with applicable code (ASCE 7-10)

C. Deflection: For CW Performance Class Limit member deflection to 1/175 of the longest unsupported span dimension. For LC Performance Class, all structural members must comply with the requirements of AAMA 101 9.3.4.3 Uniform Load Structural Test.
   1. Refer to Drawings for Performance Class and Design Pressure.

D. Assembly: To accommodate, without damage to components or deterioration of seals, movement between window and perimeter framing, deflection of lintel.

E. Thermal Resistance of Assembly: U value of 0.26, SHGC 0.27, Dual Glaze.

F. Air Infiltration: Limit air infiltration through assembly to 0.3 cu ft/min/sq ft of wall area, measured at a reference differential pressure across assembly of 1.57psf (for LC performance class) and 6.24psf (for CW performance class) as measured in accordance with ASTM E 283.

G. Condensation Resistance Factor: CRF of 60* when measured in accordance with AAMA 1503.

H. Water Leakage: None, when measured in accordance with ASTM E 547 at a pressure differential as required for specified design pressure.

I. System Internal Drainage: Pressure equalized water management system designed to drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network.

J. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound.

K. Thermal Movement: Design sections to permit movement caused by thermal expansion and contraction of plastic to suit glass, infill, and perimeter opening construction.

L. Design Temperature Range: 120^{O} F

M. Wind Loads: Refer to Drawings for additional information;
   1. Zone 4, Wall, Typical; -23.2 / 23.2 psf
   2. Zone 5, Wall, Corners; -42.7 / 23.2 psf

1.3 GREEN COMMUNITIES SUMITTALS

A. For sealants used inside the weather barrier of the project, submit manufacturer's product data or Safety Data Sheet (SDS) showing printed statements of VOC content in grams per liter (g/L).

1.4 SUBMITTALS

A. Product Data: For each type of vinyl window indicated.

B. Shop Drawings: Include plans, elevations, sections, details, hardware, attachments to other work, operational clearances, and installation details.

C. Samples: For each exposed finish.

D. Product Schedule: Use same designations indicated on Drawings.

E. Product test reports.

F. Maintenance data.

1.5 QUALITY ASSURANCE

A. Installer: A qualified installer, approved by manufacturer to install manufacturer's products.

B. Glazing Publications: Comply with published recommendations of glass manufacturers and with GANA's "Glazing Manual" unless more stringent requirements are indicated.

C. Preinstallation Conference: Conduct conference at Project site.

D. Source Limitations: Provide window from single source.

1.6 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace vinyl windows that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Failure to meet performance requirements.
      b. Structural failures including excessive deflection, water leakage, air infiltration, or condensation.
      c. Faulty operation of movable sash and hardware.
      d. Deterioration of vinyl, other materials, and finishes beyond normal weathering.
      e. Failure of insulating glass.
   2. Warranty Period:
      a. Glazing: 10 years from date of Substantial Completion.
      b. Vinyl Finish: Full lifetime from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GREEN COMMUNITIES PRODUCT REQUIREMENTS

A. Sealants must comply with the limits of VOC content as indicated in Division 1 Sustainable Design Requirements. Preference shall be given to products that do not contain orthophthalate plasticizers (phthalate-free).

2.2 WINDOW (Option 1)

A. Basis-of-Design Product: The design for vinyl windows systems is based on product Endurance Series as manufactured by VPI Quality Windows Subject to compliance with requirements, provide the named product or a comparable product.

B. Vinyl Windows: Extruded, hollow, tubular, ultra-violet resistant polyvinyl chloride (PVC) with integral color; factory fabricated; with factory installed vision glass, related flashings, anchorage and attachment devices.

C. Windows: Extruded, hollow, tubular, ultra-violet resistant polyvinyl chloride (PVC) with integral color; factory fabricated; with vision glass, related flashings, anchorage and attachment devices.
1. Performance Requirements: AAMA/WDMA/CSA 101/I.S.2/A440 CW70. Multi panel configuration: Double and triple wide config-CW70, Triple wide double tall CW-40.
2. Configuration: Fixed, non-operable, outward opening, side hinged, outward opening.

D. Finish: SuperCapSR color technology by Quanex. Co-extruded, thermally fused acrylic color layers. Needs to meet AAMA 614, AAMA 615 and ASTM D3363.
1. Color: Architectural Bronze.

E. Frames: 3 1/2 inch wide x 3 1/4 inch deep profile; chambered glaze bead..

F. Mullion: 4 7/8 inch wide x 3 1/4 inch deep profile.

G. Sills: 3 1/2 inch nominal thickness, with pressure equalized drainage system.

H. Insect Screens: Woven fiberglass mesh; 14/18 mesh size.
1. Color: Gray.

I. Operable Sash Weather Stripping: extruded; permanently resilient, profiled to effect weather seal.

J. Provide manufacturers standard nail fin.

2.3 WINDOW (Option 2)

A. Basis-of-Design Product: The design for vinyl windows systems is based on product 76 MD System as manufactured by Kommerling USA Inc Subject to compliance with requirements, provide the named product or a comparable product.
1. Exterior Color (Ceylon C-34 Dark Bronze)
2. Interior Color (White)
3. U-PVC Steel Sash and Frame Reinforce

B. Hardware Color: Bronze

C. 1 inches Insulated Glass Solar Ban 60
1. U-Value of .26 W/Argon Gas or .31 W/O.

D. STC Value of 33

E. Performance Grade LC 65 AAMA/WDMA/CSA 101/I.S.2 A440-11/08
1. DP 65

2.4 GLAZING

A. Glazing System: Manufacturer's standard factory-glazing system that produces weathertight seal.

B. Insulating-Glass: Double glazed units

C. Glazing System: Manufacturer's standard factory-glazing system that produces weathertight seal.

D. Capillary tube, as recommended by manufacturer for elevation.

E. Spacers: Manufacturers high performance.

F. Dual sealed assembly, perimeter sealant 2 component polyurethane

2.5 INSECT SCREENS (at operable windows only)

A. General: Design windows and hardware to accommodate screens in a tight-fitting, removable arrangement, with a minimum of exposed fasteners and latches. Fabricate insect screens to fully integrate with window frame. Locate screens on outside of window and provide for each operable exterior sash or ventilator.
   1. Aluminum Tubular Frame Screens: Comply with SMA 1004, "Specifications for Aluminum Tubular Frame Screens for Windows," Architectural C-24 class.

B. Glass-Fiber Mesh Fabric: 18-by-14 or 18-by-16 mesh of PVC-coated, glass-fiber threads; woven and fused to form a fabric mesh resistant to corrosion, shrinkage, stretch, impact damage, and weather deterioration, in the following color. Comply with ASTM D 3656.
   1. Mesh Color: Charcoal gray.

C. Wickets: Provide wickets, framed and trimmed for a tight fit and for durability during handling.

2.6 OPERABLE HARDWARE

A. Sash lock: Lever handle with cam lock.

B. Operator: Lever action handle fitted to projecting sash arms, limit stops available.

C. Projecting Sash Arms: Cadmium plated steel, friction pivot joints with nylon bearings, removable pivot clips for cleaning.

D. Finish for exposed hardware: Color matched baked enamel.

E. ADA Accessible Hardware: Locate on windows indicated on the Drawing.
   1. Product: ADA Operator Handle.

F. Provide all windows with manufacturers standard stoppers installed to limit the opening of windows per ASTM F 2090, “Standard Specification for Window Fall Prevention Devices with Emergency Escape (Egress) Release Mechanisms.” And compliant with International Building Code.
   1. Required on all windows above Level 1.

2.7 FABRICATION

A. Fabricate framing, mullions and sash members with fusion welded corners and joints, in a rigid jig. Supplement frame sections with internal reinforcement where required for structural rigidity.

B. Form sills in one piece.

C. Form snap-in glass stops, closure molds, weather stops, and flashings of extruded PVC for tight fit into window frame section.

D. Form weather stop flange to perimeter of unit.

E. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.

F. Arrange fasteners to be concealed from view.

G. Permit internal drainage weep holes and channels to migrate moisture to exterior. Provide internal drainage of glazing spaces to exterior through weep holes.

H. Assemble insect screen frame, miter and reinforced frame corners. Fit mesh taut into frame and secure. Fit frame with four spring loaded steel pin retainers.

I. Double weather-strip operable units.

J. Factory glaze window units.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with Drawings, Shop Drawings, and manufacturer's written instructions for installing windows, hardware, accessories, and other components.

B. Install level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.

C. Set sill members in bed of sealant or with gaskets, as indicated, for weathertight construction.

D. Separate corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

E. Adjust operating sashes and ventilators, screens, hardware, and accessories for a tight fit at contact points and weather stripping for smooth operation and weathertight closure. Lubricate hardware and moving parts.

F. Clean exposed surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.

G. Clean factory-glazed glass immediately after installing windows. Comply with manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels, and clean surfaces.

H. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

I. Maximum Variation from Level or Plumb: 0.06 inches every 3 ft. non-cumulative or 0.5 inches per 100 ft. whichever is less.

3.2 FIELD QUALITY CONTROL

A. Test installed windows for compliance with performance requirements for water penetration, in accordance with ASTM E 1105 using uniform pressure and same pressure difference as specified for laboratory tests.
   1. Test one window of each type, as directed by Architect.
   2. If any window fails, test additional windows at Contractor's expense.

B. Replace windows that have failed field testing and retest until performance is satisfactory.

END OF SECTION 085313

SECTION 092116 - GYPSUM BOARD SHAFT-WALL ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes gypsum board shaft-wall assemblies for the following:
   1. Shaft-wall enclosures.
   2. Chase enclosures.

1.2 SUBMITTALS

A. Product Data: For each gypsum board shaft-wall assembly indicated.

1.3 QUALITY ASSURANCE

A. Fire-Resistance Ratings: Provide materials and construction identical to those of assemblies with fire-resistance ratings determined according to ASTM E 119 by a testing and inspecting agency.

B. STC-Rated Assemblies: Provide materials and construction identical to those of assemblies tested according to ASTM E 90 and classified according to ASTM E 413 by a testing and inspecting agency.

C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures for installing gypsum board shaft-wall assemblies including, but not limited to, the following:
   1. Fasteners proposed for anchoring nonstructural steel framing to building structure.
   2. Sprayed fire-resistive materials applied to structural steel framing.
   3. Wiring devices in shaft-wall assemblies.
   4. Doors and other items penetrating shaft-wall assemblies.
   5. Items supported by shaft-wall-assembly framing.
   6. Mechanical work enclosed within shaft-wall assemblies.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages, containers, and bundles bearing brand name and identification of manufacturer or supplier.

B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.

C. Stack panels flat on leveled supports off floor or slab to prevent sagging.

1.5 PROJECT CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or with gypsum board manufacturer's written recommendations, whichever are more stringent.

B. Do not install interior products until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, moisture damaged, or mold damaged.
   1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, and irregular shape.
   2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 GYPSUM BOARD SHAFT-WALL ASSEMBLIES, GENERAL

A. Provide materials and components complying with requirements of fire-resistance-rated assemblies indicated.
   1. Provide panels in maximum lengths available to eliminate or minimize end-to-end butt joints.
   2. Provide auxiliary materials complying with gypsum board shaft-wall assembly manufacturer's written recommendations.

B. Preference shall be given to products/materials that have a product-specific Type III Environmental Product Declaration (EPD).

2.2 PANEL PRODUCTS

A. Gypsum Liner Panels: Comply with ASTM C 442/C 442M.
   1. Type X: Manufacturer's proprietary liner panels with moisture-resistant paper faces.
      a. Core: 1 inch thick.
      b. Long Edges: Double bevel.
   2. Basis of Design: American Gypsum or approved equal.

B. Gypsum Board: As specified in Division 9 Section "Gypsum Board."

C. Water-Resistant Gypsum Backing Board: As specified in Division 09 Section "Gypsum Board."

2.3 NON-LOAD-BEARING STEEL FRAMING

A. Framing Members: Comply with ASTM C 754 for conditions indicated. C-H or C-T

B. Tracks: Top runner manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire-resistance-rated assembly indicated.

C. Steel Sheet Components: Comply with ASTM C 645 requirements for metal, unless otherwise indicated.
   1. Protective Coating: ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized, unless otherwise indicated.

D. Refer to Division 09 Section “Non-Structural Metal Framing.”

2.4 AUXILIARY MATERIALS

A. All sealants and adhesives applied within the air barrier of the building must comply with VOC requirements as indicated in Division 01 Section “Sustainable Design Requirements”.

B. General: Provide auxiliary materials that comply with referenced product standards and manufacturer's written recommendations.

C. Trim Accessories: Cornerbead, edge trim, and control joints of material and shapes specified in Division 09 Section "Gypsum Board" that comply with gypsum board shaft-wall assembly manufacturer's written recommendations for application indicated.

D. Gypsum Board Joint-Treatment Materials: As specified in Division 09 Section "Gypsum Board."

E. Laminating Adhesive: Adhesive or joint compound recommended by manufacturer for directly adhering gypsum face-layer panels and gypsum-base face-layer panels to backing-layer panels in multilayer construction.

F. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
   1. For fastening backer board units, use screws of type and size recommended by panel manufacturer.

G. Track Fasteners: Power-driven fasteners of size and material required to withstand loading conditions imposed on shaft-wall assemblies without exceeding allowable design stress of track, fasteners, or structural substrates in which anchors are embedded.
   1. Expansion Anchors: Fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 5 times design load, as determined by testing per ASTM E 488 conducted by a qualified testing agency.
   2. Sound Attenuation Blankets: Refer to Division 09 Section “Gypsum Board.”.

H. Acoustical Sealant: As specified in Division 7 Section "Joint Sealants."

2.5 GYPSUM BOARD SHAFT-WALL ASSEMBLIES

A. Fire-Resistance Rating: As indicated.

B. Studs: Manufacturer's standard profile for repetitive members, corner and end members, and fire-resistance-rated assembly indicated.
   1. Depth: As indicated.
   2. Minimum Base-Metal Thickness: 20 gauge (0.0312 inch) minimum
   3. Type: C-H or C-T

C. Runner Tracks: Manufacturer's standard J-profile track with long-leg length as standard with manufacturer, but at least 2 inches long and in depth matching studs.
   1. Minimum Base-Metal Thickness: As indicated.

D. Firestop Tracks: Provide firestop track at head of shaft wall on each floor level.

E. Elevator Hoistway Entrances: Manufacturer's standard J-profile jamb strut with long-leg length of 3 inches, matching studs in depth.

F. Insulation: Sound attenuation blankets, as listed in Division 07 Section “Building Insulation”.

G. Room side finish: As indicated.

H. Shaft side Finish: As indicated.

I. Refer to Gypsum board shaft-wall Assembly Schedule at the end of this section.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates to which gypsum board shaft-wall assemblies attach or abut, with Installer present, including hollow-metal frames, elevator hoistway door frames, cast-in anchors, and structural framing. Examine for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, or mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Sprayed Fire-Resistive Materials: Coordinate with gypsum board shaft-wall assemblies so both elements of Work remain complete and undamaged. Patch or replace sprayed fire-resistive materials removed or damaged during installation of shaft-wall assemblies to comply with requirements specified in Division 7 Section "Sprayed Fire-Resistive Materials."
   1. Before sprayed fire-resistive materials are applied, attach offset anchor plates or ceiling runner tracks to surfaces indicated to receive sprayed fire-resistive materials. Where offset anchor plates are required, provide continuous plates fastened to building structure not more than 24 inches o.c.

B. After sprayed fire-resistive materials are applied, remove only to extent necessary for installation of gypsum board shaft-wall assemblies and without reducing the fire-resistive material thickness below that which is required to obtain fire-resistance rating indicated. Protect remaining fire-resistive materials from damage.

3.3 INSTALLATION

A. General: Install gypsum board shaft-wall assemblies to comply with requirements of fire-resistance-rated assemblies indicated, manufacturer's written installation instructions, and the following:
   1. ASTM C 754 for installing steel framing except comply with framing spacing indicated.
   2. Division 09 Section "Gypsum Board" for applying and finishing panels.

B. Do not bridge architectural or building expansion joints with shaft-wall assemblies; frame both sides of expansion joints with furring and other support.

C. Install supplementary framing in gypsum board shaft-wall assemblies around openings and as required for blocking, bracing, and support of gravity and pullout loads of fixtures, equipment, services, heavy trim, furnishings, and similar items that cannot be supported directly by shaft-wall assembly framing.
   1. Where handrails directly attach to gypsum board shaft-wall assemblies, provide galvanized steel reinforcing strip with 0.0312-inch minimum thickness of base (uncoated) metal, accurately positioned and secured behind at least 1 gypsum board face-layer panel.

D. At penetrations in shaft wall, maintain fire-resistance rating of shaft-wall assembly by installing supplementary steel framing around perimeter of penetration and fire protection behind boxes containing wiring devices, elevator call buttons, elevator floor indicators, and similar items.

E. Isolate perimeter of gypsum panels from building structure to prevent cracking of panels, while maintaining continuity of fire-rated construction.

F. Firestop Tracks: Install to maintain continuity of fire-resistance-rated assembly indicated.

G. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect, while maintaining fire-resistance rating of gypsum board shaft-wall assemblies.

H. Seal gypsum board shaft walls with acoustical sealant at perimeter of each assembly where it abuts other work and at joints and penetrations within each assembly. Install acoustical sealant to withstand dislocation by air-pressure differential between shaft and external spaces; maintain an airtight and smoke-tight seal; and comply with ASTM C 919 requirements or with manufacturer's written instructions, whichever are more stringent.

I. Cant Panels: At projections into shaft exceeding 4 inches, install 1/2- or 5/8-inch- thick gypsum board cants covering tops of projections.

J. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

3.4 PROTECTION

A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

B. Remove and replace panels that are wet, moisture damaged, or mold damaged.
   1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, and irregular shape.
   2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

3.5 DISPOSAL

A. Construction Waste shall be managed in accordance with provisions of Division 01 Section “Construction Waste Management and Disposal”. Documentation shall be submitted to satisfy the requirements of that section.

3.6 GYPSUM BOARD SHAFT-WALL ASSEMBLY SCHEDULE

A. Gypsum Board Shaft Wall Assembly, Wall (for 2 hour resistive construction): Where this designation is indicated, provide assembly complying with the following:
   1. Available Fire-Resistive Rated Assembly: UL Design U468, 1 hour or U438, 2 hour.
   2. Intermittent Air-Pressure Loads: 7.5 lbf/sq.ft
   3. Deflection Limit: L/240.
   4. Stud Depth: 2 1/2 inches, refer to typical construction types.
   5. Stud Runner and Track Base Metal Thickness: Provide manufacturer’s standard thickness that complies with structural performance requirements of stud depth indicated but not less that 20 gauge (0.0312 inches).
   6. Rood-Side Finish: As indicated.
   7. Shaft-Side Finish: As indicated by fire-resistive-rated assembly design designation above.

B. Horizontal Gypsum Board Shaft Wall Assembly, Ceiling (for 2 hour resistive construction): At duct enclosures and other locations to maintain the integrity of the fire rated enclosure, provide assembly complying with the following:
   1. Available Fire-Resistive Rated Assembly: 2 hour-Test No: WHI-495 PSH 0154/0167 (Horizontal Shaft-Wall Assemblies) United Gypsum Co 2 hour Test: WHI 694-0300/1 (Horizontal Shaft-Wall Assemblies) National Gypsum Company.
   2. Intermittent Air-Pressure Loads: 5 lbf/sq.ft
   3. Deflection Limit: L/240.
   4. Stud Depth: 2 1/2 inches, refer to typical construction types.
   5. Stud Runner and Track Base Metal Thickness: Provide manufacturer’s standard thickness that complies with structural performance requirements of stud depth indicated but not less that 20 gauge (0.0312 inches).
   6. Rood-Side Finish: As indicated.
   7. Shaft-Side Finish: As indicated by fire-resistive-rated assembly design designation above.

END OF SECTION 092116

SECTION 092900- GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Interior gypsum board.
   2. Exterior gypsum board for ceilings and soffits.
   3. Wall sheathing.
   4. Tile backing panels.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples:
   1. Trim Accessories: Full-size Sample in 12-inch- long length for each trim accessory indicated.
   2. Textured Finishes: 24 inches by 24 inches for each textured finish indicated and on same backing indicated for Work.

1.3 QUALITY ASSURANCE

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

C. Mockups: Before beginning gypsum board installation, install mockups of at least 100 sq. ft. in surface area to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Install mockups for the following:
      a. Each level of gypsum board finish indicated for use in exposed locations.
      b. Each texture finish indicated.
   2. Apply or install final decoration indicated, including painting and wallcoverings, on exposed surfaces for review of mockups.
   3. Simulate finished lighting conditions for review of mockups.
   4. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

PART 2 - PRODUCTS

2.1 INTERIOR GYPSUM BOARD

A. Preference shall be given to products/materials that have a product-specific Type III Environmental Product Declaration (EPD).

B. Preference shall be given to products that have a Health Product Declaration (HPD)

C. General: Complying with ASTM C 1396/C 1396M, as applicable to type of gypsum board indicated and whichever is more stringent.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, the following:
   a. Certainteed
   b. American Gypsum
   c. National Gypsum Company.
   d. USG Corporation.
2. Gypsum board manufactured in China will not be accepted.

D. Regular Type:
1. Thickness: 1/2 inch.
2. Long Edges: Tapered.

E. Type X:
1. Thickness: As indicated.
2. Long Edges: Tapered.

F. Ceiling Type: Manufactured to have more sag resistance than regular-type gypsum board.
1. Thickness: 1/2 inch.
2. Long Edges: Tapered.

G. Impact-Resistant Gypsum Board: ASTM C1396/C1396M gypsum board, tested according to ASTM C1629/C1629M.
1. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.
2. Thickness: As indicated.
3. Long Edges: Tapered.
4. Compliant with Level 2 as defined by ASTM C1629/C1629M

H. Moisture- and Mold-Resistant Type: With moisture- and mold-resistant core and surfaces.
1. Must comply with meet ASTM D 3273.
2. Core: 5/8 inch, Type X.
3. Long Edges: Tapered.
4. Mold resistance per ASTM D3273: 10.

I. Tile Backing Panels (Vertical Walls): Cementitious Backer Units: ANSI A118.9 or ASTM C 1325.
1. Thickness: As indicated.

J. Type C:
1. Thickness: 5/8 inch.
2. Long Edges: Tapered.

2.2 SUSTAINABLE INTERIOR GYPSUM BOARD (ALTERNATE)

A. Gypsum Board ASTM C1396/C1396M: Type X.

B. Basis of Design: Subject to compliance with project requirements, the design is based on the following: United States Gypsum Company, LLC, "USG Sheetrock® Brand EcoSmart Panels Firecode® X".
1. Carbon emissions per Gypsum Association; Industry Standard Type III EPD for North American Type X wallboard with a manufacturing Global Warming Potential of: Western USA 232kg CO2-eq./1000 ft2.
2. Water reduction per Gypsum Association; Industry Standard Type III EPD for North American Type X wallboard having net use fresh water value of: Western USA 1.0 m3/1000 ft2.
3. Primary Energy from non-renewable resources per Gypsum Association; Industry Standard Type III EPD for North American Type X wallboard have a value of 5,291 MJ/1000 ft2Western USA 3,986 MJ/1000 ft2.

4. UL Type Designation “ULIX”.
5. ASTM E136 Noncombustibility: Meets or exceeds criteria.
6. ASTM E84 Surface-Burning Characteristics:
    a. Flame Spread: 5.
    b. Smoke Developed: 5.
    c. Classification: Class A.
7. ASTM C473:
    a. Core Hardness: Meets or Exceeds 11 (ASTM C473 B).
    b. Flexural Strength (lbft).
        1) Parallel: Not less than 46.
        2) Perpendicular: Not less than 147.
    c. Nail Pull Resistance (lbft) ASTM C473 (B): Not less than 87.
8. Thickness: 5/8 inch
9. Long Edges: Tapered.

2.3 EXTERIOR GYPSUM BOARD FOR CEILINGS AND SOFFITS

A. Exterior Gypsum Soffit Board: ASTM C 1396/C 1396M, with manufacturer's standard edges.
1. Core: As indicated.

B. Glass-Mat Gypsum Sheathing Board: ASTM C 1177/C 1177M.
1. Basis of Design: Subject to compliance with requirements, provide "Dens-Glass Gold" by G-P Gypsum, or approved equal
2. Core: As indicated.

2.4 WALL SHEATHING

A. Glass-Mat Gypsum Wall Sheathing: ASTM C 1177/1177M.
1. Product: Subject to compliance with requirements, provide "Dens-Glass Gold" by G-P Gypsum.
2. Type and Thickness: Type X, 5/8 inch thick.

2.5 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.
1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.
2. Shapes:
    a. Cornerbead.
    b. LC-Bead: J-shaped; exposed long flange receives joint compound.
    c. L-Bead: L-shaped; exposed long flange receives joint compound.
    d. U-Bead: J-shaped; exposed short flange does not receive joint compound.
    e. Expansion (control) joint.
    f. Curved-Edge Cornerbead: With notched or flexible flanges.

B. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    a. Fry Reglet Corp.
    b. Gordon, Inc.
    c. Pittcon Industries.
2. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B 221, Alloy 6063-T5.
3. Finish: Corrosion-resistant primer compatible with joint compound and finish materials specified.

2.6 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:
1. Interior Gypsum Wallboard: Paper.
2. Exterior Gypsum Soffit Board: Paper.
3. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
4. Tile Backing Panels: As recommended by panel manufacturer.

C. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
1. Prefilling: At open joints, and damaged surface areas, use setting-type taping compound.
2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
   a. Use setting-type compound for installing paper-faced metal trim accessories.
3. Fill Coat: For second coat, use drying-type, all-purpose compound.
4. Finish Coat: For third coat, use drying-type, all-purpose compound.

D. Joint Compound for Exterior Applications:
1. Exterior Gypsum Soffit Board: Use setting-type taping compound and setting-type, sandable topping compound.
2. Glass-Mat Gypsum Sheathing Board: As recommended by sheathing board manufacturer.

E. Joint and Penetration Treatment Materials for Wall Sheathing
1. Sealant for Glass-Mat Gypsum Sheathing Board: Elastomeric silicone joint sealant recommended by sheathing manufacturer.

F. Joint Compound for Tile Backing Panels:
1. Water-Resistant Gypsum Backing Board: Use setting-type taping compound and setting-type, sandable topping compound.
2. Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel manufacturer.
3. Cementitious Backer Units: As recommended by backer unit manufacturer.

2.7 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.

B. Adhesives for Field Gluing Panels to Framing: Formulation complying with ASTM D 3498 that is approved for use indicated by manufacturers of both adhesives and panels.

C. Flexible Flashing: Self-adhesive, rubberized-asphalt compound, bonded to a high-density, polyethylene film to produce an overall thickness of not less than 0.025 inch.

D. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

E. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

F. Sound Attenuation Blankets: Refer to Division 7 Section “Thermal Insulation”.

G. Acoustical Sealant: As specified in Division 7 Section "Joint Sealants."

H. Thermal Insulation: As specified in Division 7 Section "Building Insulation."

PART 3 - EXECUTION

3.1 INSTALLATION OF NON-STRUCTURAL METAL FRAMING

A. Installation Standard: ASTM C 754.
1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.

3.2 APPLYING AND FINISHING PANELS, GENERAL

A. Comply with ASTM C 840.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- wide spaces at these locations, and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

D. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

3.3 APPLYING INTERIOR GYPSUM BOARD

A. Install interior gypsum board in the following locations:
1. Regular Type: Vertical surfaces, unless otherwise indicated.
2. Type X: As indicated on Drawings.
3. Flexible Type: Apply in double layer at curved assemblies.
4. Ceiling Type: Type ‘C’ unless indicated otherwise..
5. Foil-Backed Type: As indicated on Drawings.
6. Moisture- and Mold-Resistant Type: As indicated on Drawings.

3.4 APPLYING EXTERIOR GYPSUM PANELS FOR CEILINGS AND SOFFITS

A. Apply panels perpendicular to supports, with end joints staggered and located over supports.
1. Install with 1/4-inch open space where panels abut other construction or structural penetrations.
2. Fasten with corrosion-resistant screws.

3.5 APPLYING TILE BACKING PANELS

A. Water-Resistant Gypsum Backing Board: Install at showers, tubs, and where indicated. Install with 1/4-inch gap where panels abut other construction or penetrations.

B. Cementitious Backer Units: ANSI A108.11, at showers, and where indicated.

C. Areas Not Subject to Wetting: Install regular-type gypsum wallboard panels to produce a flat surface except at showers, tubs, and other locations indicated to receive water-resistant panels.

D. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

3.6 INSTALLATION OF WALL SHEATHING

A. Securely attach to substrate by fastening as indicated, complying with the following:
   1. NES NER-272 for power-driven fasteners.
   2. Table 2304.9.1, "Fastening Schedule," in ICC's "International Building Code."

B. Comply with GA-253 and with manufacturer's written instructions.
   1. Fasten gypsum sheathing to cold-formed metal framing with screws.
   2. Install boards with a 3/8-inch gap where non-load-bearing construction abuts structural elements.
   3. Install boards with a 1/4-inch gap where they abut masonry or similar materials.

C. Sheathing Joint and Penetration Treatment:
   1. Seal sheathing joints according to sheathing manufacturer's written instructions.
   2. Apply elastomeric sealant to joints and fasteners and trowel flat. Seal other penetrations and openings.
   3. Apply glass-fiber sheathing tape to glass-mat gypsum sheathing board joints, and apply and trowel silicone emulsion sealant to embed tape in sealant. Apply sealant to exposed fasteners. Seal other penetrations and openings.

3.7 INSTALLING TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.

C. Interior Trim: Install in the following locations:
   1. Cornerbead: Use at outside corners, unless otherwise indicated.
   2. LC-Bead: Use at exposed panel edges.
   3. L-Bead: Use where indicated.
   4. U-Bead: Use at exposed panel edges.
   5. Curved-Edge Cornerbead: Use at curved openings.

D. Exterior Trim: Install in the following locations:
   1. Cornerbead: Use at outside corners.
   2. LC-Bead: Use at exposed panel edges.

E. Aluminum Trim: Install in locations indicated on Drawings.

3.8 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints, and damaged surface areas.

C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
   1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
   2. Level 2: Panels that are substrate for tile.
   3. Level 3: At mechanical and electrical rooms.
   4. Level 4: At units, corridors, and other rooms as indicated.
   5. Level 5: Where required for wallcovering.

E. Glass-Mat Gypsum Sheathing Board: Finish according to manufacturer's written instructions for use as exposed soffit board.

F. Glass-Mat, Water-Resistant Backing Panels: Finish according to manufacturer's written instructions.

G. Cementitious Backer Units: Finish according to manufacturer's written instructions.

3.9 PROTECTION

A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

B. Remove and replace panels that are wet, moisture damaged, and mold damaged.
   1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
   2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900

SECTION 093000 - TILING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Installation for the following
      a. Porcelain tile.
      b. Stone tile.
      c. Large format thin porcelain panels
      d. Glazed wall tile
      e. Glass tile
      f. Mosaic
   2. Waterproof membrane.
   3. Crack isolation membrane.
   4. Sealer
   5. Metal edge strips.

1.2 SUBMITTALS

A. Samples:
   1. Each type and composition of tile and for each color and finish required.
   2. Assembled samples, with grouted joints, for each type and composition of tile and for each color and finish required.

1.3 QUALITY ASSURANCE

A. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Build mockup of each type of floor tile installation.
   2. Build mockup of each type of wall tile installation.
   3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.4 EXTRA MATERIALS

A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering and identified with labels describing contents.
   1. Tile and Trim Units: Furnish quantity of full-size units equal to 2 cartons (maximum of 24 pieces) of amount installed for each type, composition, color, pattern, and size indicated.
   2. Keep any full size tiles as attic stock

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For finish to include in maintenance manuals. Include the following:
   1. Methods for maintaining finish, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
   2. Precautions for cleaning materials and methods that could be detrimental to finish

PART 2 - PRODUCTS

2.1 TILE PRODUCTS

A. Preference shall be given to products/materials that have a product-specific Type III Environmental Product Declaration (EPD).

B. ANSI Tile Standard:
1. Provide Standard grade tile that complies with ANSI A137.1 for ceramic tile, compositions, and other characteristics indicated.
2. Provide Standard grade tile that complies with ANSI A137.2 for glass tile, compositions, and other characteristics indicated.

C. Interior Tile types, sizes and colors indicated on the Drawings.

D. Trim Pieces: Refer to Details and Elevations and plans.
1. Schluter System L.P; Cove Base at Public Space restroom.
2. Schluter System L.P; Jolly at Public Space restroom (at top of wainscot).
   a. Finish as indicated.

2.2 THRESHOLDS

A. General: Fabricate to sizes and profiles indicated or required to provide transition between adjacent floor finishes.
1. Bevel edges at 1:2 slope, with lower edge of bevel aligned with or up to 1/16 inch above adjacent floor surface. Finish bevel to match top surface of threshold. Limit height of threshold to 1/2 inch or less above adjacent floor surface.

B. General: Manufacturer's standard product that complies with ANSI A118.10 and is recommended by the manufacturer for the application indicated.

2.3 WATERPROOF MEMBRANE

A. General: Manufacturer's standard product, that complies with ANSI A118.10 for high performance and is recommended by the manufacturer for the application indicated.

B. Corrugated Polyethylene (Showers): Corrugated polyethylene with dovetail-shaped corrugations and with anchoring webbing on the underside; 3/16-inch nominal thickness. (Where indicated on plans)
1. Basis of Design: Schluter Systems L.P.; DITRA.

2.4 CRACK ISOLATION MEMBRANE

A. General: Manufacturer's standard product that complies with ANSI A118.12 for high performance and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.

B. Fabric-Reinforced, Fluid-Applied Membrane: System consisting of liquid-latex rubber or elastomeric polymer and fabric reinforcement. (Shower Floors)
1. Basis of Design: Merkrete Systems, Parex USA, Inc.; Hydro-Guard 2000.

2.5 SETTING MATERIALS

A. Preference shall be given to products that have a Health Product Declaration (HPD)

B. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4.
1. Basis of Design: Subject to compliance with requirements, provide Laticrete International, Inc, or approved equal
2. which only water must be added.

C. Organic Adhesive: ANSI A136.1, Type I.

2.6 GROUT MATERIALS

A. Preference shall be given to products that have a Health Product Declaration (HPD)

B. High Performance Latex (Polymer) Modified Grout: ANSI A 118.6 and A118.7
1. Joint widths from 1/8 to 1 inches: (Do not use on stone or glazed wall tiles)
2. Joint widths narrower than 1/8 inches:
3. Basis of Design: Subject to compliance with requirements, provide Laticrete International, Inc, or approved equal

C. Sanded Portland Cement Grout: ANSI A108.10.
1. Basis of Design: Subject to compliance with requirements, provide Laticrete International, Inc, or approved equal

D. Organic Adhesive: ANSI A136.1, for glass mosaic tile.

E. Grout for Pregrouted Tile Sheets: Same product used in factory to pregrout tile sheets.

2.7 JOINT SEALANTS

A. Preference shall be given to products that have a Health Product Declaration (HPD)

B. General: Provide sealants, primers, backer rods, and other sealant accessories that comply with the following requirements and with the applicable requirements in Division 07 Section "Joint Sealants."
1. Filling of all movement joints on large porcelain panels, comply with TCNA EJ171

2.8 MISCELLANEOUS MATERIALS

A. Preference shall be given to products that have a Health Product Declaration (HPD)

B. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.

C. Metal Edge/Transition Strips: Extruded aluminum with satin finish of profile and width shown, of height required to protect exposed edge of carpet, and of maximum lengths to minimize running joints.

D. Grout Sealer: Manufacturer's standard product for sealing grout joints and that does not change color or appearance of grout.
1. Basis of Design: Subject to compliance with requirements, provide Laticrete International, Inc, or approved equal

E. Metallic transition strips for terrazzo large format tile, refer to manufacturers recommendations

1. Finish: as selected from manufacturers full range.
2. As manufactured by Schluter Systems, L.P
   a. Control Joints: DI LEX-EDP, Item No. EDP100
   b. Expansion Joints: DILEX-BT, Item No. AEBT100
   c. Cove Trim: DILEX-AHK, Item No. AHK1S100AE
   d. Transition Strip: Reno-Ramp, AERP 100 B65

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
   1. Verify that substrates for setting tile are firm, dry, clean, free of coatings that are incompatible with tile-setting materials including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
   2. Verify that concrete substrates for tile floors installed with adhesives or thinset mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.
   3. Verify flatness of concrete surface prior to the installation of large format tile.
      a. The substrate receiving the thin-body porcelain tile should be prepared to a floor flatness (FF) of > 50. All approved and properly prepared substrates should have no more than a permissible variation of 1/8 inches in 10 ft (3 mm in 3,05 m) from the required plane; nor more than 1/16 in 12 inches (2 mm in 30 cm) when measured from high points in the surface with a straight edge.
      b. Refer to Manufacturers written recommendations, correct floor levelness as required to comply with the allowable deflection of L/480.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with thin-set mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.

B. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot toward drains.

C. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

D. Field-Applied Temporary Protective Coating: If indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.3 INSTALLATION

A. Comply with current issue of TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.
   1. For the following installations, follow procedures in the ANSI A108 series of tile installation standards for providing 95 percent mortar coverage:
      a. Tile floors in wet areas.
      b. Tile floors consisting of tiles 8 by 8 inches or larger.
      c. Tile floors consisting of rib-backed tiles.

B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

C. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

D. Where accent tile differs in thickness from field tile, vary setting bed thickness so that tiles are flush.

E. Jointing Pattern: Lay tile in grid pattern indicated on floor finish plan. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.

F. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:
   1. Mosaic Tile Floor and Wall: Match mesh.
   2. Glazed Wall Tile: 1/16 inch.
   3. Porcelain Tile: 1/8 inch.
   4. Large Porcelain Tile: 1/16 inch
   5. Medium format tile: 1/16 inches

G. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.

H. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
   1. Comply with TCNA handbook detail EJ-171 or other approved detail.
   2. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.
   3. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."
   4. Coordinate location with Architect.

I. Metal Edge Strips: Install where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with or below top of tile and no threshold is indicated.

J. Testing, test grout on each type of tile separate sample area prior to grouting entire floor, do not proceed until grout has cured and there are no visible stains or other discoloration. Take all necessary precaution to ensure that tiles are compatible with grout and grout sealer.

K. Grout Sealer: Apply grout sealer to cementitious grout joints in tile floors according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.

L. Stone Sealer: Apply to cleaned stone tile flooring according to sealer manufacturer's written instructions.

M. Install panels and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated. Use latex-portland cement mortar for bonding material unless otherwise directed in manufacturer's written instructions.

N. Install waterproofing, sound isolation and crack isolation membrane to comply with ANSI A108.13 and manufacturer's written instructions to produce membrane of uniform thickness and bonded securely to substrate.
1. At steam showers seal all penetrations and joints in waterproofing membrane according to manufacturers requirements.

O. Installation of large panel porcelain tile, comply with manufacturers strict instructions for floor and wall installation.
1. Use precaution when moving and installing the tiles.
2. Comply with ANSI A108 ANSI AN-2 “General Requirements for Sub-Surfaces”.

3.4 INTERIOR FLOOR TILE INSTALLATION SCHEDULE

A. Interior Floor Installations, Concrete Subfloor:
1. Tile Installation F112: Medium-set mortar TCNA F112 (over waterproofing membrane where indicated).
   a. Tile Type: Confirm compatibility of installation products with tile supplied.
      1) Tile Type: Refer to Drawings for size and type.
   b. Medium-Set Mortar: Latex modified-portland cement mortar.
   c. Grout: Polymer modified grout.
2. Tile Installation F125A: Thin-set mortar on crack isolation membrane; TCNA F125A.
   a. Tile Type: Tiles smaller than 16x16 inches
   b. Thin-Set Mortar: Latex modified-portland cement mortar.
   c. Grout: High Performance Latex (Polymer) Modified
3. Stone Tile Installation: TCNA F125-Full STONE; Medium mortar over waterproof membrane on concrete.
   a. Tile Type: Natural Stone.
   b. Medium Mortar: Latex-portland cement mortar.
   c. Grout sealer.
   d. Stone tile sealer.
   e. Grout: High Performance Latex (Polymer) Modified.

B. Specialty Floor Installations (Terrazzo Large format Tile):
1. Comply with manufacturers recommendations
2. All products as provided by Laticrete International, Inc. 25 year Warranty: Complete systems approved equal.
   a. Self Leveling Underlayment: 86 Latilevel (if required)
   b. Admix Primer: 816 Latipatch (If required)
   c. Crack Isolation/Waterproofing Membrane: Hyrdo Ban
   d. Latex Thin Set Mortar: Laticrete 254 Platinum
   e. Grout: PermaColor.
   f. Silicone sealant, Lataseal,
3. Back butter all tiles.

3.5 INTERIOR WALL TILE INSTALLATION SCHEDULE

A. Interior Wall Installations:

1. Tile Installation W245: Medium-set mortar, TCNA W245 (over waterproofing membrane where indicated) over cement backer board
    a. Tile Type: Confirm compatibility of installation products with tile supplied.
        1) Refer to Drawings for Type
    b. Medium Set Mortar: Latex modified-portland cement mortar.
    c. Grout: Polymer modified grout.
2. Tile Installation W260: Medium-set mortar, TCNA W260(over waterproofing membrane where indicated) over cement backer board
    a. Tile Type: Large Format Tile. Confirm compatibility of installation products with tile supplied.
    b. Medium Set Mortar: Latex modified-portland cement mortar.
    c. Grout: Polymer modified grout.

B. Shower Receptor and Wall Installations:
1. Tile Installation: TCNA B419; thinset mortar on waterproof membrane over cementitious backer units or fiber-cement backer board.
    a. Thinset Mortar: Latex- portland cement mortar.
    b. Grout: High-performance unsanded grout.

C. Steam Shower:
1. Tile Installation: TCNA SR614; Thinset mortar on waterproof membrane over cementitious backer units or fiber-cement backer board.
    a. Thinset Mortar: Latex- portland cement mortar.
    b. Grout: High-performance unsanded grout.

3.6 GLASS INSTALLATION SCHEDULE

A. Confirm with manufacturers written installation instructions prior to installation.

B. Interior Wall Installation, Metal Studs or Furring;
1. Glass Tile Wall Installation: TCNA W242; organic adhesive on gypsum board.
    a. Grout: Unsand-portland cement grout.

END OF SECTION 093000

SECTION 096513 - RESILIENT WALL BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes Resilient base.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples: For each type of product indicated, in manufacturer's standard-size Samples but not less than 12 inches long, of each resilient product color, texture, and pattern required.

1.3 CLOSEOUT SUBMITTALS

A. Maintenance Data: For finish to include in maintenance manuals. Include the following:
   1. Methods for maintaining finish, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
   2. Precautions for cleaning materials and methods that could be detrimental to finish

1.4 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
   1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

1.5 PROJECT CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer in spaces to receive resilient products.

B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer.

C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 RESILIENT BASE

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include those listed as indicated on Finish Schedule.

B. Resilient Base Standard: ASTM F 1861.
   1. Material Requirement: Type TP (rubber, thermoplastic).
   2. Manufacturing Method: Group I (solid, homogeneous).
   3. Style: Straight

C. Minimum Thickness: 0.125 inch.

D. Height: As indicated on Drawings.

E. Lengths: Rolled, strips or pre-cut pieces will not be allowed.

F. Outside Corners: Job formed.

G. Inside Corners: Job formed.

2.2 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.

C. Metal Edge Strips: Extruded aluminum with mill finish of width shown, of height required to protect exposed edges of tiles, and in maximum available lengths to minimize running joints.

PART 3 - EXECUTION

3.1 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates for Accessories: Prepare according to ASTM F 710.
1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer.
4. Moisture Testing: Perform tests recommended by manufacturer and as follows. Proceed with installation only after substrates pass testing.
    a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
    b. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have maximum 75 percent relative humidity level measurement.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install resilient products until they are same temperature as the space where they are to be installed.
1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.

E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.2 RESILIENT BASE INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient base.

B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

C. Install resilient base without gaps at seams and with tops of adjacent pieces aligned.

D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

E. Do not stretch resilient base during installation.
   1. For treads installed as separate, equal-length units, install to produce a flush joint between units.

3.3 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protection of resilient products.

END OF SECTION 096513

SECTION 096519 - RESILIENT FLOORING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes
   1. Vinyl composition floor tiles.
   2. Underlayment.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For each type of floor tile. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.

C. Samples: Full-size units of each color and pattern of floor tile required.

D. Maintenance data.

1.3 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
   1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

1.4 PROJECT CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer in spaces to receive floor tile.

B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer.

C. Close spaces to traffic during floor tile installation.

D. Close spaces to traffic for 48 hours after floor tile installation.

E. Install floor tile after other finishing operations, including painting, have been completed.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. 5 percent, but not less than 10 tiles of each material and color and pattern.

PART 2 - PRODUCTS

2.1 MATERIALS GENERAL

A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, those listed on Drawings

2.2 LUXURY VINYL COMPOSITION FLOOR TILE
   1. Basis if Design: Defined Beauty by Mohawk Industries.

2. Construction: Rigid
3. Installation: Click
4. Overall Thickness: 5.5 inches.
5. Wear Layer: 12 mils.
6. Plank / Tile size: 7.25” x 4.8”
7. Color: As selected.
8. ADA Compliant, when tested according to ASTM C 1028

2.3 UNDERLAYMENT

A. Basis of Design: Acousti-Mat Premium as manufactured by Maxxon.
   1. Thickness: As indicated on Drawings

B. Accessory products: Provide products by same manufacturer as underlayment mat.
   1. Acousti-Mat Perimeter Isolation Strips.
   2. Acousti-Mat Tape.

2.4 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by manufacturer to suit floor tile and substrate conditions indicated.
   1. Products: Compliant with flooring manufacturer.
      a. Confirm product with flooring manufacturer based on result from moisture testing.

C. Integral-Flash-Cove-Base Accessories:
   1. Cove Strip: 1-inch radius provided or approved by manufacturer.

D. Floor Polish: Provide protective liquid floor polish products as recommended by manufacturer.

E. Metal Edge/Transition Strips: Extruded aluminum with satin finish of profile and width shown, of height required to protect exposed edge of carpet, and of maximum lengths to minimize running joints.
   1. Provide products as manufactured by Schluter
   2. Finish: Anodized Aluminum.

F. Floor Strips: As indicated in the Finish Legend.

G. Primer: As recommended by cement based underlayment manufacturer.

PART 3 - EXECUTION

3.1 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

B. Examine all substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work. Proceed with installation only after unsatisfactory conditions have been corrected.

C. Concrete Cast (underlayment) Substrates: Prepare according to ASTM F 710.
   1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
   2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.

3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
4. Moisture Testing: Perform tests recommended by floor covering manufacturer and as follows. Proceed with installation only after substrates pass testing.
    a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 5 lb of water/1000 sq. ft. in 24 hours.
    b. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 80 percent relative humidity level measurement.
5. Bond Tests as described in publication F-5061.

D. On installations where both the Percent Relative Humidity and the Moisture Vapor Emission Rate tests are conducted, results for both tests shall comply with the allowable limits listed above. Do not proceed with flooring installation until results of moisture tests are acceptable. All test results shall be documented and retained.

E. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.

F. Do not install floor tiles until they are same temperature as space where they are to be installed.
1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.

G. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.2 FLOOR TILE INSTALLATION

A. Comply with manufacturer's written instructions for installing floor tile.

B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
1. Lay tiles in pattern indicated.

C. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.

D. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.

E. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent, nonstaining marking device.

F. Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.3 FLOOR COVERING INSTALLATION

A. Comply with manufacturer's written instructions for installing floor coverings.

B. Unroll floor coverings and allow them to stabilize before cutting and fitting.

C. Lay out floor coverings as follows:
1. Maintain uniformity of floor covering direction.
2. Minimize number of seams; place seams in inconspicuous and low-traffic areas, at least 6 inches away from parallel joints in floor covering substrates.

3. Match edges of floor coverings for color shading at seams.
4. Avoid cross seams.

D. Scribe and cut floor coverings to butt neatly and tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, and door frames.

E. Extend floor coverings into toe spaces, door reveals, closets, and similar openings.

F. Maintain reference markers, holes, or openings that are in place or marked for future cutting by repeating on floor coverings as marked on substrates. Use chalk or other nonpermanent marking device.

G. Adhere floor coverings to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

H. Heat-Welded Seams: Comply with ASTM F 1516. Rout joints and heat weld with welding bead to permanently fuse sections into a seamless floor covering. Prepare, weld, and finish seams to produce surfaces flush with adjoining floor covering surfaces.

I. Integral-Flash-Cove Base: Cove floor coverings 6 inches up vertical surfaces. Support floor coverings at horizontal and vertical junction by cove strip. Butt at top against cap strip.

3.4 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protection of floor tile.

B. Floor Polish: Remove soil, visible adhesive, and surface blemishes from floor tile surfaces before applying liquid floor polish.
1. Apply recommended coat(s) by manufacturer.

C. Cover floor until Substantial Completion.

END OF SECTION 096519

SECTION 096816 - SHEET CARPETING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes tufted carpet

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Show the following:
1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet.
2. Carpet type, color, and dye lot.
3. Seam locations, types, and methods.
4. Pile direction.

C. Samples: For each exposed product and for each color and texture specified.

1.3 INFORMATIONAL SUBMITTALS

A. Product test reports.

B. Warrant: Sample of special warranty.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For finish to include in maintenance manuals. Include the following:
1. Methods for maintaining finish, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
2. Precautions for cleaning materials and methods that could be detrimental to finish

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. 2 linear yards.

1.6 QUALITY ASSURANCE

A. Preinstallation Conference: Conduct conference at Project site.

B. Installer Qualifications: An experienced Installer who is certified by the International Certified Floorcovering Installers Association at the Commercial II certification level.

C. Fire-Test-Response Ratings: Where indicated, provide carpet identical to those of assemblies tested for fire response per NFPA 253 by a qualified testing agency.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Comply with CRI 104.

1.8 FIELD CONDITIONS

A. Comply with CRI 104 for temperature, humidity, and ventilation limitations.

1.9 WARRANTY

A. Special Warranty for Carpet: Manufacturer agrees to repair or replace components of carpet installation that fail in materials or workmanship within specified warranty period.
   1. Warranty does not include deterioration or failure of carpet due to unusual traffic, failure of substrate, vandalism, or abuse.
   2. Failures include, but are not limited to, more than 10 percent loss of face fiber, edge raveling, snags, runs, loss of tuft bind strength, excess static discharge, <Insert failure characteristic> and delamination.
   3. Warranty Period: 10 <Insert number> years from date of Substantial Completion.

B. Special Warranty for Carpet Cushion: Manufacturer agrees to repair or replace components of carpet cushion installation that fail in materials or workmanship within specified warranty period.
   1. Warranty includes consequent removal and replacement of carpet and accessories.
   2. Warranty does not include deterioration or failure of carpet cushion due to unusual traffic, failure of substrate, vandalism, or abuse.
   3. Failure includes, but is not limited to, permanent indentation or compression.
   4. Warranty Period: 10 <Insert number> years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 TUFTED CARPET

A. Products: Subject to compliance with requirements, As indicated on the Drawings

2.2 INSTALLATION ACCESSORIES

A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet manufacturer.

B. Adhesives: Water-resistant, mildew-resistant, nonstaining type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet and is recommended or provided by carpet manufacturer.

C. Seam Adhesive: Hot-melt adhesive tape or similar product recommended by carpet manufacturer for sealing and taping seams and butting cut edges at backing to form secure seams and to prevent pile loss at seams.

D. Metal Edge/Transition Strips: Extruded aluminum with satin finish of profile and width shown, of height required to protect exposed edge of carpet, and of maximum lengths to minimize running joints.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet performance. Examine carpet for type, color, pattern, and potential defects.

B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

D. Preparation: Comply with CRI 104, Section 7.3, "Site Conditions; Floor Preparation," and with carpet manufacturer's written installation instructions for preparing substrates.

E. Installation: Comply with CRI 104 and carpet manufacturer's written installation instructions for the following:
   1. Direct-Glue-Down Installation: Comply with CRI 104, Section 9, "Direct Glue-Down Installation."

F. Comply with carpet manufacturer's written recommendations and Shop Drawings for seam locations and direction of carpet; maintain uniformity of carpet direction and lay of pile. At doorways, center seams under the door in closed position.

G. Cut and fit carpet to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet manufacturer.

H. Extend carpet into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

I. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, nonstaining marking device.

J. Install pattern parallel to walls and borders to comply with CRI 104, Section 15, "Patterned Carpet Installations" and with carpet manufacturer's written recommendations.

K. Comply with carpet cushion manufacturer's written recommendations.

L. Perform the following operations immediately after installing carpet:
   1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet manufacturer.
   2. Remove yarns that protrude from carpet surface.
   3. Vacuum carpet using commercial machine with face-beater element.

M. Protect installed carpet to comply with CRI 104, Section 16, "Protecting Indoor Installations."

END OF SECTION 096816

SECTION 099113 - EXTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes surface preparation and the application of paint systems on exterior substrates.

1.2 DEFINITIONS

A. Gloss Level 1 (Flat/Matte): Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.

B. Gloss Level 2 (Sheen Flat): Maximum of 10 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.

C. Gloss Level 3 (Eggshell): 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

D. Gloss Level 4 (Satin): 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.

E. Gloss Level 5 (Semi-Gloss): 35 to 70 units at 60 degrees, according to ASTM D 523.

F. Gloss Level 6 (Gloss): 70 to 85 units at 60 degrees, according to ASTM D 523.

G. Gloss Level 7 (High Gloss): More than 85 units at 60 degrees, according to ASTM D 523.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

B. Samples: For each type of paint system and each color and gloss of topcoat.

C. Product List: For each product indicated, for each product category specified, with the proposed product highlighted.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Paint: 5 percent, but not less than 1 gal. of each material and color applied.

1.5 QUALITY ASSURANCE

A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.
      a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft..
      b. Other Items: Architect will designate items or areas required.
   2. Final approval of color selections will be based on mockups.

a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to products listed on the Drawings for the paint category indicated.

2.2 PAINT, GENERAL

A. Material Compatibility:
1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

B. VOC Content: Provide materials that comply with VOC limits of authorities having jurisdiction.

C. Colors: As indicated in a color schedule.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
1. Concrete: 12 percent.
2. Wood: 15 percent.
3. Gypsum Board: 12 percent.

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Proceed with coating application only after unsatisfactory conditions have been corrected.
1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations applicable to substrates and paint systems indicated.

B. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

C. Steel Substrate: Remove rust and loose mill scale.
1. Blast clean according to SSPC-SP-6, “Commercial Blast Cleaning”.

D. Galvanized-Metal Substrates: Clean per SSPC-SP1 using detergent and water or a degressing cleaner to remove greases and oils. Apply test area, priming as required. Allow the coating to dry at least one week before testing. If Adhesion is poor, blast clean per SSPC-SP, “Commercial Blast Cleaning”.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and recommendations.

B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 CLEANING AND PROTECTION

A. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

B. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 EXTERIOR PAINTING SCHEDULE

A. Cast-In-Place Concrete Decorative Substrates:
1. High-Build Acrylic Coating
    a. Basis of Design: Products as manufactured by Tex-Cote Textured Coatings of America, Inc.
        1) Primer: Tex-Cote XL 70 W
        2) Topcoat: Tex-Cote 400
        3) Texture: Sand Texture

B. CMU and Concrete (Vertical) Substrates:
1. Elastomeric System
    a. Primer: A24W00200 - Loxon Masonry Coating System Block Surfacer White, (Apply at 50-100 sq ft/gal. 16 mils wet; to achieve 8 mils dry)
    b. Intermediate Coat: A05W00451 - ConFlex XL High Build Coating (Apply at 100-125 sq ft/gal. 13.0-16.0 mils wet; to achieve 6.0-7.5 mils dry)
    c. Topcoat: A05W00451 - ConFlex XL High Build Coating ((Apply at 100-125 sq ft/gal. 13.0-16.0 mils wet; to achieve 6.0-7.5 mils dry.) (2 coats recommended due to the typical porosity of these surfaces, not counting primer coat))
        1) A total dry film thickness of 12 - 15 mils of topcoat and a surface with 10 or less pinholes per square foot is required for a waterproofing system.
2. Latex System
    a. Egg-Shell Finish
        1) 1st Coat: S-W Loxon Concrete & Masonry Primer Sealer, A24W8300 (8.0 mils wet, 3.2 mils dry)
        2) 2nd Coat: S-W ProMar 200 Zero VOC Latex Eg-Shel, B20-2600 Series
        3) 3rd Coat: S-W ProMar 200 Zero VOC Latex Eg-Shel, B20-2600 Series (4.0 mils wet, 1.7 mils dry per coat)

C. Steel Substrates: Touch up for powder coating systems, provided by manufacturer of metal fabrications.

D. Metal Ferrous- (Structural Steel Columns, Joists, Trusses, Beams, Miscellaneous & Ornamental Iron, Sashes, Doors, Partitions)
1. Photoluminescent Pain, compliant with ASTM E 2073

a. 1st Coat:S-W Pro Industrial Pro-Cryl Universal Primer, B66-310 Series (5.0 mils wet, 2.0 mils dry)
b. 2nd Coat: S-W After Glow, color as selected.
c. 3rd Coat: S-W After Glow, Color as selected

2. Latex Systems
   a. Semi-Gloss Finish
      1) 1st Coat: S-W Pro Industrial Pro-Cryl Universal Primer, B66-310 Series (5.0 mils wet, 2.0 mils dry)
      2) 2nd Coat: S-W Pro Industrial Semi-Gloss Acrylic, B66-650 Series
      3) 3rd Coat: S-W Pro Industrial Semi-Gloss Acrylic, B66-650 Series (6.0 mils wet, 2.5 mils dry per coat)

E. Wood substrates, nontraffic surfaces.
   1. Stain & Varnish
      a. Clear Finish
         1) 1st Coat: S-W Wood Classics® 250 Oil Stain, A49-800 Series
         2) 2nd Coat: S-W Wood Classics Waterborne Polyurethane Varnish, Satin
         3) 3rd Coat: S-W Wood Classics Waterborne Polyurethane Varnish Satin (4.0 mils wet, 1.0 mil dry per coat)
   2. Latex Systems
      a. Semi-Gloss Finish
         1) 1st Coat: S-W Premium Wall & Wood Primer, B28W8111 (4.0 mils wet, 1.8 mils dry)
         2) 2nd Coat: S-W Pro Industrial Semi-Gloss Acrylic, B66-650 Series
         3) 3rd Coat: S-W Pro Industrial Semi-Gloss Acrylic, B66-650 Series (6.0 mils wet, 2.5 mils dry per coat)

F. Gypsum Board Substrates Soffits:
   1. Latex Systems
      a. Semi-Gloss Finish
         1) 1st Coat: S-W ProMar 200 Zero VOC Latex Primer, B28W2600 (4.0 mils wet, 1.0 mils dry)
         2) 2nd Coat: S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series (4.0 mils wet, 1.6 mils dry per coat)

END OF SECTION 099113

SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes surface preparation and the application of paint systems on interior substrates.

1.2 DEFINITIONS

A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.

B. Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

C. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

D. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.

E. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.

F. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.

G. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.3 ACTION SUBMITTALS

A. Sustainability Submittals:
1. Submit Health Product Declaration (HPD) demonstrating the chemical inventory of the product to at least 0.1% (1000 ppm).

B. Product Data: For each type of product. Include preparation requirements and application instructions.

C. Samples: For each type of paint system and in each color and gloss of topcoat.

D. Product List: For each product indicated.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Paint: 1 gal. of each material and color applied for purpose of touch up only.

1.5 QUALITY ASSURANCE

A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.

a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft..
b. Other Items: Architect will designate items or areas required.

2. Final approval of color selections will be based on mockups.
   a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to products listed on Drawings articles for the paint category indicated.

B. Preference shall be given to products that have a Health Product Declaration (HPD)

2.2 PAINT, GENERAL

A. MPI Standards: Provide products that comply with GPS-1-08 and GPS 2-08 approved product list.

B. Material Compatibility:
   1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
   2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

C. Colors: As indicated in a Finish Schedule

2.3 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:
   1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
   2. Testing agency will perform tests for compliance with product requirements.
   3. Owner may direct Contractor to stop applying coatings if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
   1. Thoroughly inspect trim and casing prior to the application of the first coat, touch up primer as required.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
   1. Concrete: 12 percent.
   2. Wood: 15 percent.

3. Gypsum Board: 12 percent.

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Proceed with coating application only after unsatisfactory conditions have been corrected.
1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. Inspect all surfaces after application of primer and prior to application of final coat.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions.

B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 CLEANING AND PROTECTION

A. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

B. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 INTERIOR PAINTING SCHEDULE

A. Refer to Drawings for Schedule

END OF SECTION 099123

SECTION 101400 - SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Plaques.
   2. Dimensional illuminated characters.
   3. Panel signs.
   4. Illuminated panel signs.

1.2 QUALITY ASSURANCE

A. Single source, obtain all products in this section from a single supplier.

B. Regulatory requirements: products shall meet requirements of the Americans with Disabilities Act Accessibility Guidelines (ADAGG) and local amendments and modifications.

C. Installer: installation shall be performed by installer specialized and experienced in work similar to that required for this project.

D. Quality of workmanship: the fabricator shall be responsible for the quality and delivery of all materials and workmanship required for the execution of the contract including the materials and workmanship of any firms or individuals who act as his sub-fabricators. Fabricators shall be responsible for providing sub-fabricators with complete and up-to-date drawings, specifications, graphic schedule, and other information issued by the designer.

E. Performance: the fabricator shall base his or her proposal on the performance of all services, including all items of labor, materials and equipment required for the complete fabrication and installation of the specified work within the time frame agreed.

F. Dimensions: written dimensions on the drawings shall take precedence over scaled dimensions. Fabricator shall verify and be responsible for all dimensions and conditions shown by these drawings.

G. Sign package graphics schedule:
   1. Copy and references shown on the graphics schedule shall take precedence over drawings.
   2. Specifications shall take precedence over the details and the details shall take precedence over the drawings.

H. Execution: fabricator shall notify designer/owner of any discrepancies in the drawings or graphic schedule, in field dimensions or conditions, and/or changes required in construction details. Problems such as messages being too long to fit into the required formats, difficult to reproduce accurately logo or logo-type components, etc., must be brought to the attention of designer/owner prior to execution. It is required that the fabricator not resolve any discrepancies without consulting Ekstrand Creative, LLC.

I. Fabricator recommendations: the fabricator shall carefully study the detailed drawings for the various signs and make specific recommendations and changes if those changes will improve the quality of any sign. Such recommendations and changes shall be approved in writing by designer/owner prior to preparation of shop drawings or fabrication of any samples of signs.

J. Artwork: electronic artwork as required by the fabricator for symbols or custom designed graphic components, i.e. logos, logo types, arrows or patterns will be provided in macos format as a scaled percentage of the final size. The appropriate eps art will also be provided where necessary. All typical copy layouts and text is the responsibility of the sign fabricator. All enlarging and reducing is the

responsibility of the sign fabricator. The awarded bid fabricator is to submit an itemized list of all required artwork.

K. UL compliance: complete UL compliance as required is the responsibility of the fabricator. Fabricator shall provide lighting fixtures and electrical components that are UL -labeled and listed and shall indicate locations and electrical service required for review by designer/owner unless noted otherwise. Fabricator is responsible for all final electrical connections.

L. Lamp emission: all lighting fixtures/sources shall emit a color balanced, consistent and uniform light with no browning, flickering, haloing, or other uneven effect.

M. Electrical hardware: all transformers and electrical hardware shall be concealed, non-audible and non-visible to pedestrian and vehicular traffic.

N. Labeling: there shall be no visible labels, manufacturer's or otherwise, code permitting, on the completed signs. If labels are required, a sample label and intended location along with an explanation of the requirement must be submitted for designer/owner review, prior to application and/or installation.

O. Stock: all materials, hardware, electrical components, finishes, etc. Used to fabricate any and all sign components shall be "new" (not previously used or operated in any other application) and from the most recent original manufacturer's production run/supply and appropriately matched to the service conditions required of the site.

P. Inspection: fabricator must examine the substrates and conditions under which the signs are to be installed and notify the designer in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the fabricator.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.

B. Deliver products in manufacturer's original, unopened, undamaged containers with identification labels intact.

C. Store products protected from weather, temperature, and other harmful conditions as recommended by supplier.

D. Handle products in accordance with manufacturer's instructions.

1.4 WARRANTY

A. Manufacturer's warranty: submit manufacturer's standard warranty document executed by authorized company official.
   1. Warranty Period: 18 Months year from product ship date. Warranty specifically excludes letter mounting substrate.

B. Finish surfaces: sign units shall be warranted in writing by the fabricator for a period of no less than one year from the date of finished installation. There shall be:
   1. No delamination of any parts of the sign or of lettering from the sign face.
   2. No cupping, warping or dishing in excess of the requirements stipulated in the specifications
   3. No bubbling, crazing, chalking, rusting, or other disintegration of the sign face, messages or edge finish of the panels.
   4. No corrosion developing beneath the paint surface of the support systems - except as the result of obvious vandalism or other external damage of those paint surfaces.

5. No corrosion of the fastenings.
6. No fading of the colors when matched against a sample of the original color and material.
7. No variation of any other performance specified on the drawing or in the specifications.

C. Structure / components: signage fabricator shall provide owner with written warranty prior to installation guaranteeing to correct, to owner's satisfaction, at sign fabricator's sole expense, all defects in fabrication and installation of signage work for a period of one year after completed installation of signage work.

D. External lamps: all lamps shall be warranted against failure for 90 days, all neon three years and all ballast one year. In the event of failure within specified times these items are to be replaced by fabricator at fabricator's sole expense.

E. Security: fabricator shall have total and complete responsibility for the security of all equipment, materials, and sign components until reviewed and accepted by the designer/owner.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Acrylic / color translucent sheet: where sheet material is indicated as a "color" provide color translucent sheet of density required to produce uniform brightness without halo-like effect. Material provided shall be appropriately matched to the intended permanent field conditions.

B. Acrylic/transparent sheet: where sheet material is indicated as "clear" provide colorless sheet in gloss finish, with light transmittance of 92 percent, where tested in accordance with the requirements of ASTM D-1103.

C. Aluminum sheet: provide aluminum sheet of alloy and temper recommended by the aluminum producer or finisher for the type of use and finish indicated and with not less than the strength and durability properties specified in ASTM B109 for 5005-h15.

D. Aluminum extrusions: provide aluminum extrusions of alloy and temper recommended by the aluminum producer or finisher for the type of use and finish indicated and with not less than the strength and durability properties specified in ASTM B-221 for 6063-t5.

E. Structural steel: provide internal structural steel as required to meet the requirements of the permanent installation.

F. Fasteners: unless otherwise indicated, provide concealed fasteners fabricated from metals that are non-corrosive to either the signage materials or the mounting surface.

G. Electrical/lamps: provide new electrical components and respective lamps, so as to be easily repaired or replaced from local available stock (24 hr. Max. Turn-around).

H. Vinyl machine cut copy: vinyl machine cut copy shall be of 3m scotchcal brand film or approved equal.

I. Paint: paint shall be highest grade for best ultraviolet light resistance, weatherability, and overall longevity of finish and color. Paint shall have a written warranty against premature fading and be approved by designer / owner prior to construction. Prior to close-out, fabricator to turn over to designer / owner complete paint schedule indicating colors used on each sign type and turn over new unopened gallon containers of each paint color/finish used on signs.

2.2 FABRICATED METAL LETTERS.

A. General: comply with requirements indicated for materials, thicknesses, finishes, colors, designs, shapes, and sizes. Fabricate, and install sign assemblies to prevent buckling, opening up of joints, and over-

stressing of welds and fasteners. Mill joints to a tight, hairline fit. Form joints exposed to the weather to exclude water penetration.

B. Fabricated letters:
1. Letter Material & Size: Refer to signage drawings for sizes, locations, and layout of signage types, typical sign text copy, and graphics.
2. Logo: Digital ready art of logo.
3. Mounting method: projecting mount.

2.3 CUT METAL LETTERS.

A. General: comply with requirements indicated for materials, thicknesses, finishes, colors, designs, shapes, sizes, and details of construction

B. Cut metal letters:
1. Letter Material: Refer to signage drawings for sizes, locations, and layout of signage types, typical sign text copy, and graphics.
2. Size: 6 inches
3. Mounting Method: Flush Mount and/or Projected, refer signage drawings
4. Finish: Refer to Drawings
   a. Unit Numbers: Photoluminescent paint, refer to Division 09 Section “Exterior Painting”

2.4 PHOTOPOLYMER BONDED TO ACRYLIC BACKING PLAQUE

A. General: photopolymer signs offer a variety of standard and custom sizes, shapes, and appearance options, all fabricated using a photopolymer bonded to an acrylic backing plaque to create projected graphics.
1. Braille must be used to identify all permanent rooms and spaces.

B. Sign materials
1. Face: Photopolymer Face, in matte (non-glare) finish.
2. Backing plate: acrylic.

C. Fabrication options
1. Letter Material & Size: Refer to signage drawings for sizes, locations, and layout of signage types, typical sign text copy, and graphics.
2. Tactile graphics and text:
   a. Provide tactile copy and grade 2 Braille raised 1/32 inch minimum from plaque first surface by manufacturer’s photopolymer bonded process. Signface of single material, tactile characters and Braille integral to photopolymer. Adhesive-fixed characters are not acceptable.
   b. Provide lettering and graphics precisely formed, uniformly opaque to comply with relevant ADA regulations and requirements indicated for size, style, spacing, content, position, and colors. Tactile characters to be raised min. 1/32” from surface. Computerized translation of sign copy to be responsibility of the manufacturer.

D. Installation method
1. Vinyl tape.
2. Silicone adhesive.
3. Mounting holes for stud mounted mechanical fasteners.

2.5 FABRICATION

A. General: comply with requirements indicated for materials, thicknesses, finishes, colors, designs, shapes, sizes, and details of construction.

1. Design, fabricate, and install sign assemblies to prevent buckling, opening up of joints, and over-stressing of fasteners.
2. Mill joints to a tight, hairline fit.
3. Conceal fasteners if possible; otherwise, locate fasteners where they will be inconspicuous.
4. Create signage to required sizes and layout. Comply with requirements indicated for design, dimensions, finish, color, and details of construction.

B. Copy application: provide sign copy to comply with the requirements indicated for sizes, styles, spacing, content, positions, materials, finishes, and color of letters, numbers, symbols and other graphic devices.
1. Two methods of copy application are acceptable:
   a. Screen printing
   b. Fabricated vinyl machine cut, pre-spaced letters

C. Illumination: illuminate units in the manner indicated using the manufacturer's standard lighting components including fluorescent, incandescent and/or neon, fixtures, transformers, insulators and other components. Make provisions for servicing and for concealed connection to the building system . Coordinate the electrical characteristics of signs with those of the power supply provided.

D. Sign cabinet: details shown on the drawing shall be followed for exterior appearance. Structural design shall utilize unitized, self-supportive framing. Fabricate cabinet, exposed faces and graphic devices to size and style indicated and produce surfaces free from oil canning, warping, distortion or any irregularities or inconsistencies. Include internal bracing for stability and attachment of mounting accessories as required. Fabricator may change interior construction shown on these details to conform with his shop practices. However, these changes must be submitted as part of the shop drawings and be approved by designer/owner prior to fabrication.

E. Fastenings
1. Fastenings on sign-face surface shall not be exposed, except where noted.
2. Sign-face surfaces shall not be penetrated during fabrication or installation of signs, except where noted.
3. Sign-face surface shall not be deformed, distorted, or discolored by attachment of concealed fastenings.
4. All fastenings shall be resistant to oxidation or other corrosive action completely through their cross sections.
5. Work shall be secured with fastenings of the same color and finish as the components they secure where they are exposed to view.
6. Fabrication work with fastenings shall be utilized in strict accordance with their manufacturer's specifications, directions, recommendations and as indicated on design intent drawings.

F. Neon / lamps: all exposed neon shall be installed in such a manner as to minimize double backs, exposed wires, etc. All exposed neon shall appear as a continuous line (4'0" min. Seamless runs) of light with no irregularities from section to section. All exposed neon returns and double backs are to be opaque with a top coat to match the field area immediately behind that neon. Fabricator shall coordinate with designer/owner to choose exact color of neon and/or lamps.

G. Aluminum sheet: not less than 0.125" thick unless noted otherwise. Fabricate by the heliarc or mig welding process with all visible seams continuously welded, filled and ground smooth, unless the seam occurs along a color break. Then a clean butt joint with concealed backing channel and plug weld is acceptable upon receipt of designer approved sample to match surrounding material finish. All blinds, curves and folds to be geometrically correct and produced by a consistent mechanical method unless approved otherwise by designer/owner.

H. Jointing and brake forming: all sheet metal shall have brake formed edges with radii not greater than sheet thickness unless otherwise specified. Adjacent stock shall have edges with similar radii.

2.6 FINISHES

A. Colors and surface textures: all colors shall match exactly the color specifications provided by designer. For exposed signage, materials with applied colors or other characteristics related to appearance, provide color matches indicated, or if not indicated, as selected and reviewed by designer/owner.

B. Surface preparation: all surfaces shall be thoroughly cleaned and free from dust, dirt, rust, scale, mill scale, oil, greasy materials, or residue from cleaning. All structural metals shall be cleaned by sandblasting. All coatings shall be applied in strict accordance with the manufacturer's recommendations. All paint products shall conform to local codes. All finishes shall present a uniform opaque color appearance unless specifically indicated otherwise by designer/owner.

C. Application: all applications of color/coatings are to be equal and of consistent covering with no "streaking", "spotting", "gradation" or other variations within and from each similar application.

D. Ultra-violet/fading protection: fabricator shall utilize materials, coatings, and processes to minimize as much as possible any noticeable fading of pigmented coatings.

2.7 PAINTED FINISH

A. Ferrous surfaces: all metal surfaces to be painted shall be primed with a primer recommended by the paint manufacturer. Primer shall be applied in direct accordance with manufacturer's specifications.

B. Aluminum: all aluminum to be paint finished shall be primed with a zinc chromate primer in two coats for a total of three mill dft.

C. Plastic surfaces: all plastic to be paint finished according to paint manufacturer's specifications.

D. Wall surfaces: all wall surfaces to be paint finished shall be properly primed with product specific to wall type (concrete block, precast concrete etc) and finished with a polyurethane paint product.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Site verification of conditions: verify installation conditions previously established under other sections are acceptable for product installation in accordance with manufacturer's instructions.

B. Scheduling of installation by owner or it’s representative implies that substrate and conditions are prepared and ready for product installation. Proceeding with installation implies installer’s acceptance of substrate and conditions.

3.2 INSTALLATION

A. Install product in accordance with supplier’s instructions.

B. Install product in locations indicated using mounting methods recommended by sign manufacturer and free from distortion, warp, or defect adversely affecting appearance.

C. Install product level, plumb, and at heights indicated.

D. Install signs within the following tolerances and in accordance with manufacturer's recommendations:
1. Interior Signs: Within 1/4 inch vertically and horizontally of intended location.
2. Exterior Signs: Within 1 inch vertically and horizontally of intended location.

E. Signage fabricator shall be responsible for determining the erection and dismantling of all barricade or protective coverings necessary to safeguard the public and property during the performance and duration of his work.

F. All electrical connections shall be made by a licensed electrician employed by the fabricator for this purpose. All connections shall be made in accordance with the requirements of the local jurisdiction in addition to all applicable local codes. Electrical fabricator shall provide and install all wiring, conduit, junction boxes, and electrical devises necessary to provide electrical power to rough-in connections. Signage fabricator shall provide remote concealed neon transformers and all electrical connections beyond rough-in connections by electrical fabricator, according to approved methods.

G. Fabricator shall be responsible for matching electrical service available on site to the requirements of the sign, including transformers.

H. Fabricator must coordinate all items including installation with general contactor as required so that overall project schedule is not impacted.

I. Installation of all signage items shall be by the sign fabricator. Installation includes provision of any required footings, all anchor bolts, fastenings, attachment metals, and other miscellaneous metal items imbedded in concrete or building wall material as required, and security of sign units in place with no visible fasteners unless noted otherwise.

J. Any purpose for which the use of cranes or other heavy equipment becomes necessary, the general contractor’s heavy equipment and/or cranes maybe available for use by sign fabricator. Fabricator shall coordinate scheduling and use of equipment with the general contractor. Otherwise fabricator shall be responsible for all heavy equipment and cranes as necessary.

3.3 CLEANING, PROTECTION, AND REPAIR

A. All items to be installed under the signage fabricator shall be left in a clean and orderly condition. Upon completion of the installation of each sign structure, clean all soiled sign surfaces in accordance with the manufacturer’s instructions and touch up as required. All debris and packing material shall be removed and disposed of, except for the removal of protective masking from plexiglas surfaces which shall be removed by the fabricator upon completion of installation. All excavation and site work shall be returned to its original grade configuration after contract items are installed.

B. Repair scratches and other damage which might have occurred during installation. Replace components where repairs were made but are still visible to the unaided eye from a distance of:
1. Interior: 3 feet
2. Exterior: 10 feet.

C. Remove temporary coverings and protection to adjacent work areas. Clean installed products in accordance with manufacturer's instructions prior to owner's acceptance. Remove construction debris from project in accordance with provisions in division 1.

3.4 SIGN DESIGN LAYOUT

A. Refer to signage drawings for sizes, locations, and layout of signage types, sign text copy, and graphics.

END OF SECTION 101400

SECTION 102800 - TOILET AND BATH ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Public and office bathroom room accessories.
   2. Custodial accessories.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Product Schedule:
   1. Identify locations using room designations indicated on Drawings.
   2. Identify products using designations indicated on Drawings.

1.3 QUALITY ASSURANCE

A. Source Limitations: For products listed together in the same Part 2 articles, obtain products from single source from single manufacturer.

B. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA) and Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities" and ICC/ANSI A117.1 for toilet compartments designated as accessible.

C. Provide documentation that hand dryer qualify for the EPA/DOE ENERGY STAR product labeling program.

1.4 COORDINATION

A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

PART 2 - PRODUCTS

2.1 ACCESSORIES

A. Available Manufacturers: Subject to compliance with requirements, provide products listed on the Toilet Accessories Schedule on Drawings, provide the following in addition to those items indicated on the Drawings;
   1. Robe hook
   2. 24 inches towel bar
   3. Hand towel ring
   4. Toilet paper dispenser
   5. Shower curtain rod

B. Finish: As indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

B. Grab Bars: Install to withstand a downward load of at least 250 lbf, when tested according to ASTM F 446.

3.2 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.

B. Remove temporary labels and protective coatings.

C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

END OF SECTION 102800

SECTION 104416 - FIRE EXTINGUISHERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes portable, hand-carried fire extinguishers.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Operation and maintenance data.

C. Warranty: Sample of special warranty.

1.3 QUALITY ASSURANCE

A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."

B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.

C. Coordinate type and capacity of fire extinguishers with fire protection cabinets to ensure fit and function.

1.4 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Failure of hydrostatic test according to NFPA 10.
      b. Faulty operation of valves or release levers.
   2. Warranty Period: Six years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

A. Fire Extinguishers: Type, size, and capacity for under counter storage in each unit.
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      a. Amerex Corporation.
      b. J. L. Industries, Inc.; a division of Activar Construction Products Group.
      c. Larsen's Manufacturing Company.
   2. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B and bar coding for documenting fire extinguisher location, inspections, maintenance, and recharging.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Examine fire extinguishers for proper charging and tagging.

1. Remove and replace damaged, defective, or undercharged fire extinguishers.

B. Install fire extinguishers in locations indicated and in compliance with requirements of authorities having jurisdiction.

END OF SECTION 104416

SECTION 113100 - RESIDENTIAL APPLIANCES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Cooking appliances.
2. Kitchen exhaust ventilation.
3. Refrigeration appliances.
4. Dishwasher.
5. Unit washer pan.
6. Garbage disposal.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.
1. Appliances; Install Energy Star-labeled clothes washers, dishwashers, and refrigerators.

B. Samples: For each exposed product and for each color and texture.

C. Product certificates.

D. Field quality-control reports.

E. Operation and maintenance data.

F. Warranties: Sample of special warranties.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer for installation and maintenance of units required for this Project.

B. Preinstallation Conference: Conduct conference at Project site.

1.4 WARRANTY

A. Special Warranties: Manufacturer's standard form in which manufacturer agrees to repair or replace residential appliances or components that fail in materials or workmanship within specified warranty period.
1. Warranty Period: Manufacturers standard.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, those listed on Drawings.

B. Color: As indicated on Drawings.

C. Washing machine pan, refer to Drawings.
1. Provide nylon braided hoses, refer to Plumbing Drawings.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Built-in Equipment: Securely anchor units to supporting cabinets or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and that rough openings are completely concealed.

B. Freestanding Equipment: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.

C. Range Anti-Tip Device: Install at each range according to manufacturer's written instructions.

D. Utilities: See Divisions 22 and 26 for plumbing and electrical requirements.

3.2 FIELD QUALITY CONTROL

A. Perform tests and inspections.
   1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

B. Tests and Inspections:
   1. Perform visual, mechanical, and electrical inspection and testing for each appliance according to manufacturers' written recommendations. Certify compliance with each manufacturer's appliance-performance parameters.
   2. Leak Test: After installation, test for leaks. Repair leaks and retest until no leaks exist.
   3. Operational Test: After installation, start units to confirm proper operation.
   4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and components.

C. Prepare test and inspection reports.

3.3 APPLIANCE SCHEDULES

Equipment Apartment Schedule

Type Mark	Description	Manufacturer	Model
ADW1	Dishwasher	LG	LDF5545ST
AR-1	Refrigerator	LG	LFDS22520S
ARM-1	Range / Microwave	LG	LRE3085ST / LMV1831ST
AWD1	Stackable Washer dryer	LG	WKEX200HBA

Equipment Condo Schedule

Type Mark	Description	Manufacturer	Model
CDW1	Dishwasher	Cove	DW2450WS
CF1	Fire Place	Flare Fireplaces	FLARE-FF-50EH
CF2	Outdoor Fire Place	Flare Fireplaces	FLARE-FF-60EH
CG1	Outdoor Drop In Grill	Wolf	OG42
CH1	Range Hood		
CM1	Microwave	Wolf	MDD30PE/S/PH
CR1	Refrigerator	Subzero	BI-42SID/O Custom wood panels kits ADD ALT: BLUESTAR BBBF361
CR2	Outdoor Undercounter Refrigerator	Subzero	UC-24RO
CRA1	Range	Wolf	GR486C ADD ALT: BLUESTAR RNB486CBV2
CW1	Undercounter Wine Storage	Subzero	UW-24/5
CW2	Undercounter Wine Storage	Subzero	UW-24/5
CWD1	Washer/ Dryer	LG	WM9000HVA_WD200CV _DLEX9000V_WDP5V

END OF SECTION 113100

SECTION 122113 - HORIZONTAL LOUVER BLINDS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes horizontal louver blinds.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Show fabrication and installation details for horizontal louver blinds.

C. Samples: For each exposed product and for each color and texture specified.

1.3 INFORMATIONAL SUBMITTALS

A. Product certificates.

B. Product test reports.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance data.

PART 2 - PRODUCTS

2.1 HORIZONTAL LOUVER BLINDS

A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, those listed on Drawings.
   1. Width: 2 inch
   2. Thickness: Not less than 0.006 inch
   3. Spacing: Manufacturer's standard.
   4. Finish: Faux wood.

B. Headrail:
   1. Manual Lift Mechanism:
      a. Lift-Cord Lock: Variable; stops lift cord at user-selected position within blind full operating range.
      b. Operator: Extension of lift cord(s) through lift-cord lock mechanism to form cord pull.
   2. Manual Tilt Mechanism: Enclosed worm-gear mechanism and linkage rod that adjusts ladders.
      a. Tilt: Full.
      b. Operator: Clear-plastic wand.
   3. Manual Lift-Operator and Tilt-Operator Lengths: Manufacturer's standard.
   4. Manual Lift-Operator and Tilt-Operator Locations: Manufacturer's standard unless otherwise indicated.

C. Bottom Rail: Matching slats.
   1. Type: Bottom contoured to minimize light gaps.

D. Valance: Manufacturer's standard.

E. Mounting Brackets: With spacers and shims required for blind placement and alignment indicated.

1. Type: Overhead.
2. Intermediate Support: Provide intermediate support brackets to produce support spacing recommended by blind manufacturer for weight and size of blind.

F. Hold-Down Brackets and Hooks or Pins: Manufacturer's standard.

G. Side Channels and Perimeter Light Gap Seals: Manufacturer's standard.

H. Colors, Textures, Patterns, and Gloss:
1. Slats: As selected by Architect from manufacturer's full range.
2. Components: Provide rails, cords, ladders, and materials exposed to view matching or coordinating with slat color unless otherwise indicated.

2.2 HORIZONTAL LOUVER BLIND FABRICATION

A. Product Safety Standard: Fabricate horizontal louver blinds to comply with WCMA A 100.1 including requirements for corded, flexible, looped devices; lead content of components; and warning labels.

B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at 74 deg F:
1. Between (Inside) Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which blind is installed less 1/4 inch per side or 1/2 inch total, plus or minus 1/8 inch. Length equal to head-to-sill dimension of opening in which blind is installed less 1/4 inch, plus or minus 1/8 inch.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, [locations of connections to building electrical system,] and other conditions affecting performance.
1. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Install horizontal louver blinds level and plumb, aligned and centered on openings, and aligned with adjacent units according to manufacturer's written instructions.
1. Locate so exterior slat edges are not closer than 1 inch from interior faces of glass and not closer than 1/2 inch from interior faces of glazing frames through full operating ranges of blinds.
2. Install mounting and intermediate brackets to prevent deflection of headrails.
3. Install with clearances that prevent interference with adjacent blinds, adjacent construction, and operating hardware of glazed openings, other window treatments, and similar building components and furnishings.

C. Adjust horizontal louver blinds to operate free of binding or malfunction through full operating ranges.

D. Clean horizontal louver blind surfaces after installation according to manufacturer's written instructions.

END OF SECTION 122113

SECTION 123530 - PREMANUFACTURED CASEWORK

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Unit Kitchen cabinets.
   2. Unit Vanity cabinets.

1.2 SUBMITTALS

A. Product Data: For the following:
   1. Cabinets.
   2. Cabinet hardware.

B. Shop Drawings: For cabinets. Include plans, elevations, details, and attachments to other work. Show materials, finishes, filler panels, hardware, edge and backsplash profiles, methods of joining countertops, and cutouts for plumbing fixtures.

C. Samples: For each type of material exposed to view.

D. Qualification Data: For qualified manufacturer.

1.3 WARRANTY

A. Provide hardware manufacturers standard minimum 5 year warranty.

PART 2 - PRODUCTS

2.1 MATERIAL GENERAL

A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, those listed on Finish Legend.
   1. Style: Flat flush door
   2. Species: As indicated.
   3. Finish: As indicated.

2.2 CABINET HARDWARE

A. General: Manufacturer's standard units complying with BHMA A156.9, of type, size, style, material, and finish as selected by Architect from manufacturer's full range.
   1. Finish: As indicated.
   2. Refer to Drawings.

B. Hinges: Concealed European-style soft-closing hinges, allowing 110 degree open.

C. Drawer Guides: Epoxy-coated-metal, soft-closing drawer guides; designed to prevent rebound when drawers are closed; with nylon-tired, ball-bearing rollers; and complying with BHMA A156.9, Type B05011 or B05091.

2.3 FABRICATION

A. Frameless European Construction:

1. Finishes:
   a. Exposed Surfaces (frame, doors, shelving): Stain, color as indicated.
   b. Semi Exposed Surfaces (Inside of cabinet): Melamine, white
      1) Sides: ¾ inch MDF core
      2) Back: ¼ inch MDF core
   c. Concealed Surfaces: Manufacturers standard.
2. Face Frame: Fasteners must not be visible on exposed parts.
3. Doors: ¾ inches.
   a. 1/16 inch reveal on all edges and 1/8 inch reveal between pair doors
4. Upper Cabinets:
   a. Box construction doweled together
   b. ¼ inch back dadoed into ends, top and bottom.
   c. ½ inch nail strips mounted to top and bottom
   d. System holes at 32 mm intervals with 5mm nickel shelf pins and acrylic supports
   e. ¾ inch shelving.
5. Lower Cabinets:
   a. Box construction doweled together.
   b. Drawers: Solid wood 5/8 inch dovetail boxes.
      1) Species: White birch
6. Toe Kick: ¼ inch, finish to match cabinet
7. Cabinet Doors for ADA Adaptable Sink Base
   a. Shall create ability to convert the open space for wheelchair access into additional storage space.
   b. Attachment of doors and conversion of plumbing close-off panel to floor shall not require plumbing modifications or disassembly.
   c. Doors shall detach and store within the plumbing close-off panel when conversion back to open space is required.

2.4 ACCESSORIES

A. Adhesives for countertops, as recommended by fabricator.

B. Stone Sealer; Colorless, stain-resistant sealer that does not affect color or physical properties of stone surfaces, as recommended by stone producer for application indicated.

2.5 OUTDOOR CABINETS

A. Basis of Design: Subject to project requirements, provide products by Weatherstrong, and Ideal Cabinetry company.
   1. Construction: All-Weatherboard composite material.
   2. Hardware: Stainless steel, soft close.
   3. Door styles, colors and hardware styles to be selected by Architect from Manufacturer’s full line.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install cabinets with no variations in flushness of adjoining surfaces; use concealed shims. Where cabinets abut other finished work, scribe and cut for accurate fit. Provide filler strips, scribe strips, and moldings in finish to match cabinet face.

B. Install cabinets without distortion so doors and drawers fit openings, are aligned, and are uniformly spaced. Complete installation of hardware and accessories as indicated.

C. Install cabinets and countertop level and plumb to a tolerance of 1/8 inch in 8 feet.

D. Fasten cabinets to adjacent units and to backing.
   1. Fasten wall cabinets through back, near top and bottom, at ends and not less than 24 inches o.c., with toggle bolts through metal backing behind gypsum board.

E. Fasten solid surface countertops by screwing through corner blocks of base units into underside of countertop. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

F. Complete cutouts not finished in shop. Mask areas of countertops adjacent to cutouts to prevent damage while cutting. Use power saws with diamond blades to cut stone. Make cutouts to accurately fit items to be installed, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.

G. Adjust cabinets and hardware so doors and drawers are centered in openings and operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.

H. Clean installed products in accordance with manufacturer’s instructions prior to Owner’s acceptance.

END OF SECTION 123530

SECTION 123661 - SOLID SURFACE COUNTERTOPS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes solid surface material countertops.

1.2 ACTION SUBMITTALS

A. Product Data: For countertop materials.
   1. Wood products, indicating compliance with requirements for low-emitting materials.
   2. Composite Wood: Provide manufacturer’s product data indicating that product is California 93120 CARB II.
   3. Include statement indicating the VOC content of field applied adhesives, sealants, paints and coatings, Submit manufacturer’s product data or Material Safety Data Sheet (MSDS) showing VOC content in grams per liter (g/L).

B. Shop Drawings: For countertops. Show materials, finishes, edge and backsplash profiles, methods of joining, and cutouts for plumbing fixtures.

C. Samples: For each type of material exposed to view.

PART 2 - PRODUCTS

2.1 SOLID SURFACE COUNTERTOP MATERIALS

A. Solid Surface Material: Homogeneous-filled plastic resin complying with ICPA SS-1.
   1. Basis of Design: As indicated on Drawings.
   2. Type: Provide Standard type unless Special Purpose type is indicated.
   3. Integral Sink Bowls: Comply with CSA B45.5/IAPMO Z124.
   4. Colors and Patterns: As selected by Architect from manufacturer's full range.

B. Particleboard: ANSI A208.1, Grade M-2-Exterior Glue..
   1. Provide composite wood products that are California 93120 CARB II compliant

C. Plywood: Exterior softwood plywood complying with DOC PS 1, Grade C-C Plugged, touch sanded.
   1. Provide composite wood products that are California 93120 CARB II compliant

2.2 COUNTERTOP FABRICATION

A. Fabricate countertops according to solid surface material manufacturer's written instructions and to the AWI/AWMAC/WI's "Architectural Woodwork Standards."
   1. Grade: Premium.

B. Configuration:
   1. Front: Straight, slightly eased at top

2. Backsplash: Straight, slightly eased at corner.
3. End Splash: Matching backsplash.

C. Horizontal Surfaces: 3/4-inch- thick, solid surface material.

D. Vertical Surfaces: 1/2-inch-thick, solid surface material.

E. Joints: Fabricate countertops without joints.

F. Cutouts and Holes:
1. Undercounter Plumbing Fixtures: Make cutouts for fixtures in shop using template or pattern furnished by fixture manufacturer. Form cutouts to smooth, even curves.

2.3 INSTALLATION MATERIALS

A. Adhesive: Product recommended by solid surface material manufacturer.
1. VOC Content (adhesives, sealants): Refer to Division 01 Section “Sustainability Design Requirements”.

B. Sealant for Countertops: Comply with applicable requirements in Section 079200 "Joint Sealants."

PART 3 - EXECUTION

3.1 INSTALLATION

A. Fasten countertops by screwing through corner blocks of base units into underside of countertop. Predrill holes for screws as recommended by manufacturer.

B. Fasten subtops to cabinets by screwing through subtops into cornerblocks of base cabinets. Shim as needed to align subtops in a level plane.

C. Secure countertops to subtops with adhesive according to solid surface material manufacturer's written instructions.

D. Bond joints with adhesive and draw tight as countertops are set. Mask areas of countertops adjacent to joints to prevent adhesive smears.

E. Install backsplashes and end splashes by adhering to wall and countertops with adhesive.

F. Install aprons to backing and countertops with adhesive.

G. Complete cutouts not finished in shop. Mask areas of countertops adjacent to cutouts to prevent damage while cutting. Make cutouts to accurately fit items to be installed, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.

H. Apply sealant to gaps at walls; comply with Section 079200 "Joint Sealants."

END OF SECTION 123661

EXHIBIT ___
PAYMENT BOND

Bond No._____

KNOW ALL MEN BY THESE PRESENTS: that

(Firm)_____

(Address)_____
(an Individual), (a Partnership), (a Corporation), hereinafter referred to as "the Principal", and

(Firm)_____

(Address)_____

hereinafter referred to as "the Surety", are held and firmly bond unto the Town of Frisco, Colorado, a municipal corporation, hereinafter referred to as "the Owner", in the amount of _____ Dollars in lawful money of the United States, whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, to the Owner to pay for labor, materials and equipment furnished for use in the performance of that Construction Agreement with the Owner, dated the ____ day of _____, 20___, for the performance of certain Work (the "Construction Contract"), which is by reference made a part hereof,

NOW, THEREFORE, if the Principal shall make payment to all persons, firms, subcontractors and corporations furnishing materials for or performing labor in the prosecution of the work provided for in the Construction Contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, repairs on machinery, equipment and tools, consumed, rented or used in connection with the construction of such work, and all insurance premiums on said work, and for all labor performed in such work, whether by subcontractor or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER,

1. That Surety shall have no obligation to Claimants under this Bond until:

1.1 Claimants who are employed by or have a direct contract with Contractor have given notice to Surety and sent a copy, or notice thereof, to the Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.

1.2 Claimants who do not have a direct contract with Contractor:

1.2.1 Have furnished written notice to Contractor and sent a copy, or notice thereof to Owner, up to and including the date of final settlement under the Construction Contract, stating with substantial accuracy the amount of the claim and the name of the party to whom materials were furnished or supplied or for whom labor was done or performed; and

1.2.2 Have either received a rejection in whole or in part from Contractor, or not received within 30 days of furnishing the above notice any communication from Contractor by which Contractor has indicated the claim will be paid directly or indirectly; and

1.2.3 Not having been paid within the above 30 days, have sent a written notice to Surety and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to Contractor.

2. If a notice required by Section 1 is given by Owner to Contractor or to Surety, that is sufficient compliance.

3. When a Claimant has satisfied the conditions of paragraph 1, Surety shall promptly and at Surety's expense take the following actions:

3.1 Send an answer to the Claimant, with a copy to Owner, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

3.2 Pay or arrange for payment of any undisputed amounts.

4. Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by Surety.

5. Amount owed by Owner to Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under the Construction Performance Bond. By Contractor's furnishing and Owner's accepting this Bond, they agree that all funds earned by Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of Contractor and Surety under this Bond, subject to Owner's priority to use the funds for the completion of the Work.

6. Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

7. Surety hereby waives notice of any change, including changes to the Construction Contract or to related subcontracts, purchase orders and other obligations.

8. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located and shall be instituted within two years after Owner declares Contractor to be in default or within two years after Contractor ceased working or within two years after Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to Sureties in the State of Colorado shall be applicable.

9. Any notice to the parties required under this Bond shall be in writing, delivered to the person designated below for the parties at the indicated address unless otherwise designated in writing. Only mailing by United States mail or hand-delivery shall be utilized. Facsimile and e-mail addresses may provided for convenience only.

OWNER: The Town of Frisco
Project Manager:
P.O. Box 4100
Frisco, CO 80443

PRINCIPAL: _____
_____
_____
_____

SURETY: _____
_____
_____
_____

10. This Bond is to be governed by the laws of the State of Colorado.

11. Upon request by any person or entity appearing to be a potential beneficiary of this Bond, Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

12. Definitions.

12.1 Claimant: Any person, partnership, or corporation, or other entity that has furnished labor, materials, team hire, sustenance, provisions, provender, or other supplies used or consumed by Contractor or its Subcontractor in or about the performance of the Work under the Construction Contract, or that supplies laborers, rental machinery, tools, or equipment to the extent used in the prosecution of the Work, or architectural and engineering services required for performance of the Work of the Contractor and the Contractor's Subcontractors.

12.2 Default: Failure of the Contractor or Owner, as the case may be, that has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Construction Contract.

IN WITNESS WHEREOF, this instrument is executed in five (5) counterparts, each one of which shall be deemed an original, this _____ day of _____, 20_____.

PRINCIPAL

ATTEST:

By: _____ By:_____

Title:_____ Title:_____

Address:_____

_____

(Corporate Seal)

SURETY

ATTEST:

Surety:_____

By: _____

By: _____

Attorney-in-Fact: _____

Title: _____

Address:_____

_____

(Surety Seal)

NOTE: Date of Bond must not be prior to date of the Construction Contract and Surety must be authorized to transact business in the State of Colorado and be acceptable to the Owner.

EXHIBIT ___
PERFORMANCE BOND

Bond No. _____

KNOW ALL MEN BY THESE PRESENTS: that

(Firm)_____

(Address)_____
(an Individual), (a Partnership), (a Corporation), hereinafter referred to as "the Principal", and

(Firm)_____

(Address)_____

hereinafter referred to as "the Surety", are held and firmly bond unto the Town of Frisco, Colorado, a municipal corporation hereinafter referred to as "the Owner", in the amount of _____ Dollars in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITIONS OF THIS OBLIGATION are such that whereas the Principal entered into a certain Construction Agreement with the Owner, dated the _____ day of _____, 20___, for the performance of certain Work (the "Construction Contract"), which is by reference made a part hereof,

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions and agreements of said Agreement during the original term thereof, and any extensions thereof which may be granted by the Owner, with or without Notice to the Surety and during the life of the guaranty period, and if shall satisfy all claims and demands incurred under such Agreement, and shall fully indemnify and save harmless the Owner from all cost and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the Owner all outlay and expense which the Owner may incur in making good any default, and then this obligation shall be void;

Otherwise the Principal and Surety shall have the following obligations:

1. If Owner is not in Default under the Construction Contract, Surety's obligation under this Bond shall arise after:

1.1 Owner has notified Principal and Surety at its address listed herein that Owner by seven days' written notice intends to terminate the services of Principal or otherwise declare Principal to be in default of its obligations under the Construction Contract; and

1.2 Owner has declared Principal to be in Default and formally terminated Principal's right to complete the Construction Contract; and

1.3 Owner has agreed to pay the Unpaid Balance of the Contract Price to Surety in accordance with the terms of the Construction Contract or to a Principal selected to perform the Construction Contract in accordance with the terms of the Construction Contract with Owner.

2. When Owner has satisfied the conditions of paragraph 1, Surety shall promptly and at Surety's expense take one of the following actions:

2.1 Arrange for Principal, with consent of the Owner, to perform and complete the Construction Contract; or

2.2 Undertake to perform and complete the Construction Contract itself, through its agents or through independent Principals; or

2.3 Obtain bids or negotiated proposals from qualified Principals acceptable to Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by Owner and the Principal selected with Owner's concurrence, to be secured with the performance and payment bonds executed by a qualified Surety equivalent to the Bonds issued on the Construction Contract, and pay to Owner the amount of damages as described in paragraph 4 in excess of the Unpaid Balance of the Contract Price incurred by Owner resulting from the Principal's Default; or

2.4 Waive its right to perform and complete, arrange for completion, or obtain a new Principal and with reasonable promptness under the circumstances, after investigation, determine the amount for which it is liable to Owner and, as soon as practicable after the amount is determined and approved by Owner, tender payment therefor to Owner.

3. If Surety does not proceed as provided in paragraph 2 with reasonable promptness, Surety shall be deemed to be in default on this Bond 15 days after receipt of an additional written notice from Owner to Surety demanding that Surety perform its obligations under this Bond, and Owner shall be entitled to enforce any remedy available to Owner. If Surety proceeds as provided in subparagraph 2.4 and Owner refuses the payment tendered or Surety has denied liability, in whole or in part, without further notice, Owner shall be entitled to enforce any remedy available to Owner.

4. After Owner has terminated Principal's right to complete the Construction Contract, and if Surety elects to act under subparagraph 2.1, 2.2, or 2.3 above, then the responsibilities of Surety to Owner shall not be greater than those of Principal under the Construction Contract, and the responsibilities of Owner to Surety shall not be greater than those of Owner under the Construction Contract. To the limit of the amount of this Bond, but subject to commitment by Owner of the unpaid balance of the Contract Price and to mitigation of costs and damages on the Construction Contract, Surety is obligated without duplication for:

4.1 The responsibilities of Principal for correction of defective work and completion of the Construction Contract; and

4.2 Additional legal, design professional and delay costs resulting from Principal's Default, and resulting from the actions or failure to act of Surety under paragraph 2; and

4.3 Liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of Principal.

5. Surety hereby waives notice of any change, including changes to the Construction Contract or to related subcontracts, purchase orders and other obligations.

6. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located and shall be instituted within two years after Owner declares Principal to be in default or within two years after Principal ceased working or within two years after Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to Sureties in the State of Colorado shall be applicable.

7. Any notice to the parties required under this Bond shall be in writing, delivered to the person designated below for the parties at the indicated address unless otherwise designated in writing. Only mailing by United States mail or hand-delivery shall be utilized. Facsimile and e-mail addresses may be provided for convenience only.

OWNER: The Town of Frisco
Project Manager:
P.O. Box 4100
Frisco, CO 80443

PRINCIPAL: _____
_____
_____
_____

SURETY: _____
_____
_____
_____

8. This Bond is to be governed by the laws of the State of Colorado.

9. Definitions.

9.1 Unpaid Balance of the Contract Price: The total amount payable by Owner to Principal under the Construction Contract after all proper adjustments have been made, including allowance to Principal of any amounts received or to be received by Owner in settlement of

insurance or other claims for damages to which Principal is entitled, reduced by all valid and proper payments made to or on behalf of Principal under the Construction Contract.

9.2 Default: Failure of the Principal or Owner, as the case may be, that has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Construction Contract.

IN WITNESS WHEREOF, this instrument is executed in five (5) counterparts, each one of which shall be deemed an original, this _____ day of _____, 20____.

PRINCIPAL

ATTEST:

By: _____ By: _____

Title:_____ Title: _____

Address: _____

_____

(Corporate Seal)

SURETY

ATTEST: Surety: _____

By: _____ By: _____

Attorney-in-Fact: _____ Title:_____

Address: _____

_____

(Surety Seal)

NOTE: Date of Bond must <u>not</u> be prior to date of Construction Contract and Surety must be authorized to transact business in the State of Colorado and be acceptable to the Owner.