



**City of Springfield
Community Development Division**

INVITATION TO BID

for
PROJECT/PROJECT #

A <u>NON-MANDATORY</u> PRE-BID MEETING:	
Date:	October 12, 2023
Time:	10:00 am
Location:	225 5th Street, Springfield OR, 97477 Jesse Maine Room
BID OPENING:	
Date:	October 26, 2023
Time:	2:00 pm
Location:	225 5th Street, Springfield OR, 97477 Room 3 or Zoom https://us06web.zoom.us/j/88902289863

The deadline for submitting questions regarding this Invitation to Bid, prior to bid opening is Monday, October 17, 2023, at 11:00 am as specified in Section 3.3 of the Instruction to Bidders.

- The complete set of bid documents for this project consists of two sections: *The Invitation to Bid Documents and the Project Plan Set.*
- For the City of Springfield to consider your Bid responsive, you must include the documents listed in the Instruction to Bidders, *Section 5.1 of the Bid Submittal and Forms and as indicated by Table of Contents.*
- *Any addendums or revisions must be acknowledged and submitted with your Bid except for plans and drawings, which are not required to be submitted as a part of your Bid.*



TABLE OF CONTENTS AND BIDDER'S CHECKLIST

Local Funding

Documents indicated with a checkbox must be included with each bid submittal for the bid to be considered responsive. *Documents without a checkbox do not need to be included in the bid submittal.*

Book 1: Invitation to Bid Documents

- Invitation to Bidders
- Bid Submittal, Terms, and Declarations (Acknowledge Addenda)
 - Instruction to Bidders
 - Contract (Sample)
 - Prevailing Wage Rate Information
 - Special Provisions – Scope of Work
- First-Tier Subcontractor disclosure form
- Financial Responsibility
- Certificate of Compliance – Statement of nondiscrimination/ORS 279A.110
- Minority, Woman, and Emerging Small Business/Disadvantaged Business Enterprise Form (MWESB)
- Conflict of Interest Disclosure Form (COI)
- Non-Collusion Affidavit
 - Bid Bond (Sample)
 - Performance Bond (Sample)
 - Payment Bond (Sample)
- Authorization to Legally Bind Bidder

Book 2: Project Plan Set and Standard Drawings– Separate Book

- Construction Plans and Drawings

Additional Documents to be submitted

- Bid Bond
- Addenda (if applicable)

CITY OF SPRINGFIELD, OREGON
Invitation to Bidders

Public Works Improvement Project

Project No. 650183

Title: Library / City Manager's Office Remodel Project

Description: Renovate approximately 11,000 SF of space to re-configure the current City Manager's offices and current library support services area. Scope includes moving/adding walls, replacing worn finishes, and moving/replacing existing casework. Project also renovates an approximately 2,500 SF office suite to support the re-location of the City Manager's offices. This will include creating new private offices, re-modelling the entry offices and conference room

Bid documents are available from Sam Kelly Quattrocchi at 541-726-3713 or skellyquattrocchi@springfield-or.gov or from the City of Springfield City Hall, City Manager's Office, 225 Fifth Street, Springfield, OR 97477, for no charge and are available for viewing at this location. Bid documents available online at <https://springfield-or.gov/city/finance/purchasing/> and many plan centers.

A **non-mandatory** pre-bid meeting will be held on **October 12, 2023**, at **10:00 a.m. 225 5th Street, Springfield, OR 97477, Jesse Maine Room** meeting room. The **deadline for submitting questions** regarding this Invitation to Bid is **Tuesday, October 17, 2023 at 11:00 am**. Contact with other City officials may be grounds for disqualification of the bid. All questions should be addressed to Sam Kelly Quattrocchi at 541-726-3713 or skellyquattrocchi@springfield-or.gov.

Any bidder requiring special assistance or auxiliary aids during the bidding and award process should contact Sam Kelly Quattrocchi at 541-726-3713 or skellyquattrocchi@springfield-or.gov at least two (2) business days before the scheduled program, activity, or meeting for hearing assistance or a sign language interpreter and at least five (5) business days before the event for all other meeting accommodations. Assistive listening systems are available for the hearing impaired in the Municipal Courtrooms and City Council Chambers. TTY users dial Oregon Relay Services at 711. Requests for documents in alternate formats should be submitted at least ten (10) calendar days prior to the date the materials are needed to allow time for the City to respond to the request. At the discretion of the City, submission deadlines may be extended to accommodate a request for alternate formats.

This project is subject to the state prevailing rates of wage under ORS 279C.800 to 279C.870. In accordance with ORS 279C.365, the City will not consider a bid unless it contains a statement by the bidder that they will comply with ORS 279C.838 through ORS 279C.870. Each bid must contain a statement as to whether the bidder is a resident bidder, as defined in ORS 279A.120.

All Contractors performing work on this project shall have a current, valid certificate of licensure issued by the Construction Contractor's Board in accordance with ORS 701 and, if performing work described in ORS 671.520, a current, valid certificate of licensure from the State Landscape Contractor's Board in accordance with ORS 671.560, as applicable, in place at the time the quote is presented.

The City of Springfield may reject any or all bids not in compliance with all prescribed public bidding procedures and requirements, including the requirement to demonstrate the bidder's responsibility under ORS 279C.375, or waive minor irregularities not affecting substantial rights and may reject for a good cause any or all bids upon a finding of the City of Springfield it is in the public interest to do so and accept such bids that in the opinion of the Springfield City Council are in the best interest of the City.

The City of Springfield encourages contractors, sub-contractors, minority, woman-owned, and emerging small businesses to participate in City projects.

Sealed bids will be received at City Hall Development and Public Works, Southeast Quad, Attn: Sam Kelly-Quattrocchi, Legislative & EcDev Analyst Contracts Analyst, 225 Fifth Street, Springfield, OR 97477, until, but no later than **2:00 pm Local Time, Tuesday October 26, 2023**, and opened immediately at City Hall and online in a Zoom meeting for the construction of the following public works improvement project in the City of Springfield:

Join Zoom Meeting

<https://us06web.zoom.us/j/88902289863>

Meeting ID: 889 0228 9863

One tap mobile

+19712471195,,88902289863# US (Portland)

+12063379723,88902289863# US (Seattle)

Dial by your location

• +1 971 247 1195 US (Portland)

• +1 206 337 9723 US (Seattle)

• 877 853 5247 US Toll-free

• 888 788 0099 US Toll-free

• 833 548 0276 US Toll-free

• 833 548 0282 US Toll-free

• 833 928 4608 US Toll-free

• 833 928 4609 US Toll-free

• 833 928 4610 US Toll-free

Meeting ID: 889 0228 9863

Find your local number: <https://us06web.zoom.us/u/kBq8L5EOe>



City of Springfield
225 Fifth Street
Springfield, OR 97477

Bid Submittal

Project No. 650183

Project Title: City Hall Library and City Manager's Office Remodeling Project

We submit a Lump Sum Base Bid for the construction of the above referenced project.

Base bid (\$)
Written Numerals.

Add Alternative 1 (\$)
Written Numerals.

Add Alternative 2 (\$)
Written Numerals.

Add Alternative 3 (\$)
Written Numerals.

Add Alternative 4 (\$)
Written Numerals.

The City of Springfield reserves the right to award any combination of the base bids and alternates in the best inters of the City

The undersigned Bidder agrees to construct a functionally complete project, in accordance with the terms and conditions as specified in the Request for Invitation to Bid documents, and to provide all resources that are required and that may reasonably be inferred to produce the intended result.

Terms, Declarations and Bid Submittal

Bidder's Understanding

Bidders shall determine for themselves all the conditions and circumstances affecting the projected cost of the proposed work by personal examination of the site, Contract documents, and by such other means they may deem to be necessary.

The Bidder is familiar with and is satisfied as to all federal, state and local laws and regulations that may affect cost, progress, and performance of the work.

Bid

The undersigned Bidder having examined the Specifications and Contractual Documents and having satisfied themselves as to all conditions to be encountered, hereby proposes to furnish all labor, material and equipment and perform all work necessary to complete Project No P11016 in accordance with this Bid, the

Contract Plans, applicable Building Codes, Section 100 of the City of Springfield Standard Construction Specifications, 1994 Edition and all subsequent modifications, Parts 00200 through 03000 of the 2015 Oregon Standard Specifications for Construction the, Special Provisions, and all other Contractual Documents at the prices and on the terms herein contained.

Bid Guarantee

As required by ORS 279C.365(5) each Bid shall be accompanied by a Bid Bond, cash, or a certified or cashier's check written upon a bank in good standing and in a form acceptable to the City, payable to the Finance Director of the City of Springfield, Oregon, in an amount equal to at least 10 percent of the total amount of the Bid. Bid Bonds shall be issued by a surety company registered to issue bonds in the State of Oregon, and utilizing a bond form acceptable to the City. The City will accept AIA Document A310-2010. The Bid Bond may not be altered.

Such Bid Guarantee shall be forfeited and become the property of the City in case the Bidder shall fail or neglect to furnish a satisfactory Performance and/or Payment Bond issued by a viable bond company acceptable to the City as required by ORS 279C.380 and to execute the Contract within ten (10) days (Saturday, Sunday, and holidays excepted) after receiving Contract from the City for execution. For information regarding Performance and Payment Bond requirements see City of Springfield Contract document, Section 5. City Bonding.

Bid Acceptance Period

This Bid will remain subject to acceptance for a period of 60 days after the bid opening, or for such longer period of time that the Bidder may agree to in writing upon request of the City.

Contract Award

Bids will be accepted and awarded in accordance with Oregon Public Contracting Law and Section 103.01 of the City's most recent version of the Standard Construction Specifications.

Prior to awarding the Contract, the City may, at its sole discretion, require Contractors and/or Subcontractors to demonstrate to the City's satisfaction that they have a complete and clear understanding of all requirements of the Prevailing Wage Rate Laws contained in ORS 279C.800 through 279C.870 and possess the expertise necessary for fulfilling their obligations pertaining to these requirements throughout the administration of the Contract. In determining competency, the City may consider Certified Payroll Reports submitted by the Contractor and/or Subcontractor for projects previously performed for the City, copies of Certified Payroll Reports submitted to other public entities, references from other public entities attesting to the Contractor's expertise, or an interview with the Contractor regarding their personnel resources and expertise or their ability to obtain the resources and expertise necessary to meet all contractual responsibilities in accordance with ORS 279C.375.

Time is of the Essence

Time is of the essence in the Contractor's performance of the Contract. Delays in the Contractor's performance of the work may inconvenience the public, interfere with business and commerce, and increase cost to the City. It is essential and in the public interest that the Contractor prosecute the work vigorously to Contract completion. The City does not waive any rights under the Contract by permitting the Contractor to continue to perform the Contract, or any part of it, after the Contract Time of Completion shown below, or as adjusted by Contract Change Order, has expired.

Liquidated Damages

The City of Springfield and the Contractor agree that; (a) the amounts so fixed are reasonable forecasts of just compensation for the harm that is caused by the breach; (b) the harm that is caused by the breach is one that is incapable of or very difficult of accurate estimation; and, (c) the amount so fixed is not fixed as a penalty to coerce performance of the Contract but is rather intended to be a genuine pre-estimation of injury to the City of Springfield in lieu of performance within the contract time by the Contractor.

a. Delay

It is agreed by the City of Springfield and by the Contractor that the need exists for a damage provision in the event the Contractor fails to complete the work within the Contract time specified, or any extension thereof, by the City of Springfield. The City of Springfield and the Contractor further agree that the

Contractor shall be liable to the City of Springfield for fixed, agreed and liquidated damages for each and every calendar day of delay in the amount of \$100 per day in accordance with Subsection 108.07 of the Standard Construction Specifications.

b. Failure to Report Spills

The contractor also agrees to liquidated damages in the amount of \$500.00 per incident for failure to report sewage spills plus an amount sufficient to reimburse the City for any civil and administrative penalties paid by the City as a result of the contractor's failure to report. Failure to report sewage spills may subject the City to (1) civil penalties of up to \$32,500.00 per day of violation pursuant to Section 309(d) of the Clean Water Act, 33 U.S.C. § 1319(d); (2) administrative penalties of up to \$11,000.00 per day for each violation, pursuant to Section 309(g) of the Clean Water Act, 33 U.S.C. § 1319(g); or (3) civil action in federal court for injunctive relief pursuant to Section 309(b) of the Clean Water Act, 33 U.S.C. § 1319(b).

Contract Time of Completion

The contractor shall not begin work under this Bid until written Notice to Proceed has been received. The contractor shall complete the work under this Bid within 120 consecutive calendar days from the date of actual commencement of work or the date occurring ten days after the date of the Notice to Proceed, whichever occurs first, or such other starting date as is fixed by the Notice to Proceed.

The Contractor shall apply for any extensions of time as specified in Subsection 108.06 of the Standard Construction Specifications.

Certifications

The undersigned hereby certifies that:

- 1.) If awarded the Contract, that they shall fully comply with all provisions regarding the prevailing wage rates as required by ORS 279C.800 to 279C.870 and/or 40 U.S.C. 2762 as applicable.
- 2.) The Contractor, Subcontractor, suppliers of materials or services, and others engaged by the Contractors, shall comply at all times with and observe all such laws, ordinances, regulations, orders, and decrees; and shall hold harmless and indemnify the City of Springfield and its representatives against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order, or decree.
- 3.) The Contractor, Subcontractor or other person doing, or contracting to do, or contracting for the whole or any part of the work on the Contract shall comply with all applicable requirements of Federal and State civil rights and rehabilitation statutes, rules and regulations.
- 4.) In conformance with OAR 137-049-0440(3) and ORS 279A.110(4) the Contractor has not, and will not, discriminate against a Subcontractor in the awarding of a subcontract because the Subcontractor is a minority, women or emerging small business enterprise certified under ORS 200.055 or a business enterprise that is owned or controlled by or that employs a disabled veteran, as defined in ORS 408.225.
- 5.) In accordance with ORS 279C.505, the Contractor will;
 - a) Make payment promptly, as due, to all persons supplying to the Contractor labor or material for the performance of the work provided for in the Contract.
 - b) Promptly pay all contributions or amounts due the State Industrial Accident Fund, or private carrier of accident insurance, from such Contractor or Subcontractor incurred in the performance of the Contract. If a private carrier is used, the Contractor shall notify the Engineer as to the carrier's name and address before commencement of work.
 - c) Not permit any lien or claim to be filed or prosecuted against the state or a county, school district, municipality, municipal corporation or subdivision thereof, on account of any labor or material furnished.
 - d) Pay to the Department of Revenue all sums withheld from employees under ORS 316.167.

- e) Have an employee drug testing program in place at the time of signing the contract and will maintain such drug testing program in place over the life of the Contract. Upon request, the Contractor shall furnish a copy of the employee drug testing program to the City.
- 6.) In accordance with ORS 279C.510, If demolition is involved, the Contractor shall salvage or recycle construction and demolition debris, if feasible and cost-effective as required by ORS 279C.510(1). If lawn or landscaping maintenance is involved, the Contractor shall compost or mulch yard waste in an approved site, if feasible and cost-effective as required by ORS 279C.510(2).
- 7.) In accordance with ORS 279C.520, no person will be employed by the Contractor or Subcontractor for more than 10 hours in any one day, or 40 hours in any one week except in cases of necessity, emergency, or where the public policy absolutely requires it, and in such cases the person so employed shall be paid at least time and one-half the regular rate of pay for all times worked in excess of eight hours a day or 40 hours in any one week when the work week is five consecutive days, Monday through Friday; or in excess of 10 hours a day or 40 hours in any one week when the work week is four consecutive days, Monday through Friday; and for all work performed on a Saturday, Sunday and on any legal holiday specified in ORS 279C.540.
- 8.) In compliance with ORS 279C.525 the Contractor has received and reviewed Federal, State and local agencies that may have enacted ordinances, rules or regulations dealing with the prevention of environmental pollution and the preservation of natural resources that may affect the performance of this Contract as identified under Section 13 of the Contract. Accordingly, if the Contractor is delayed or must undertake additional work by reason of ordinances, rules, or regulations relating to the prevention of environmental pollution and the protection of natural resources subsequent to the date of submission or the successful quote, the City may:
- a.) Terminate the Contract,
 - b.) Complete the work itself,
 - c.) Use non-owner forces already under contract with the City of Springfield,
 - d.) Solicit bids for a new contractor to provide the necessary services under competitive bid requirements 279C,
 - e.) Issue the Contractor a change-order setting forth additional work that must be undertaken.
- 9.) In accordance with ORS 279C.530, the Contractor will;
- a.) Promptly, as due, make payments to any person, co-partnership, association or corporation, furnishing medical, surgical, and hospital care or other needed care and attention, incidental to sickness or injury, to the employees of such Contractor, of all sums which the Contractor agrees to pay for such services and all monies and sums which the Contractor:
 1. May or shall have deducted from the wages of his employees for such services pursuant to the terms of Oregon Revised Statutes and any contract entered in pursuant thereto; or
 2. Collected or deducted from the wages of his employees pursuant to any law, contract, or agreement for the purpose of providing or paying for such service; and
 3. All employers working under the Contract are either employers that will comply with ORS 656.017 or employers that are exempt under ORS 656.126. The Contractor shall ensure that each of its Subcontractors complies with these requirements.
- 10.) No Contractor, Subcontractor or any firm, corporation, partnership or association in which the Contractor or Subcontractor has a financial interest who appears on the *List of Contractors Ineligible to Receive Public Works Contracts*, as established by the Bureau of Labor and Industries, will perform work under this Contract, as specified in ORS 279C.860.
- 11.) No Contractor, Subcontractor or any firm, corporation, partnership or association in which the Contractor or Subcontractor has a financial interest who appears on the Construction Contractor's

Board *Not Qualified to Hold Public Contracts* list, will perform work under this Contract, as specified in ORS 701.227(4).

- 12.) The Contractor performing work on this project shall have a current, valid certificate of licensure issued by the Construction Contractor's Board in accordance with ORS 701 and, if performing work described in ORS 671.520, a current, valid certificate of licensure from the State Landscape Contractor's Board in accordance with ORS 671.560 as applicable in place at the time the quote is presented.
- 13.) Prior to performing any work under the Contract all Subcontractors shall have a current, valid certificate of licensure issued by the Construction Contractor's Board in accordance with ORS 701 and, if performing work described in ORS 671.520, a current, valid certificate of licensure from the State Landscape Contractor's Board in accordance with ORS 671.520 as applicable.
- 14.) In compliance with ORS 279C.836, the Contractor shall confirm that all Subcontractors have a valid public works bond on file with the Construction Contractors Board prior to allowing them to perform any work under the Contract.
- 15.) If the Contract specifies that the project includes Asbestos Abatement, the Contractor and all Subcontractors performing work on the project shall be licensed in accordance with ORS 467A.720 prior to performing any work on the project. Certification of compliance shall be presented to the City upon request.
- 16.) The Contractor shall function as an independent contractor for the purposes of this Contract and shall not be considered an employee of the City of Springfield for any purpose. The Contractor shall assume sole responsibility for any debts or liabilities that may be incurred by the Contractor in fulfilling the terms of this Contract and shall be solely responsible for the payment of all federal, state, and local taxes which may accrue because of this Contract.
- 17.) The Contractor and all Subcontractors shall comply with all applicable provisions of the Americans With Disabilities Act of 1990, 42 USC Section 12101 et seq. and Section 504 of the Rehabilitation Act of 1973.

Bid Addenda

All Addenda issued are considered to be part of the specifications of the Invitation to Bid and, as such, are as incorporated into the Contract as specified in Section 104.02 of the Standard Construction Specifications.

By signing below, I acknowledge the receipt of the following Addenda documents and certify that the specifications contained in each have been considered and incorporated into the Bid as presented. All Addenda must be included with the Bid submitted.

Addenda Number	Addenda Date

Declarations

As required by ORS 305.385(6), under penalty of perjury, by signing below the Contractor represents that, to the best of their knowledge, neither they nor any applicable Subcontractors performing work under the Contract are in violation of any tax laws as described in ORS 305.380(4) and have complied with the tax laws of this state or a political subdivision thereof including, but not limited to, ORS 305.620 and ORS Chapters 316, 317 and 318. The Contractor shall also covenant to continue to comply with the tax laws of this state or a political subdivision thereof during the term of the Contract and that Contractor's failure to comply with such laws prior to execution of the Contract or during the term thereof is a default for which the City may terminate the Contract and seek damages and other relief available under the terms of the Contract or under applicable law.

The undersigned Bidder declares that the only persons or parties interested in the Bid are those named herein, that this Bid is, in all respects, fair and without fraud, that it is made without collusion with any official of the City, and that the Bid is made without any connection or collusion with any person submitting another Bid on this project.

I have read, fully understand, and agree that as Bidder I, and all Subcontractors, will comply with all of the terms and conditions of the contract for which this Bid is presented. By signing below I attest that I am an officer or a duly authorized representative of the business listed below and that I possess the legal authority to submit this Bid for consideration.

If the Bid is submitted by a joint venture and is in the name of the joint venture, by signing below I certify that all parties have examined this Bid, including all requirements and the Contract terms and conditions and, if successful, the joint venture shall execute a Contract which incorporates the stated requirements, terms and conditions.

Bidder's Signature _____

Bidder's Name *(Please Print)* _____

Title _____

Business Name _____

Business Address _____

City _____ State _____ Zip _____

Phone Number _____ Cell Phone _____

E-mail Address _____ Fax Number _____

Date _____



CITY OF SPRINGFIELD

INSTRUCTION TO BIDDERS

Local Funding Sources

1. Contracting Law

The Bidder is presumed to be familiar with all federal, state, and local laws, ordinances and regulations, orders and decrees which affect those engaged or employed in the work, materials, or equipment used in the proposed construction or which may affect the conduct of the work. If the Bidder or Contractor shall discover any provision in the Contract Documents which is contrary to or inconsistent with any law, ordinance, or regulation, he/she shall immediately report it to the Owner in writing.

The Contractor, Subcontractor, suppliers of materials or services, and others engaged by the contractors, shall comply at all times with and observe all such laws, ordinances, regulations, orders, and decrees; and shall hold harmless and indemnify the City of Springfield and its representatives against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order, or decree.

2. Prequalification

There is no prequalification application to this Contract. Bidders unfamiliar to the City and who are not currently pre-qualified with ODOT or the City, may be required to prove to the City that they have the adequate resources, experience and equipment to complete the work.

3. Contract Documents

3.1 Plans and Specifications

Plans, Specifications, and any additional information relative to this project which are on file in the City Engineer's Office shall be made available there for inspection by prospective Bidders.

3.2 Examination of Contract Documents and Site of Work

Bidders shall determine for themselves all the conditions and circumstances affecting the projected cost of the proposed work by personal examination of the site, Contract Documents, and by such other means. It is understood and agreed that the City has obtained information regarding underground or other conditions or obstructions depicted in the Contract Documents from data at hand. There is no expressed or implied agreement that such conditions are fully or correctly shown, and the Bidder must take into consideration the possibility that conditions affecting the cost or quantity of work may differ from those indicated.

3.3 Interpretation of Contract Documents

If it should appear to a Bidder that the work to be done is not sufficiently described or explained in the Contract Documents, or that Contract Documents are not definite and clear, the Bidder shall make written inquiry regarding same to the individual shown, in the manner instructed and within the timeframe indicated in the Invitation to Bid advertisement. Questions received will be evaluated and if, in the judgment of the City, the response does not alter or amend the requirements or scope of the Invitation to Bid, but merely clarifies existing information, the response will be entered on the Clarifications Log and posted to the project webpage as shown in the Invitation to Bid. If, in the judgment of the City, additional information or interpretation is necessary, such information shall be supplied in the form of an addendum to all individuals, firms, and corporations listed on the Plan Holders List and those individuals that attended

the Pre-Bid Meeting and provided an accurate e-mail address on the sign-in sheet. Such addenda shall have the same binding effect as though contained in the main body of the Contract Documents. The City is not responsible for any explanation, clarification, interpretation, or approval made or given in any manner except by written addenda issued by City.

3.4 Addenda to Contract Documents

Any addenda issued by the City, which may include changes, corrections, additions, interpretations, or information issued 72 hours or more before the scheduled closing time for filing the Bids shall be binding upon the Bidder. Addenda will be posted to the City's website at [Invitations to Bid - City of Springfield Oregon \(springfield-or.gov\)](https://www.springfield-or.gov/Invitations-to-Bid); click under the project the addenda pertains to. The Contractor should check the website frequently for new postings during the open bid period. The City shall make a reasonable effort to notify all individuals, firms, and corporations listed on the Plan Holders List and those individuals that attended the Pre-Bid Meeting and provided an accurate e-mail address on the sign-in sheet when addenda are issued. Failure of the Contractor to receive or obtain such addenda shall not excuse them from compliance.

4. Estimate of Listed Quantities

The estimate of quantities of work to be done under unit price bids is approximate and is given only as the basis of calculation for comparison of Bids and award of the Contract. The Owner does not agree that the actual amount of work will correspond precisely to the amount as shown or estimated. Payment will be made at unit prices under a Contract only for work actually performed or materials actually furnished according to actual measurements.

The Owner reserves the right to increase or decrease the amount of any class or portion of the work. No such change in the work shall be considered as a waiver of any condition of the Contract, nor shall such change invalidate any of the provisions thereof.

5. Bid

5.1 Bid Submittal and Forms

The complete set of bid documents for this project consists of two sections, the Invitation to Bid Documents and the Project Plan Set.

For the City of Springfield to consider your bid responsive, you must include all documents listed in the Instruction to Bidders, in numerical order according to the Table of Contents.

The forms that must be included with all bid submittals, include:

1. Bid Submittal, Terms and Declarations
2. First-Tier Sub-Contractor Disclosure Form
3. Financial Responsibility Form
4. Certificate of Compliance - Statement of Non-Discrimination/ORS 279A.110
5. Minority, Woman and Emerging Small Business/Disadvantaged Business Enterprise Form (MWESB)
6. Conflict of Interest Disclosure Form (COI)
7. Non-Collusion Affidavit
8. Bid Bond

The Project Plan Set is not required to be submitted as part of your bid.

Additionally, any addendums or revisions must be acknowledged and submitted with your Bid.

The Bid Submittal, Bid Bond, Certified Check, or Cashier's Check shall be enclosed in a sealed and labeled

envelope. The outside of the envelope shall plainly identify: The project name and project number and (2) The Bid opening date. All Bids must be clearly and distinctly typed or written with ink or indelible pencil. Unless otherwise specified, Bidders shall bid on all Bid items, and must include in their Bid prices the entire cost of each item of work set forth in the Bid.

Any statement accompanying and tending to qualify a Bid may cause rejection of such Bid, unless such statement is required in a Bid embracing alternate Bids. If, in the opinion of the City, the items or prices in any Bid appear unbalanced, incomplete, or fail to comply with all the terms required, the Bid may be rejected.

Sealed Bids shall be labeled clearly, addressed to Amanda Clinton, Contracts Analyst, and received at City of Springfield, City Hall, Development and Public Works, "Southeast Quad", 225 Fifth St. Springfield, Oregon, 97477 at, or before, the time and date noted on the Invitation to Bidders, after which time the Bids will be publicly opened and read aloud.

All Bids shall be on the form furnished by the City, and in addition to necessary unit price items and total prices in the column of totals to make a complete Bid, all applicable blanks giving general information must be filled in and the Bids signed by an officer or duly authorized representative of the Bidder. The only exceptions to this requirement are the Performance Bond, Payment Bond and the Contract documents which are provided here as a reference. However, if you are awarded the Bid, you will be required to submit fully executed copies of these documents upon request.

5.2 First Tier Subcontractor Statement

Bidders are required to disclose information about certain first-tier subcontractors when the contract value for a Public Improvement is greater than \$100,000 (see ORS 279C.370). If the total Bid price for the contract exceeds \$100,000, the Bidder shall submit on the form provided (within two working hours of the date and time of when the bids are due), a list of all first-tier subcontractors (those entities that would be contracting directly with the prime Contractor) which will be furnishing labor or material on the Contract whose subcontract value would be equal to or greater than 5 percent of the total Bid price, but at least \$15,000. Also, any Subcontractor with a subcontract value greater than \$350,000, regardless of the percentage of the total Bid price, must be listed. The following information must be listed: a) The Subcontractor's name and address, b) The Subcontractor's Construction Contractor Board registration number, if one is required, and c) The subcontract dollar value. If no subcontractors are being used that are subject to the above disclosure requirements, the Bidder is required to indicate "None" on the accompanying form. The form may be submitted with the Bid or may be submitted separately in a separate envelope from the Bid within two hours after the bid opening. The envelope containing the form should be marked "Subcontractor Disclosure Form Submitted for Project PXXXXX" and should also be marked with the name of the Bidder.

5.3 Non-Discrimination

Pursuant to ORS 279A.110, that the bidder has not discriminated and will not discriminate against a disadvantaged business enterprise, a minority-owned business, a woman-owned business, a business that a service-disabled veteran owns, or an emerging small business in obtaining any required subcontracts. The bidder understands that it may be disqualified from bidding on this public improvement project if the Agency finds that the bidder has violated subsection (1) of ORS 279A.110. The Bidder certifies that it has a written policy and practice that meets the requirements described in ORS 279A.112 (House Bill 3060, 2017) of preventing sexual harassment, sexual assault and discrimination against employees who are members of a protected class.

5.4 Non-Collusion

The price(s) and amount of this bid have been arrived at independently and without consultation, communication, or agreement with any other contractor, bidder, or potential bidder except as disclosed on

a separately attached statement. Neither the price(s) nor the amount of this bid, and neither the approximate price(s) nor approximate amount of this bid has been disclosed to any other firm or person who is a bidder or potential bidder, and they will not be disclosed before the opening of bids. No attempt has been made or will be made to induce any firm or person to refrain from bidding on this contract, to submit a bid higher than this bid, or to submit any intentionally high or noncompetitive bid or other form of complementary bid. This bid is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary or other noncompetitive bid. The bidder, its affiliates, subsidiaries, officers, directors, and employees are not currently under investigation by any governmental agency and have not in the last four years been convicted of or found liable for any act, prohibited by State or Federal law in any jurisdiction, involving conspiracy or collusion with respect to bidding on any public contract except as described on a separately attached statement. The bidder understands and acknowledges that the above representations are material and important and will be relied on by the Agency, in awarding the contract(s) for which this bid is submitted. The bidder understands that any misstatement in this certification is and shall be treated as fraudulent concealment from the Agency, of the true facts relating to the submission of bids for this contract.

5.5 Compliance With Oregon Tax Laws:

By signature on this bid, the undersigned hereby certifies under penalty of perjury that the undersigned is authorized to act on behalf of bidder, that the undersigned has authority and knowledge regarding bidder's payment of taxes, and that bidder is, to the best of the undersigned's knowledge, not in violation of any Oregon Tax Laws. For purposes of this certification, "Oregon Tax Laws" means a state tax imposed by ORS 320.005 to 320.150 (Amusement Device Taxes), ORS 403.200 to 403.250 (Tax For Emergency Communications), and ORS Chapters 118 (Inheritance Tax), 314 (Income Tax), 316 (Personal Income Tax), 317 (Corporation Excise Tax), 318 (Corporation Income Tax), 321 (Timber And Forestland Tax), and 323 (Cigarettes And Tobacco Products Tax), and any local taxes administered by the Department of Revenue under ORS 305.620.

5.6 Withdrawal, Modification, or Alteration of Bid

A Bid may be withdrawn on written or telegraphic request of the Bidder prior to the scheduled closing time for filing Bids. No Bidder may withdraw its Bid or any portion thereof after the time set for the opening of Bids until a Contract has been awarded and executed or until sixty (60) days have elapsed since the Bid opening. Negligence on the part of the Bidder in preparing its Bid confers no right to withdraw its Bid after the scheduled closing time for filing Bids.

Prior to the scheduled closing time for filing Bids, changes may be made provided the changes are initialed by the Bidder or its Agent. If the intent of the Bidder is not clearly identifiable, the interpretation most advantageous to the City will prevail.

5.7 Late Bids

Bids received after the scheduled closing time for filing Bids as set forth in the Invitation to Bidders will be rejected and returned unopened to the Bidder unless such closing time is extended by the City.

5.8 References

In order to comply with the requirements of ORS279C.375 regarding the determination of bidder responsibility, completion of the *Financial Responsibility Form* included in the Invitation to Bid documents must be completed in full. The City will use the information provided to ascertain the financial responsibility of the bidder as it pertains to the specific criteria to be considered prior to award of a public works contract.

The City reserves the right to investigate the references, financial capacity, credit history and past

performance of any Bidder, including service(s) provided to City of Springfield, with respect to their successful performance on other projects; compliance with specifications and contractual obligations; expertise regarding the completion and submission of Certified Payroll Reports; completion or delivery of a project on schedule and within budget; and its lawful payment of suppliers, subcontractors and workers. The City reserves the right to use any information or reference that may be discovered in evaluating any bid. The City reserves the right to find a bid to be nonresponsive for failure or refusal of bidder to provide all information in a timely manner, as requested. The city may postpone issuance of a Notice of Intent to Award in order to complete its investigation. The City reserves the right to reject any bid at any time prior to the City's execution of a Contract in the event reference checks prove unsatisfactory. The City's investigation may include Bidder's previous business entities of the principals involved. If more than one Bidder is involved the City may investigate each entity. In the event that the city requests information from the Bidder the completeness of the information submitted, its veracity and the extent to which it has been independently verified will impact the City's decision.

5.9 Bid Ownership

All material submitted by the Contractor shall be considered the property of the City, and as such, shall not be returned to the Contractor after the deadline for submission of the Bid in question has passed. After opening, all bids will become part of the public record unless exempt under Oregon Public Records Law, see ORS 192.501, ORS 192.502 and ORS 279C.340.

5.10 Rejection of Bids

The City reserves the right to reject any or all Bids in whole, or in part, or to waive irregularities not affecting substantial rights.

General or evasive replies will be considered grounds for rejection of the Bid as incomplete. The successful Bidder may be required to appear before the City Council and submit satisfactory evidence that he or she has the necessary capital and is qualified and prepared to prosecute the work to the full satisfaction of the Engineer.

The City also reserves the right to reject any Bid which is 10 percent greater or 20 percent less than the Engineer's estimate or any Bid which contains item bids which vary more than 30 percent plus or minus from the Engineer's item bid estimate.

6. Payments by Contractor

6.1 Wages

It is agreed that if this project qualifies under Oregon law as a prevailing wage rate public works project, each worker in each trade or occupation employed in the performance of this Contract either by the Contractor, Subcontractor or other person doing or contracting to do or contracting for the whole or any part of the work on the Contract, must be paid not less than the applicable prevailing wage rate. If this project contains both federal and state funds, the hourly wages shall be not less than the higher of the state or the federal amount of the prevailing rate of wage. Prevailing wage rate payments include fringe benefits, for each trade or occupation in the locality where such labor or work is performed, as determined by the commissioner, in which the workers are employed. The existing rate of wage is the rate, in effect at the time the initial specifications were first advertised for bid solicitations as determined by the Commissioner of the Bureau of Labor and Industries under ORS279C.815.

If any dispute arises as to what is the prevailing rate of wage for the same trade or occupation in the locality and if that dispute cannot be settled by the parties involved, the dispute may be referred to the Commissioner of the Bureau of Labor and Industries, who shall then determine the prevailing rate of wage for the same trade or occupation in the locality.

It shall be the responsibility of the Contractor and any Subcontractor to post the prevailing wage rates on

the job site in a conspicuous place which is accessible to employees and must remain posted for the duration of the job.

6.2 Certification

No Bid will be received or considered by the City unless the Bid contains a statement by the Bidder as part of the Bid that the Bidder shall comply with provisions regarding prevailing rates of wages required by ORS 279C.840.

CITY OF SPRINGFIELD PUBLIC IMPROVEMENT CONTRACT

FOR USE WITH OREGON STANDARD SPECIFICATIONS FOR CONSTRUCTION

PROJECT # _____

Dated:

Parties: City of Springfield "CITY"
A Municipal Corporation of the State of Oregon
225 5th Street
Springfield, OR 97477

and

"Contractor"

Additional Contractor Information:

- a) Type of Entity: Sole Proprietorship Partnership
 Limited Liability Comp Corporation
- b) Address:
- c) Telephone:
- d) Fax No:
- e) If Applicable, Listed among the Parties Excluded from Federal Procurement or Non-Procurement Programs found at: <https://www.sam.gov/portal/public/SAM/>: Yes No

City Account Number(s) To Be Charged (Include Percentages):

Account Number	Percentage

RECITALS

Contractor was the successful bidder for the contract for the construction of the public improvement project described in the plans and specifications for the project that were included in the bid documents and the 2021 Oregon Standard Specifications for Construction, issued by the Oregon Department of Transportation, as modified by the City's Amendments to the Specifications for the Project and any other Supplemental Specifications and Special Provisions included in the Bid Documents (all specifications, plans, Standard Drawings, Supplemental Specifications and Special Provisions included in the Contract are collectively referred to herein as the "Specifications") which form a part of the Contract.

AGREEMENT

- 1. The Contract.** The Contract between the City and Contractor (the "Contract") includes this Document and its exhibits, together with all of the documents and materials included in the definition of the "Contract Documents" in 00110.20 of the Specifications. In addition, the Contract between the City and Contractor shall be deemed to incorporate all reports, records, laws, rules and orders referenced in the Contract documents.

This Document includes and incorporates the following Exhibits:
Exhibit A - Solicitation Documents.

- 2. Definitions.** Unless otherwise specifically defined in this Document, all capitalized terms which are not proper nouns shall have the meanings assigned thereto in the Specifications.
- 3. Project.** The project is generally described as:

[Add project description here]

- 4. Work to be Performed.** Contractor agrees to furnish all services, labor, materials and equipment for and to construct the improvement listed above (the "Project"), according to the Bid Documents ("the Work") and according to the provisions of the Contract. All parts of the Work are the sole responsibility of Contractor.
- 5. Time of Commencement and Completion.** Time is of the Essence of the Contract. The time in which Contractor shall commence, prosecute and complete the Work is described in Section 00180 of the Specifications.
- 6. Contract Amount.** The Contract Amount is \$ [redacted] and consists of unit prices bid by Contractor multiplied by estimated quantities, together with lump sum amounts for portions of the Work, as described on Contractor's Bid attached hereto. The actual sum payable to Contractor for the Work shall be based on lump sum amounts and actual quantities, as modified by Change Orders and adjustments made in accordance with the Specifications. Payment will be made as provided in the Specifications.
- 7. Indemnification and Hold Harmless.** To the fullest extent permitted by law, Contractor shall indemnify, defend (with counsel approved by City) and hold harmless the parties as described in 00170.72 of the Specifications.
- 8. Insurance.** Contractor shall maintain in force for the duration of the Contract the insurance coverages specified in 00170.70 of the Specifications. Each policy required by these provisions shall be written as a primary policy, not contributing with or in excess of any coverage which City may carry. Unless otherwise specified, each policy shall be written on an "occurrence" form with an admitted insurance carrier licensed to do business in the state of Oregon. In the event the statutory limit of liability of a public body for claims arising out of a single accident or occurrence is increased above the combined single limit coverage requirements specified below, City shall have the right to require Contractor to increase Contractor's coverages by the amount of the statutory limit increase for such claims and to increase the aggregate coverage by an amount that is

twice as large as the statutory increase. The adequacy of all insurance required under the Contract shall be subject to approval by City's Risk Manager. Failure to maintain any insurance coverage required by the Contract shall be cause for immediate termination of the Contract by City.

8.1.Evidence of Insurance Coverage. Evidence of the required insurance coverages issued by an insurance company satisfactory to the City shall be provided to the City by way of a City approved certificate of insurance before any work or services commence.

8.2.Notice of Cancellation or Material Change in Coverage. The certificate of insurance shall contain a requirement that the Insurance company notify the City 30 days prior to any cancellation or material change in coverage. If the approved insurance company will not provide this 30 day notice, the Contractor shall provide written notice to the City contract manager within two days after the Contractor becomes aware that their coverage has been canceled or has been materially changed. The Contractor shall either fax 541-726-3782 said notice or email it directly to City Finance Department at purchasing@springfield-or.gov. Regardless of what circumstances cause Contractor's insurance coverage to cease or be modified, it is the Contractor's responsibility to notify the City. Failure to maintain proper insurance or provide notice of cancellation or modification shall be grounds for immediate termination of this contract.

9. Performance and Payment Bonds. Prior to the commencement of the Work, Contractor shall provide good and sufficient performance and payment bonds as described in 00130.40 of the Specifications for approval by City and in the form of the bonds included in the Solicitation Documents.

10.Termination and Suspension. City may terminate the Contract or suspend the Work at any time as provided in 00180 of the Specifications.

11.Nonresident Contractors.

11.1. When a public contract is awarded to a nonresident bidder and the contract price exceeds \$10,000, the bidder shall promptly report to the Department of Revenue on forms to be provided by the department the total contract price, terms of payment, length of contract and such other information as the department may require before the bidder may receive final payment on the public contract. The contracting agency shall satisfy itself that the requirement of this subsection has been complied with before the contracting agency issues a final payment on a public contract.

11.2. As used in this paragraph, "nonresident contractor" means a contractor that: (A) has not paid unemployment taxes or income taxes in the state of Oregon during the 12 calendar months immediately preceding submission of the bid for the contract, (B) does not have a business address in this state and (C) stated in the bid for the contract that it was not a "resident bidder" under ORS 279A.120.

12.Default; Remedies. Upon Contractor's default or if in the public interest, City may terminate the Contract and take all other remedial actions available to City, as further specified in the 00180.90 of the Specifications. Without limiting the City's right to

disqualify Contractor pursuant to ORS279C.440, if Contractor willfully violates any of the provisions of sections EC 4.615 to 4.650 of The Eugene Code, 1971 or any of the provisions of State law or City's administrative rules governing public contracts, or if Contractor knowingly files false affidavits or certificates of compliance required under the Contract, Contractor shall waive for a period of one year any right to bid upon any public improvement project let by City. City's claims for damages and any other equitable relief available to City resulting from Contractor's breach shall survive a termination of the Contract.

13. Liquidated Damages. In the event the Work is not completed within the contract time as specified in the Contract, Contractor shall pay to City liquidated damages, as further specified in 00180.85 of the Specifications. [Note to City staff – must determine amounts in Special Provisions for each contract or omit this language.]

14. Notices. Any written notices permitted or required by the Contract shall be delivered according to 00150.30 of the Specifications to the attention of the representatives of the parties set for below, or such other address and/or numbers as either party may provide to the other by notice given in accordance with this provision.

Contractor: [Add contractor name, address, phone, fax or email]

City: [City staff name and email, address, phone number]

15. Contract Documents; Interpretation. Where possible, all parts of the Contract shall be interpreted in a manner that avoids conflict between the various documents and their provisions. In the event that any provision of this Document conflicts with any provision of the Specifications, the discrepancy will be resolved in the order of precedence in 00150.10 of the Specifications.

16. Dispute Resolution. All disagreements, protests, and claims relating to the Contract, including claims for additional compensation and time for performance and completion of the Work, must be resolved according to section 00199 of the Specifications.

17. Venue & Choice of Law. The Contract shall be governed by and interpreted in accordance with the laws of the State of Oregon without regard to principles of conflict of laws. If federal funding is included in the Contract, applicable Federal requirements govern in the event of conflicts among Federal, State and local laws. Any dispute between the Agency and the Contractor that arises from or relates to this Contract and is not resolved under the provisions of 00199 of the Specifications, shall be brought in the forum described in 00170.00.

18. Force Majeure. If Contractor is delayed by reason of weather, fire, riot, strikes, acts of God or other circumstances beyond Contractor's reasonable control, City may terminate this Agreement in writing to Contractor after determining such delay or default will unreasonably prevent successful performance of the Contract. If City elects not to terminate the Contract, Contractor will be entitled to additional time to complete the Contract equal to that lost by an or all of the above causes.

19. Severability. If any provision of this Agreement is declared by a court to be illegal or in conflict with any law, the validity of the remaining terms and provisions will not be

affected; the rights and obligations of the parties will be construed and enforced as if the Agreement did not contain the particular provision held to be invalid.

20. Waiver. Failure of City to enforce any provision of this Agreement shall not constitute a waiver or relinquishment by City of the right to such performance in the future nor of the right to enforce any other provision of this Agreement.

21. Amendments. The terms of this Agreement shall not be waived, altered, modified, supplemented or amended in any manner whatsoever, without prior written approval of City. No modification of this Agreement shall bind either party unless reduced to writing and subscribed by both parties, or ordered by a Court.

22. Assignment/Subcontract. Contractor shall not assign, sell, transfer, subcontract or sublet rights, or delegate responsibilities under this Agreement, in whole or in part, without the prior written approval of City. No such written approval shall relieve Contractor of any obligations of this Agreement, and any transferee or subcontractor shall be considered the agent of Contractor. Contractor shall remain liable as between the original parties to this Agreement as if no such assignment had occurred.

23. Compliance with All Government Regulations. Contractor shall comply with all Federal, State and local laws, codes, regulations and ordinances applicable to the work performed under this Agreement. Failure to comply with such requirements shall constitute a breach of contract and shall be grounds for termination of this Agreement. Damages or costs resulting from noncompliance shall be the sole responsibility of Contractor. This section includes, but is not limited to, compliance with all applicable requirements of Federal and State civil rights statutes, rules, and regulations, and all applicable provisions of the Americans with Disabilities Act of 1990, 42 USC Section 12101 et seq. and Section 504 of the Rehabilitation Act of 1973.

24. Construction of Agreement. This Contract shall not be construed more favorably to City due to the preparation of this Contract by City. The headings and subheadings in this Contract are for convenience, do not form a part of this Contract, and shall not be used in construing this Contract.

25. Entire Agreement. This Agreement signed by both parties is the parties' final and entire Agreement and supersedes all prior and contemporaneous oral or written communications between the parties, their agents and representatives. There are no representations, promises, terms, conditions or obligations other than those contained herein.

26. Third Party Beneficiaries. The parties to the Contract do not intend to confer on any third party any rights under the Contract, except as otherwise described in 00170.79 of the Specifications. All Subcontractors are third parties.

27. Survival. Any obligation arising under the Contract which is not, or cannot be performed or paid prior to the expiration or termination of the Contract, including, but not limited to, all provisions concerning the quality of the Work, warranties and obligations for payment, indemnification, and reimbursement, shall survive termination or expiration of the Contract.

CITY OF SPRINGFIELD:

By: _____
Name: _____
Title: _____
Date: _____

CONTRACTOR:

By: _____
Name: _____
Title: _____
Date: _____

SAMPLE

**City of Springfield Public Contract Addendum
Required Contract Terms Under ORS 279B – Goods, Services, and Personal Services**

Pursuant to Oregon law, this public contract includes the following terms and conditions, when applicable:

1. The contractor must make payment promptly, as due, to all persons supplying to the contractor labor or material for the performance of the work provided for in the contract. ORS 279B.220(1).
2. The contractor must pay all contributions or amounts due the Industrial Accident Fund from the contractor or subcontractor incurred in the performance of the contract. ORS 279B.220(2).
3. That contractor must not permit any lien or claim to be filed or prosecuted against the state or a county, school district, municipality, municipal corporation or subdivision thereof, on account of any labor or material furnished. ORS 279B.220(3).
4. The contractor must pay to the Department of Revenue all sums withheld from employees under ORS 316.167. ORS 279B.220(4).
5. If the agreement is for lawn and landscape maintenance, Contractor must salvage, recycle, compost or mulch yard waste material at an approved site, if feasible and cost-effective. ORS 279B.225.
6. The contractor must promptly, as due, make payment to any person, co-partnership, association or corporation furnishing medical, surgical and hospital care services or other needed care and attention, incident to sickness or injury, to the employees of the contractor, of all sums that the contractor agrees to pay for the services and all moneys and sums that the contractor collected or deducted from the wages of employees under any law, contract or agreement for the purpose of providing or paying for the services. All employers shall comply with ORS 656.017. ORS 279B.230.
7. A person may not be employed for more than 10 hours in any one day, or 40 hours in any one week, except in cases of necessity, emergency or when the public policy absolutely requires it, and in such cases, except in cases of contracts for personal services designated under ORS 279A.055, the employee shall be paid at least time and a half pay:
 - a. For all overtime in excess of eight hours a day or 40 hours in any one week when the work week is five consecutive days; or
 - b. For all overtime in excess of 10 hours in any one day or 40 hours in any one week when the work week is four consecutive days, Monday through Friday; and
 - c. For all work performed on Saturday and on any legal holiday specified in ORS 279B.020.
8. An employer must give notice in writing to employees who work on a public contract, either at the time of hire or before commencement of work on the contract, or by posting a notice in a location frequented by employees, of the number of hours per day and days per week that the employees may be required to work. ORS 279B.235(1)-(2).
9. If the agreement is for personal services, the contract shall contain a provision that the employee shall be paid at least time and a half for all overtime worked in excess of 40 hours in any one week, except for individuals under personal services contracts who are excluded under ORS 653.010 to 653.261 or under 29 U.S.C. 201-209 from receiving overtime. ORS 279B.235(3).
10. If the contract is for services, persons employed under contracts shall receive at least time and half pay for work performed on the legal holidays specified in a collective bargaining agreement or in ORS 279B.020(1)(b)(B)-(G) and for all time worked in excess of 10 hours in any one day or in excess of 40 hours in any one week, whichever is greater. Contractor shall give notice in writing to employees who work on a contract for services, either at the time of hire or before commencement of work on the contract, or by posting a notice in a location frequented by employees, of the number hours per day and days per week that the employees may be required to work. ORS 279B.235(5).

PREVAILING WAGE RATE INFORMATION

Prevailing Wage Rates information can be found at the following website:

[BOLI : Prevailing Wage Rates : For Employers : State of Oregon](#)

For the proper Prevailing Wage Rates applicable to this project, please refer to the following publications:

- 1) *Prevailing Wage Rate Publication; Prevailing Wage Rates for Public Works Contracts in Oregon, effective **July 5, 2023.***

The following Amendments to the Prevailing Wage Rates for Public Works Contracts in Oregon also apply;

Effective January 1, 2023, Senate Bill 588 removes the exemption of sick time for employees covered by a collective bargaining agreement. You can find a list of frequently-asked-questions at BOLI's website: <https://www.oregon.gov/boli/employers/Documents/FAQ%20for%20SB%20588.pdf>. For any questions regarding sick time, please contact BOLI's Employer Assistance Program at 971-361-8400 or employer.assistance@boli.oregon.gov.

If you have prevailing wage rate questions, please contact the Wage and Hour Division's Prevailing Wage Rate Unit at 971-245-3844, Option 2, or PWR.Email@boli.oregon.gov.

SPECIAL PROVISIONS

Project No. 650183 Title: Library / City Manager's Office Remodel Project

Description: Renovate approximately 11,000 SF of space to re-configure the current City Manager's offices and current library support services area. Scope includes moving/adding walls, replacing worn finishes, and moving/replacing existing casework. Project also renovates an approximately 2,500 SF office suite to support the re-location of the City Manager's offices. This will include creating new private offices, re-modelling the entry offices and conference room

B1. GENERAL

B 1.1 Project Description

See attached Book 2 Project set and Standard Drawings

B 1.2 Codes and Standards

1. All work shall be performed in accordance with the highest standard of practice in the industry and shall be furnished in conformance with all applicable codes, statutes or standards that apply to this work including, but not limited to, any applicable Federal, State or City of Springfield Codes, Standards and Ordinances.
2. **<https://www.oregon.gov/odot/Business/Specs/Specifications-Manual.pdf>**

END OF SECTION

FIRST-TIER SUBCONTRACTOR DISCLOSURE STATEMENT

ORS 279C.370 requires that bidders disclose to the City of Springfield certain first-tier subcontractors. When the contract value for a public improvement is greater than \$100,000, the bidder shall list below the names, the Construction Contractors Board number and location of place of business of each subcontractor who will be furnishing labor or labor and materials in connection with the public improvement and whose contract value is equal to or greater than:

five percent of the total project bid or \$15,000, whichever is larger; or
\$350,000 regardless of the percentage of the total project bid.

This form must be submitted at the location specified in the Invitation to Bid on the advertised bid closing date and within 2 working hours after the advertised bid closing time. This form must be submitted regardless of the use of subcontractors. Mark "None" in the subcontractor list if there are no subcontractors that need to be disclosed. Failure to submit this form by the disclosure deadline will result in a nonresponsive bid. A nonresponsive bid may not be considered for award.

**If the form is submitted separately from the bid it should be enclosed in an envelope marked:
"Subcontractor Disclosure Form Submitted for Project PXXXXX for (Bidder's Name)"**

Project Number: 650183
Project Title: Library / City Manager's Office Remodel Project

Bid Closing: Date: 10-26-2023 Time: 2:00 pm
Disclosure Deadline: Date: 10-26-2023 Time: 4:00 pm

Bidder's Name: _____
Bidder's Telephone Number: _____
Contact Person: _____

Check here if the bid amount less deductive alternates, if any, is \$100,000 or less. If the bid amount less deductive alternates, if any, is less than \$100,000 the remainder of the form does not need to be completed, but the form must still be submitted.

List below the *Name, Address, Telephone Number, Contact Person, and Construction Contractor Board (CCB) number* for each subcontractor that will be furnishing labor or labor and materials that are required to be disclosed, the category of work that the subcontractor will be performing, and the dollar amount of the subcontract. *(If needed, please attach additional sheets.)*

Firm Name:	
Address:	Contact Person:
City, State, Zip:	CCB Number:
Telephone:	Dollar Value:
Category of Work Provided:	

Firm Name:	
Address:	Contact Person:
City, State, Zip:	CCB Number:
Telephone:	Dollar Value:
Category of Work Provided:	

Firm Name:	
Address:	Contact Person:
City, State, Zip:	CCB Number:
Telephone:	Dollar Value:
Category of Work Provided:	

Firm Name:	
Address:	Contact Person:
City, State, Zip:	CCB Number:
Telephone:	Dollar Value:
Category of Work Provided:	

Firm Name:	
Address:	Contact Person:
City, State, Zip:	CCB Number:
Telephone:	Dollar Value:
Category of Work Provided:	

Firm Name:	
Address:	Contact Person:
City, State, Zip:	CCB Number:
Telephone:	Dollar Value:
Category of Work Provided:	

CITY OF SPRINGFIELD
Public Improvement Contracts
ORS 279C.375

FINANCIAL RESPONSIBILITY FORM

Organization Name: _____

Principal(s): _____
Name / Title

Address: _____

City: _____ State: _____ Zip: _____

Telephone: _____ FAX: _____

Email: _____

The information provided in this form is part of the City's inquiry concerning Bidder responsibility pursuant to ORS 279C.375 for public works/public improvement projects. Please print clearly or type.

Answer all questions. Submission of a form with unanswered questions, incomplete, or illegible answers may result in a finding that you are not a responsible Bidder. This document will become part of your response to the solicitation and will be subject to Oregon Public Records laws. Any information that may be considered confidential must be marked according to instructions in the solicitation document.

1. Is your company a Resident Oregon Bidder as defined in ORS 279A.120?

Resident Non-resident

Note: "Resident bidder" means a bidder that has paid unemployment taxes or income taxes in the state of Oregon during the 12 calendar months immediately preceding submission of the bid, has a business in this state and has stated in the bid whether the bidder is a "resident bidder".
ORS 279A.120(1)(b)

2. Contractor's Construction Board Number: _____ as required by ORS 701.055.
Expiration date: _____

3. Companies from whom you obtain surety bonds:

Surety Company #1
Name: _____
Contact Name: _____
Telephone: _____ FAX: _____
Present Amount of Bonding Coverage (\$): _____

Surety Company #2 (if needed)
Name: _____
Contact Name: _____
Telephone: _____ FAX: _____
Present Amount of Bonding Coverage (\$): _____

4. Has your application for Surety Bond ever been declined within the past 10 years?

Yes No

If yes, explain. _____

5. During the past two years, have you been charged with a failure to meet the claims of your subcontractors or suppliers?

Yes No

If yes, explain. _____

6. Has a judgment been entered against your company within the past 15 years finding it to be in breach of any contract for unperformed or defective work?

Yes No

If yes, explain. _____

7. Has any officer, employee or agent of your company ever been convicted of a criminal offense arising out of obtaining, attempting to obtain, or performing a public or private contract or subcontract?

Yes No

If yes, explain. _____

8. Has any officer, employee or agent of your company been convicted under state or federal law of embezzlement, theft, forgery, bribery, falsification or destruction of records, receiving stolen property or any other offense indicating a lack of business integrity or business honesty?

Yes No

If yes, explain. _____

9. Has your company or any officer, employee or agent of your company been convicted under state or federal antitrust laws?

Yes No

If yes, explain. _____

10. Has any officer or partner or principal of your organization ever been an officer, partner or principal of another Organization that failed to complete a construction contract?

Yes No

If yes, explain. _____

11. Indicate the total amount of work, expressed in dollars, your company reasonably believes it is capable of bonding at any one time: \$_____. What portion of this amount remains available at time of completion of this form? \$_____.
12. Has your firm ever been at any time in the last ten years the debtor in a bankruptcy proceeding?
 Yes No
If yes, explain. _____

13. Does your firm or any first tier subcontractors have any outstanding judgments pending against it?
 Yes No
If yes, explain. _____

14. In the past ten years, has your firm been a party to litigation, arbitration or mediation on a matter related to payment to subcontractors or work performance on a contract? Check "Yes" even if the matter proceeded to arbitration or mediation without court litigation.
 Yes No
If yes, explain. _____

15. Has any officer, partner, or principal of your company discontinued business operation with outstanding debts?
 Yes No
If yes, explain. _____

16. Have all officers, partners or principals of your company and, to the best to your knowledge, all applicable Subcontractors, complied with the tax laws of this state or a political subdivision thereof including, but not limited to, ORS 305.620 and ORS Chapters 316, 317 and 318?
 Yes No
If no, explain. _____

17. Complete the attached Experience/ Reference form, Attachment 1, for your firm and submit with bid package.
18. Include with bid package a list of other business entities in which the Principles of your firm are currently or have previously been involved with or financially obligated to during the past 5-10 years.

19. At the sole discretion of City prior to award, responsive bidders may be required to submit Financial Statements including but not limited to one or more of the following: Balance Sheet, Profit and Loss Statement, Statement of Cash Flow, and/or past tax returns for the most recent past two (2) years.

Declaration and Signatures

The undersigned hereby declares that he or she is duly authorized to complete and submit this Organization/Responsibility Form and that the statements contained herein are true and correct as of the date set forth below. The undersigned further agrees to provide additional financial statements (described in #20 above) upon request by City's Finance Director. Incomplete, incorrect or misleading information may be reason for a determination by the City of non-responsibility.

By: _____ Date: _____
(Signature of authorized official)

Name: _____ Title: _____
(Please type or print) (Please type or print)

For: _____
(Firm's name - Please type or print)

Business Organization: (Check one)

Corporation

Partnership

Joint Venture

Limited Liability Company

Sole Proprietorship

Other _____

Attachment 1

Current Contracts in Force/Previous Experience – minimum of three required of similar nature with public sector work.

Contract #1

Location (city/state)	
Owners Name	
Type of Work	
% Completed	
Estimated Completion Date	

Contract #2

Location (city/state)	
Owners Name	
Type of Work	
% Completed	
Estimated Completion Date	

Contract #3

Location (city/state)	
Owners Name	
Type of Work	
% Completed	
Estimated Completion Date	

References – minimum of two project owner references and two subcontractor references. References may be contacted to discuss submitting Contractor's qualifications.

#1 Project Owner Reference

Reference Name	
Business or Employer	
Telephone	
Project Name/\$ Amount	

#2 Project Owner Reference

Reference Name	
Business or Employer	
Telephone	
Project Name/\$ Amount	

#1 Subcontractor Reference

Reference Name	
Business or Employer	
Telephone	
Project Name/\$ Amount	

#2 Subcontractor Reference

Reference Name	
Business or Employer	
Telephone	
Project Name/\$ Amount	

**CERTIFICATION OF COMPLIANCE
STATEMENT OF NONDISCRIMINATION**

The undersigned bidder hereby certifies that the bidder has not discriminated, and will not, discriminate against a subcontractor in the awarding of a subcontract because the subcontractor is a minority, women or emerging small business enterprise certified under ORS 200.055 as required by ORS 279A.110.

Company Name *(Please Print)*

Bidder's Name *(Please Print)*

Bidder's Address	City	State	Zip
------------------	------	-------	-----

Bidder's Signature

Title

Date

Minority, Women, and Emerging Small Business/Disadvantaged Business Enterprise



MWESB/DBE Voluntary Self-Declaration for City Procurement # _____ or Project No. P _____

The City of Springfield is seeking information on the various business entities that submit bids and proposals for working with the City. We request that you provide the following information to assist us with evaluating our efforts at reaching the underrepresented sectors of the business and construction communities. The City does not intend to use this data as criteria for selecting the successful bidders or proposers for city-funded procurements. For procurements with state or federal DBE requirements, the City will use the forms and criteria established by the state or federal agency for selecting the successful bidders or proposers.

Please include this form with your bid/proposal submittal to the City.

Business Name: _____

Contact Person: _____

Business Address: _____

Business Phone: _____

Please check each box indicating the business certification type that your firm has with the State of Oregon or the federal government, if any:

- Oregon Minority-owned Business
- Oregon Woman-owned Business
- Oregon Emerging Small Business
- Federal Disadvantaged Business Enterprise (DBE)
- None of the above

CONFLICT OF INTEREST (COI) DISCLOSURE FORM

Firms under Contract or proposing to enter into a Contract with Agency must make disclosures required by law and as required by this form. Governing standards include but are not limited to the following State and Federal laws:

<u>*State Laws</u>	<u>*Federal Laws</u>
<ul style="list-style-type: none">• ORS Chapter 244• ORS 279C.307• OAR 137-048-0130• OAR 199 Division 5	<ul style="list-style-type: none">• 23CFR Part 636.116• 40CFR Part 1506.5(c)

*Some areas of the above laws include COI concepts that apply to design-build or other procurement types; however, Agency adopts those COI concepts and requires disclosures herein.

A Firm shall assure that any COI Disclosure Form it submits includes any information required to be disclosed by its Subcontractors and other Associates, on behalf of the Firm. A Firm may submit either the Subcontractors' separate COI Disclosure Forms or incorporate Subcontractor information into its own COI Disclosure Form.

See PART IV for Definitions applicable to this COI Disclosure Form.

This COI Disclosure Form is submitted in response to (check only one):

- Agency RFP# _____ [or] ITB# _____
- Contract # _____
- Price Agreement # _____ WOC# _____ [or] PO# _____
- Changes to COI Disclosure Form previously submitted for (RFP # _____, ITB # _____, Price Agreement # _____, WOC # _____, Contract # _____)

PART I - Certification

This COI Disclosure Form must be signed in ink by a principal of the Firm to certify that it is correct. My signature certifies that I am authorized to sign this COI Disclosure Form as a principal of the Firm and as disclosed on or attached to the present form:

- (a) the Firm's disclosures are complete, accurate, not misleading and do not omit any material information.
- (b) the Firm has provided the COI Disclosure Form to all Associates and Subcontractors (if any) and the present form includes or has attached any required COI disclosures from those sources.

Complete Legal Name of Firm: _____

Address: _____

Telephone: _____

Fax No: _____

Signature: _____ **Date:** _____

PART II - COI Disclosure Questions

Answer all questions "Yes", "No" or "N/A" (if uncertain answer "Yes.") in Part II. If the answer to any of the questions is "Yes," then use the applicable "Comments" fields to:

- (a) furnish all relevant facts that are necessary to make the response complete, accurate, and not misleading; and
- (b) identify any actions that must be taken to avoid, neutralize, or mitigate such conflict of interest (e.g. communications barriers, restraint or restriction upon future contracting activities, or other precaution)

1. a) Is any Associate of the Firm a former employee of Agency within the last year? **No** **Yes**
 b) Is any Associate of the Firm a Relative or Member of the Household of a current Agency employee that had or will have any involvement with this Procurement or Contract Authorization? **No** **Yes**
If the answer to either of the above questions is "Yes", complete Part III - Relatives and Former Agency Employees -Roles and Signatures table (section A and/or section B, as applicable).
2. Does the Firm or any Associate of the Firm have an Actual, Apparent or Potential Conflict Of Interest ("Individual" or "Organizational") with regard to any known member of an Agency procurement evaluation or selection team?
No **Yes** **Comments:**
3. Did the Firm or any Associate of the Firm conduct prior work on the Project described in the Procurement, or participate in preparing any part of the Procurement or any documents or reports related to the Procurement or to which the Procurement refers? **No** **Yes** **Comments:**
4. Does the Firm or any Associate of the Firm have any past, present or currently planned personal or financial interests which are an Actual, Apparent or Potential Conflict of Interest ("Individual" or "Organizational"), with respect to the Procurement or award of this Contract or performing the work for Agency? **No** **Yes**
Comments:
5. Has the Firm or an Associate of the Firm offered to a Public Official, or is the Firm aware of any Public Official that has solicited or received, directly or indirectly, any pledge or promise of employment or other benefit based on the understanding that the Public Official's vote, official action or judgment would be influenced thereby?
No **Yes** **Comments:**
6. Has (or will) the Firm or an Associate of the Firm provided a direct beneficial financial interest to any person within two years after the person ceased to hold a position as a Public Official who was involved in the Procurement or Authorization for the Contract, or is the Firm aware of any such person or Public Official who has or will receive a direct beneficial financial interest within the two year period?
No **Yes** **Comments:**
7. Is the Firm aware of any current or former Public Official that has an Actual, Apparent or Potential Conflict Of Interest with respect to the Procurement or award of this Contract or performing the work for Agency?
No **Yes** **Comments:**
8. Does the prospective Contract/WOC include development of an Environmental Assessment (EA) or Environmental Impact Statement (EIS)? **No** **Yes**
If yes, in accordance with the disclosure statement requirements of Council on Environmental Quality Regulation, 40 C.F.R 1506.5(c), does the Firm have any financial or other interest in the outcome of this Project; and/or does the Firm have any agreement, enforceable promise, or guarantee to provide any future work on this Project? **No** **Yes** **Comments:**
9. Have Subcontractors or other Associates furnished COI Disclosure Forms, separate from the present form, which included conflicts or potential conflicts of interest? (If yes, attach the disclosures.)
No **Yes** **N/A** **Comments:**
10. If the prospective Contract/WOC includes personal services for the purpose of administering, managing, monitoring, inspecting, evaluating compliance with or otherwise overseeing a public contract, is the Firm or an Associate or an Affiliate of the Firm a party to the subject public contract?
No **Yes** **N/A** **Comments:**
11. Has the Firm or any Associate of the Firm entered into personal services contract(s) with Agency for the purpose of advising or assisting in developing specifications, a scope or statement of work, an invitation to bid, a request for proposals or other solicitation documents and materials related to this procurement?
No **Yes** **Comments:**

PART III - Relatives and Former Agency Employees - Roles and Signatures

For each employee of the Firm that was employed by Agency within the last year, state in section A the job the employee performed for Agency, the role the employee now serves for the Firm and the date the employee left Agency. Use section B for Firm Associates with Relatives or Members of the Household working for Agency that had or will have involvement with this Procurement or Contract.

A: Employees that left Agency in the last year.			
Employee Name/Signature	Job Performed for Agency	Current Role with Firm	Date left Agency
Name: _____ Sign: _____ • Involved with this Procurement on behalf of Agency? No <input type="checkbox"/> Yes <input type="checkbox"/> • Involved with Proposal development for this Procurement? No <input type="checkbox"/> Yes <input type="checkbox"/>			
Name: _____ Sign: _____ • Involved with this Procurement on behalf of Agency? No <input type="checkbox"/> Yes <input type="checkbox"/> • Involved with Proposal development for this Procurement? No <input type="checkbox"/> Yes <input type="checkbox"/>			
Name: _____ Sign: _____ • Involved with this Procurement on behalf of Agency? No <input type="checkbox"/> Yes <input type="checkbox"/> • Involved with Proposal development for this Procurement? No <input type="checkbox"/> Yes <input type="checkbox"/>			
B: Identify Associates of the Firm that are Relatives or Members of the Household of Agency employees currently working for Agency, if the Agency employee had or will have any involvement with this Procurement or Contract.			
Firm Associate's Name	Name and Relationship of Relative or Member of Household Employed at Agency	Role at Agency	Agency employee's Role with this Procurement

(Make copies of this form as needed to list additional employees.)

PART IV - Definitions applicable to this COI Disclosure Form

“Actual Conflict Of Interest” means that an individual or Firm is unable to render impartial assistance or advice to Agency, has impaired objectivity in performing the Project work, or has an unfair competitive advantage. For purposes of ORS Chapter 244, and as defined in ORS 244.020(1), “Actual Conflict of Interest” means any action or any decision or recommendation by a person acting in a capacity as a public official, the effect of which *would be* to the private pecuniary benefit or detriment of the person or the person’s relative or any business with which the person or a relative of the person is associated unless the pecuniary benefit

or detriment arises out of the circumstances described in the ORS Chapter 244 definition for "Potential Conflict of Interest" (see definition below).

"Affiliate" (of the Firm) means a person or entity that, directly or indirectly through one or more intermediaries, controls, is controlled by or is under common control of the Firm.

"Agency" means the city or county conducting the procurement for which this COI Disclosure Form is required.

"Apparent Conflict Of Interest" means that an individual or Firm may reasonably be perceived to have an Actual Conflict of Interest or a Potential Conflict Of Interest.

"Associate" (of the Firm) means an employee, executive, director, key project personnel, consultant, contractor or Subcontractor, or any immediate family member of the foregoing.

"Authorization" (of the Contract). A public contract is authorized by a Public Official if the Public Official performed a significant role in the selection of a Firm or the execution of the Contract. A *significant role includes* recommending approval or signing of the Contract, including serving as a reference, recommending selection or serving on a selection committee or team, or having the final authorizing authority for the Contract.

"Bidder" means a legally operating business entity submitting a bid in response to a Procurement.

"Conflict Of Interest" or **"COI"** means an Individual Conflict Of Interest or Organizational Conflict Of Interest and includes an Actual, Potential, or Apparent Conflict Of Interest.

"COI Disclosure Form" means a manually signed disclosure of any Actual Conflict Of Interest, Apparent Conflict Of Interest or Potential Conflict Of Interest documented in the form of Agency's COI Disclosure Form.

"Contract" means an Agreement to Agree (ATA), Price Agreement (PA), Work Order Contract (WOC), Purchase Order (PO), or any other contract with Agency.

"Firm" means a Proposer or Bidder under a Procurement, a consultant or contractor under a Contract, or a Subcontractor at any tier of a Proposer, consultant, or contractor. A Firm includes all persons, individual or corporate, without regard to form of legal entity.

"Member of the Household" (of the Public Official) means any person who resides with the Public Official.

"Individual Conflict Of Interest" means that an individual has a conflict of interest because of a financial interest, gift, or other activities or relationships with other persons including but not limited to individuals with whom the individual has business, familial or household relationships.

"Interest" (in the context of a conflict of interest) means a direct or indirect interest and includes a personal as well as financial interest.

"Low-Level Document" means A&E, non-A&E and IT program or Project related documents which provide a basic understanding of a specific aspect of the program or Project. As referred to in 23CFR 636.116 with regard to A&E and related services, "the role of the consultant or subconsultant was limited to provision of preliminary design, reports, or similar "low-level" documents that will be incorporated into the RFP, and did not include assistance in development of instructions to offerors or evaluation criteria".

"Organizational Conflict Of Interest" means that a relationship or situation exists whereby a Firm or any of its Associates has past, present, or currently planned interests or activities that either directly or indirectly (through a client, contractual, financial, organizational or other relationship) may relate to the work to be performed under the proposed Contract with Agency and which (a) diminish the Firm's or an Associate's capacity to give impartial, technically sound, objective assistance or advice, (b) may impair the Firm's or an Associate's objectivity in performing the Contract, (c) may impair Agency's objectivity in oversight of the Contractor's performance, or (d) may result in an unfair competitive advantage. It does not include the normal flow of benefits from the performance of the Contract.

"Potential Conflict Of Interest" means that an individual or Firm, as a result of current plans, may reasonably be expected to have an actual conflict of interest. For purposes of ORS Chapter 244, and as defined in ORS 244.020(11), "Potential Conflict of Interest" means any action or any decision or recommendation by a person acting in a capacity as a public official, the effect of which *could be* to the private pecuniary benefit or detriment of the person or the person's relative, or a business with which the person or the person's relative is associated, unless the pecuniary benefit or detriment arises out of the following: (a) an interest or membership in a particular business, industry, occupation or other class required by law as a prerequisite to the holding by the person of the office or position.; (b) any action in the person's official capacity which would affect, to the same degree, a class consisting of all inhabitants of the state or a smaller class consisting of an industry, occupation or other group including one of which or in which the person, or the person's relative or business with which the person or the person's relative is associated, is a member or is engaged; or (c) membership in or membership on the board of directors of a nonprofit corporation that is tax-exempt under section 501(c) of the Internal Revenue Code.

"Public Disclosure" means the work product or service (in connection with the preparation of a Procurement) is available for public review and analysis for a reasonable amount of time, typically at least thirty (30) calendar days.

"Public Official" means any person who is serving the State of Oregon or any of its political subdivisions or any other public body as defined in ORS 174.109 as an elected official, appointed official, employee, agent or otherwise, irrespective of whether the person is compensated for the services. (All Agency employees are Public Officials.)

"Relative" (of a Public Official) means:

- the Public Official's spouse or domestic partner;
- the children, siblings, spouses of siblings or parents of the Public Official or the Public Official's spouse; or
- any individual for whom the Public Official has a legal support obligation or for whom the Public Official provides benefits arising from the Public Official's public employment or from whom the Public Official receives benefits arising from that individual's employment.

"Subcontractor" means a subcontractor or subconsultant at any tier.

"Transportation Project" or **"Project"** means any proposed or existing undertaking pertaining to highways, bridges, motor carriers, motor vehicles, public transit, rail, transportation safety, information systems, and such other programs related to transportation that are assigned to Agency under applicable law.



CITY OF SPRINGFIELD
Development and Public Works

NON-COLLUSION AFFIDAVIT

STATE OF _____)
) SS.
COUNTY OF _____)

_____ being first duly sworn, on oath says that the bid submitted to which this affidavit is a part, is a genuine and not a sham or collusion bid, or made in the interest of or on behalf of any person not therein named; and that the person, firm, association, joint venture, partnership, co-partnership or corporation herein named, has not directly or indirectly induced or solicited any Bidder to put in a sham bid, nor directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competition bidding in the preparation and submission of a bid for consideration in the award of a Contract for the **“S. 28th Street Sanitary Sewer Extension”** sought by the **CITY OF SPRINGFIELD** described in the Contract Documents of which this affidavit is a part; and that said Bidder has not in any manner sought by collusion to secure to self an advantage over any other Bidder or Bidders.

(Bidder)

SUBSCRIBED AND SWORN TO before this _____ day of _____, 20 ____.

(Signature)

(Print Name)

Notary Public in and for the State of _____

My commission expires: _____

NOTE: This form must be completed and submitted with the bid.



AIA Document A310™ – 2010

Bid Bond

CONTRACTOR:

(Name, legal status and address)

SURETY:

(Name, legal status and principal place of business)

OWNER:

(Name, legal status and address)

BOND AMOUNT:

PROJECT:

(Name, location or address, and Project number, if any)

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

The Contractor and Surety are bound to the Owner in the amount set forth above, for the payment of which the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if the Owner accepts the bid of the Contractor within the time specified in the bid documents, or within such time period as may be agreed to by the Owner and Contractor, and the Contractor either (1) enters into a contract with the Owner in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to the Owner, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) pays to the Owner the difference, not to exceed the amount of this Bond, between the amount specified in said bid and such larger amount for which the Owner may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise remain in full force and effect. The Surety hereby waives any notice of an agreement between the Owner and Contractor to extend the time in which the Owner may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding sixty (60) days in the aggregate beyond the time for acceptance of bids specified in the bid documents, and the Owner and Contractor shall obtain the Surety's consent for an extension beyond sixty (60) days.

If this Bond is issued in connection with a subcontractor's bid to a Contractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

Signed and sealed this _____ day of _____

(Witness)

(Principal)

(Seal)

(Title)

(Witness)

(Surety)

(Seal)

(Title)

CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.

Init.

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061110



Document A310™ – 2010 Instructions

Bid Bond

GENERAL INFORMATION

Purpose. AIA Document A310–2010 establishes the maximum penal amount that may be due the Owner if the Bidder fails to execute the contract and to provide the required performance and payment bonds, if any. It provides assurance that, if a bidder is offered a contract based on its tendered proposal but fails to enter into the contract, the Owner will be paid the difference in cost to award the contract to the next qualified bidder, so long as the difference does not exceed the maximum penal amount of the bond.

Related Documents. A310 is not incorporated by reference into other AIA documents. For further reference on bonding procedures, see AIA Document A701™–1997, Instructions to Bidders; and AIA Document G612™–2001, Owner's Instructions to Architect.

Use of Non-AIA Forms. AIA Document A310 may be used with any appropriate AIA or non-AIA document. CAUTION SHOULD BE EXERCISED BEFORE ITS USE TO VERIFY ITS COMPLIANCE WITH CURRENT LAWS AND REGULATIONS BY CONSULTING WITH AN ATTORNEY OR A BOND SPECIALIST.

USING A310–2010

Modifications. Particularly with respect to professional or contractor licensing laws, bonding codes, taxes, monetary and interest charges, arbitration, indemnification, format and font size, AIA Contract Documents may require modification to comply with state or local laws. Users are encouraged to consult an attorney before completing or modifying a document.

In a purchased paper AIA Contract Document, necessary modifications may be accomplished by writing or typing the appropriate terms in the blank spaces provided on the document or by attaching Supplementary Conditions, special conditions or referenced amendments.

Modifications directly to purchased paper AIA Contract Documents may also be achieved by striking out language. However, care must be taken in making these kinds of deletions. Under NO circumstances should standard language be struck out to render it illegible. For example, users should not apply blocking tape, correction fluid or Xs that would completely obscure text. Such practices may raise suspicion of fraudulent concealment, or suggest that the completed and signed document has been tampered with. Both parties should initial handwritten changes.

Using AIA software, modifications to insert information and revise the standard AIA text may be made as the software permits.

By reviewing properly made modifications to a standard AIA Contract Document, parties familiar with that document can quickly understand the essence of the proposed relationship. Commercial exchanges are greatly simplified and expedited, good faith dealings encouraged, and otherwise latent clauses are exposed for scrutiny.

AIA Contract Documents may not be retyped or electronically scanned. Retyping can introduce typographic errors and cloud legal interpretation given to a standard clause. Furthermore, retyping and electronic scanning are not permitted under the user's limited license for use of the document, constitute the creation of a derivative work and violate the AIA's copyright.

Identification of the Parties. The Contractor, the Surety, and the Owner should be identified using their respective full names and addresses or legal titles under which the bond is to be executed. The state in which the Surety is incorporated also should be identified in the space provided.

Bond Amount. The dollar amount of the bond should be provided in both written and numerical form.

Project Description. The proposed project should be described in sufficient detail to identify (1) the official name or title of the facility; (2) the location of the site; (3) the proposed building type, size, scope or usage; and (4) the project number required by the owner, if any. A project number may be required by certain public owners to adequately identify the project to which the bond pertains.

Execution of the Bond. The bond must be signed by both the Contractor and the Surety. The parties executing (signing) the bond should print their title and impress their corporate seal, if any. Where appropriate, attach a copy of the resolution or bylaw authorizing the individual to act on behalf of the firm or entity. As to the Surety, this usually takes the form of a power of attorney issued by the Surety company to the bond producer (agent) who signs on its behalf.



AIA Document A312™ – 2010

Performance Bond

CONTRACTOR:

(Name, legal status and address)

SURETY:

(Name, legal status and principal place of business)

OWNER:

(Name, legal status and address)

CONSTRUCTION CONTRACT

Date:

Amount:

Description:

(Name and location)

BOND

Date:

(Not earlier than Construction Contract Date)

Amount:

Modifications to this Bond: None See Section 16

CONTRACTOR AS PRINCIPAL

Company: *(Corporate Seal)*

SURETY

Company: *(Corporate Seal)*

Signature: _____

Name
and Title:

(Any additional signatures appear on the last page of this Performance Bond.)

Signature: _____

Name
and Title:

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or BROKER:

OWNER'S REPRESENTATIVE:

(Architect, Engineer or other party.)

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

AIA Document A312-2010 combines two separate bonds, a Performance Bond and a Payment Bond, into one form. This is not a single combined Performance and Payment Bond.

§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

§ 2 If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Section 3.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after

- .1 the Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Section 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;
- .2 the Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and
- .3 the Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

§ 4 Failure on the part of the Owner to comply with the notice requirement in Section 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

§ 5 When the Owner has satisfied the conditions of Section 3 the Surety shall promptly and at the Surety's expense take one of the following actions:

§ 5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

§ 5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

§ 5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety company, to be identical to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Section 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

§ 5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

- .1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or
- .2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

§ 6 If the Surety does not proceed as provided in Section 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Section 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

§ 7 If the Surety elects to act under Section 5.1, 5.2 or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication, for

- .1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;
- .2 additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Section 5; and
- .3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

§ 8 If the Surety elects to act under Section 5.1, 5.3 or 5.4, the Surety's liability is limited to the amount of this Bond.

§ 9 The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors and assigns.

§ 10 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 11 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 a declaration of Contractor Default or within two years after the Contractor ceases working or within two years after the 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 as a defense in the jurisdiction of the suit shall be applicable.

§ 12 Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

§ 13 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision of this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 14 Definitions

§ 14.1 **Balance of the Contract Price.** The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

§ 14.2 **Construction Contract.** The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

§ 14.3 **Contractor Default.** Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

§ 14.4 **Owner Default.** Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 14.5 **Contract Documents.** All the documents that comprise the agreement between the Owner and Contractor.

§ 15 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 16 Modifications to this bond are as follows:

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL

SURETY

Company:

(Corporate Seal)

Company:

(Corporate Seal)

Signature: _____

Name and Title: _____


Address _____

Signature: _____

Name and Title: _____

Address _____

CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.

 **AIA**® Document A312™ – 2010

Payment Bond

CONTRACTOR:
(Name, legal status and address)

SURETY:
(Name, legal status and principal place of business)

OWNER:
(Name, legal status and address)

CONSTRUCTION CONTRACT
Date:

Amount:

Description:
(Name and location)

BOND
Date:
(Not earlier than Construction Contract Date)

Amount:

Modifications to this Bond: None See Section 18

CONTRACTOR AS PRINCIPAL
Company: *(Corporate Seal)*

SURETY
Company: *(Corporate Seal)*

Signature: _____
Name and Title:
(Any additional signatures appear on the last page of this Payment Bond.)

Signature: _____
Name and Title:

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or BROKER:

OWNER'S REPRESENTATIVE:
(Architect, Engineer or other party:)

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

AIA Document A312–2010 combines two separate bonds, a Performance Bond and a Payment Bond, into one form. This is not a single combined Performance and Payment Bond.

§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

§ 2 If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Section 13) of claims, demands, liens or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety.

§ 4 When the Owner has satisfied the conditions in Section 3, the Surety shall promptly and at the Surety's expense defend, indemnify and hold harmless the Owner against a duly tendered claim, demand, lien or suit.

§ 5 The Surety's obligations to a Claimant under this Bond shall arise after the following:

§ 5.1 Claimants, who do not have a direct contract with the Contractor,

- .1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were or equipment was, furnished or supplied or for whom the labor was done or performed within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
- .2 have sent a Claim to the Surety (at the address described in Section 13).

§ 5.2 Claimants, who are employed by or have a direct contract with the Contractor, have sent a Claim to the Surety (at the address described in Section 13).

§ 6 If a notice of non-payment required by Section 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Section 5.1.1.

§ 7 When a Claimant has satisfied the conditions of Sections 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

§ 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

§ 7.2 Pay or arrange for payment of any undisputed amounts.

§ 7.3 The Surety's failure to discharge its obligations under Section 7.1 or Section 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Section 7.1 or Section 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

§ 8 The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Section 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

§ 9 Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

§ 10 The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to, or give notice on behalf of, Claimants or otherwise have any obligations to Claimants under this Bond.

§ 11 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 12 No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Section 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 13 Notice and Claims to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

§ 14 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 15 Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

§ 16 Definitions

§ 16.1 Claim. A written statement by the Claimant including a minimum:

1. the name of the Claimant;
2. the name of the person for whom the labor was done, or materials or equipment furnished;
3. a copy of the agreement or purchase order pursuant to which labor, materials or equipment was furnished for use in the performance of the Construction Contract;
4. a brief description of the labor, materials or equipment furnished;
5. the date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
6. the total amount claimed by the Claimant for labor, materials or equipment furnished as of the date of the Claim;
7. the total amount of previous payments received by the Claimant; and
8. the total amount due and unpaid to the Claimant for labor, materials or equipment furnished as of the date of the Claim.

§ 16.2 Claimant. An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

§ 16.3 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

§ 16.4 **Owner Default.** Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 16.5 **Contract Documents.** All the documents that comprise the agreement between the Owner and Contractor.

§ 17 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 18 Modifications to this bond are as follows:

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL

Company:

(Corporate Seal)

SURETY

Company:

(Corporate Seal)

Signature: _____

Name and Title: _____

Address _____

Signature: _____

Name and Title: _____

Address _____

CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.

Authorization to Legally Bind Bidder

The person executing this Bid and the instruments referred to herein on behalf of the Bidder has the legal power, right, and actual authority to submit this Bid, and to bind the Bidder to the terms and conditions of this Bid.

(Signature of person authorized to bind Bidder)

Dated

Print Name of Person signing as authorized to bind Bidder

Title of Person signing as authorized to bind Bidder

Firm Name

Phone

Address

Fax

City, State, Zip

email address

Book 2 Project set and Standard Drawings

CITY OF SPRINGFIELD Springfield City Hall City Manager's and Library Remodel

Project Manual

CONSTRUCTION DOCUMENTS

September 28, 2023



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END OF SECTION

**SECTION 00 0101
PROJECT INFORMATION**

PROJECT INFORMATION

PROJECT NAME

Springfield City Hall City Manager's Office and Library Remodel

DATE OF ISSUE

Construction Documents – September 28, 2023

PROJECT OWNER

City of Springfield

ARCHITECT

PIVOT Architecture, 44 West Broadway, Suite 300, Eugene, OR 97401

Phone: (541) 342-7291

Architect of Record: John Stapleton

Email: jstapleton@pivotarchitecture.com

Contact: Katie D. Hall, khall@pivotarchitecture.com

DIV 01 - GENERAL REQUIREMENTS

1. General Conditions – The General Contractor will be responsible for the following project management and general conditions.
2. Conform to Owner-Contractor Agreement General Conditions and as noted here.
3. Contractor to verify all measurements and quantities by visiting the project site and becoming familiar with the conditions affecting the work prior to construction. Notify Architect of any discrepancies.
4. In addition to the general notes and specifications detailed in this drawing set, all work & materials shall conform to the current state building codes and all laws and ordinances.
5. PIVOT will apply for the City of Springfield Building Permit and the Owner will pay the Permit Fee and any Systems Development Charges. The Contractor shall arrange for and pay for any additional permits and fees associated with this project.
6. The Contractor shall arrange for any required special inspections and testing. The Owner will pay for inspection and testing fees.
7. Hazardous materials: if, during the work of this project, hazardous material is located or suspected, stop work, clear the area, and notify the Owner immediately for further direction.
8. Protect existing elements of the building and site not scheduled to be improved or altered as part of this project.
9. Provide all required traffic barriers both interior and exterior as well as safety signs and markers.
10. Structural Conditions: Report questionable structural conditions to the Architect.
11. All existing site and building utilities identified on the drawings are not intended to be exact or complete. It shall be the responsibility of the Contractor to identify all utilities and protect as required during the course of construction.
12. Maintain safe light levels in all work areas. Conform to applicable codes.

13. Requests for substitution of specified products should be sent to the Architect along with a standard CSI Substitution request form and substantiating product information indicating equivalency and performance of alternate product.
14. Maintain one set of record drawings at the site at all times indicating significant detail and dimension changes made during construction. Furnish to the Owner upon project completion. Locate any buried or concealed utilities not shown on plans.
15. Provide operating and maintenance data, warranties, bonds and maintenance contracts prior to substantial completion of the work.
16. At the completion of the work, clean all sight exposed surfaces and leave project clean and ready for occupancy. Employ experienced workers or professional cleaners for final cleaning. Remove grease, dust, dirt, stains and labels except on exposed surfaces. Polish, patch and touch-up marred surfaces to specified finish. Clean mechanical equipment, ductwork and replace filters. Clean electrical work, including light fixtures.
17. Support all work, including but not limited to: ceilings, lights, partitions, piping in accordance with requirements for seismic zone D.
18. Required Submittals, Shop Drawings and Product Data:
 - A. Provide shop drawings and product data for Architect's review of the following materials:
 - B. Architectural Wood Casework: Submit product information, samples and shop drawings indicating materials, component profiles and elevations, fastening methods, joint details, connections to adjacent work, schedule of finishes, and accessories.
 - C. Metal Wall Panels: Submit product information and shop drawings indicating dimensions, layout, joints, construction details, methods of anchorage, flashings, terminations. Submit (2) samples 12 x 12 inch in size illustrating finish color, sheen, and texture.
 - D. Doors and Door Frames: Submit product information and shop drawings.
 - E. Aluminum-Framed Storefronts: Submit product information and shop drawings indicating system dimensions, framed opening requirements and tolerances, affected related work, expansion and contraction joint location and details, and field welding required. Submit (2) samples 6 x

- 6 inches in size illustrating finished aluminum surface, glass, and glazing materials.
- F. Interior Aluminum Service Window: Submit product information, samples and shop drawings for fabrication and installation of windows. Include details, elevations and installation requirements of finish hardware and cleaning.
 - G. Door Hardware: Submit product information and door schedule.
 - H. Acoustic Ceilings: Provide data on suspension system components, acoustical units, and seismic restraint components including perimeter clips. Submit (2) samples 6 x 6 inch in size illustrating material and finish of acoustical units.
 - I. Wood Ceilings: Submit product information, samples and shop drawings. Coordinate layout and installation of wood panels and suspension system components with other construction elements that penetrate the ceilings or are supported by them.
 - J. Resilient Flooring: Submit product information, samples and shop drawings that indicate seaming plan, location of edge strips and floor pattern as applicable.
 - K. Tile Carpeting: Submit product information, samples and shop drawings indicating layout of joints, direction of carpet pile and location of edge moldings.
 - L. Acoustical Wall Panels: Submit product information, samples and shop drawings with fabrication and installation details, panel layout and fabric orientation.
 - M. Painting and Coating: Submit product information, (3) paper draw down samples and paint schedule of proposed assemblies.
 - N. Countertops: Submit product information, samples and shop drawings with complete details of materials and installation. Combine with shop drawings of cabinets and casework specified in other sections.
 - O. Upholstered Seating: Provide (2) fabric samples of each color.

19. Delegated Design Requirements

- A. Certain components of the Work under this project are Delegated Design. It is the Contractor's responsibility to coordinate and assume or assign to subcontractors the complete responsibilities for the design, calculation, submittals, fabrication, transportation and installation of the Delegated Design portions or components as required. Delegated Design components of the work are defined as complete operational systems, provided for their intended use.
- B. Submit deferred submittals for delegated design elements to the governing agency for the separate approval of each Delegated Design

item as defined in Required Submittals, Shop Drawings and Product Data.

- C. Owner shall not be responsible to pay for any delays, additional products, additional hours of work or overtime, restocking or rework required due to failure by the Contractor or the subcontractor to coordinate their work with the work of the other trades on the project or to provide the Delegated Design portion or component in a timely manner to meet the schedule of the project.
- D. Delegated Design components include, but are not limited to the following:
 - a. Aluminum Storefront, Section 08 4313 - Aluminum-Framed Storefronts.
 - b. Fire Suppression, Division 21.
 - c. Mechanical, Division 23.
 - d. Electrical, Division 26.
 - e. Fire Alarm System, Division 28.
 - f. Additional requirements from specific sections.

20. Alternates

- A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in the Owner-Contractor Agreement.
- B. Coordinate Related work and modify surrounding work to integrate the Work of each Alternate.

21. Schedule of Alternates:

- A. Alternate L-1: Library Lunchroom casework. Alternate is additive.
 - a. Under Base Bid - Existing casework, flooring and base in Library LUNCH ROOM 328 remains as is.
 - b. Under Alternate: Demolish existing flooring, base, casework, dishwasher, stove and sink in Library LUNCH ROOM 328.
 - 1. Provide new casework and counter for LUNCH ROOM 328. See drawings for casework elevations.
 - 2. Casework and counter materials similar to CM Offices. Architect to select from standard color options.
 - 3. Provide new vinyl flooring in LUNCH ROOM 328.
 - 4. Provide new rubber base in LUNCH ROOM 328.

B. Alternate L-2: Library circulation desk ceiling. Alternate is additive.

- a. Under Base Bid - Existing ceilings to remain. Provide new LED

Panel light fixtures in 2x4 lay-in ceiling.

b. Under Alternate:

1. Remove existing ceiling tiles.
2. Replace with wood ceiling panels as shown in drawings.
3. Provide Class 1(A) Fire Rated black backing material above ceiling panels.
4. Provide new LED linear pendant fixtures, see Electrical.
5. Provide new sprinkler heads, see Plumbing.

C. Alternate L-3: Library Staff, Workroom, Offices and Conference Room carpet. Alternate is additive.

a. Under Base Bid - Existing carpet and base to remain in WORKROOM 323, LIBRARY STAFF 325, OFFICE 325A, OFFICE 325B, CONFERENCE 401, OFFICE 404, OFFICE 407, OFFICE 409, OFFICE 410, OFFICE 411, and OFFICE 413. Protect in place. Construction of walls for IT OFFICE 325B is not included in base bid.

b. Under Alternate:

1. Remove existing carpet and rubber base in WORKROOM 323, LIBRARY STAFF 325, OFFICE 325A, OFFICE 325B, CONFERENCE 401, OFFICE 404, OFFICE 407, OFFICE 409, OFFICE 410, OFFICE 411, and OFFICE 413. Coordinate with Owner regarding salvaged carpet for its possible re-use in other parts of the Library.
2. Construct new walls for IT OFFICE 325B as shown in drawings.
3. Walls to be constructed to underside of existing ceiling. Provide acoustic gasket at top of wall and 2 feet of 3 inch batt insulation on each side of wall on top of ceiling tiles.
4. Provide new carpet for WORKROOM 323, LIBRARY STAFF 325, OFFICE 325A, OFFICE 325B, CONFERENCE 401, OFFICE 404, OFFICE 407, OFFICE 409, OFFICE 410, OFFICE 411, and OFFICE 413.
5. Provide new vinyl flooring in WORKROOM 323. Provide vinyl similar to CM Offices. Architect to select from standard color options.
6. Provide new rubber base in WORKROOM 323, LIBRARY STAFF 325, OFFICE 325A, OFFICE 325B, CONFERENCE 401, OFFICE 404, OFFICE 407, OFFICE 409, OFFICE 410, OFFICE 411, and OFFICE 413.

- E. Alternate L-4: Teen Area upholstery. Alternate is additive.
 - a. Under Base Bid - Leave existing furniture as is. Relocate furniture for staff. Coordinate all relocation of Owner furniture with Owner's representative.
 - b. Under Alternate - Provide new-upholstery for Owner's existing furniture as shown in the drawings:
 - Teen Space Booth
 - Teen Space Arm Chairs

22. Substantial Completion:

- A. Conduct inspection and prepare list of Work to be completed or corrected.
- B. Assist Architect in review of Contractor's inspection list and generation of substantial completion punch list.
- C. Supervise correction and completion of Work as established in Architect's Observation Reports and substantial completion punch list.
- D. Apply for and receive Final Occupancy Permit from Building Department.
- E. Complete submittal of Operations and Maintenance Manuals.
- F. Record Documents: At the completion of the Work, Contractor to provide record as-built drawings showing all deviations from Contractor documents. All drawings should be consolidated into one set and submitted to the Architect and design team for review and comment. Record documents should be submitted to the Owner prior to final payment.
- G. Complete Owner Training.

END OF SECTION

DIV 02 - DEMOLITION

1. See drawings for limits of interior demolition.
2. Protect building structure to remain during demolition process.
3. Coordinate with Design/Build subcontractors.
4. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.
5. Salvage for reuse in the project items as noted on the drawings.
6. Partial removal of concrete walls: Neatly saw cut at right angle to surface.
7. Surface Repair - Match existing surfaces and finishes.
8. Protect all existing ceilings and ceiling tiles during demolition and construction, unless noted otherwise in the drawings. Remove ceiling tiles as needed prior to new construction to accomplish work. Any damaged ceiling tiles in area of work require replacement.

END OF SECTION

SECTION 05 4000

EXTERIOR COLD-FORMED METAL FRAMING

1. Cold form steel used for studs, track, blocking, gussets, brace straps, etc. shall meet the requirements of the steel stud manufacturers association (SSMA) ES Evaluation Report No. 3064P dated February 2020. See detail sheets for sizes and thickness requirements.
2. Cold form steel stud framing shall conform to the following:
 - A. 54 mil and heavier-ASTM A653 SS (50 ksi minimum yield).
 - B. 43 mil and lighter-ASTM A653 SS (33 ksi minimum yield).
 - C. Exterior members: Galvanized G60 min.
3. All steel studs, joist and track shall have a legible label, stamp or embossment, at a maximum of 48 inch O.C., indicating the manufacturer's name, logo or initials, evaluation service report number, the material base metal thickness (uncoated) in .001 inch and the yield strength if different than 33 ksi.
4. Mill certificates from the coil producer shall be made available if requested. Mill certificate to include as a minimum the chemical composition, yield strength, tensile strength, elongation, and coating thickness.
5. All sections to remain unpunched except wall studs may be punched in accordance with ICC hold size and spacing limitations.
6. Cold form steel studs shall have full bearing against inside track web prior to stud and track attachment. Studs and tracks shall be attached by welding or (2) #8 self-drilling screws (one each flange).
7. Self-drilling fasteners have been designed in accordance with AISI "Specification Provisions for Screw Connections." Fasteners shall be #8 SMS U.O.N. all screws to be galvanized or corrosion resistant. Screws shall conform to S.A.E. J78.

END OF SECTION

SECTION 06 1000

ROUGH CARPENTRY

1. Install blocking and backing at all wall mounted casework, equipment and furniture that is shown on drawings.

END OF SECTION

SECTION 06 2000

FINISH CARPENTRY

1. Softwood Lumber:
 - A. Unless otherwise indicated provide products of quality specified by AWI/AWMAC/WI Architectural "Woodwork Standards for Custom Grade".

2. Interior Wood Work Items:
 - A. Wall Paneling (WP-1): Species and finish to be selected by Architect.

END OF SECTION

SECTION 06 4100

ARCHITECTURAL WOOD CASEWORK

1. Cabinets:
 - A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMCA/WI (NAAWS), unless noted otherwise.
 - B. Cabinets:
 - a. Finish - Exposed Exterior Surfaces: Decorative laminate.
 - b. Finish - Exposed Interior Surfaces: Decorative laminate.
 - c. Finish - Semi-Exposed Surfaces: Decorative laminate.
 - d. Finish - Concealed Surfaces: Manufacturer's option.
 - e. Door and Drawer Front Edge Profiles: Square edge with thin applied band.
 - f. Casework Construction Type: Type A - Frameless.
 - g. Adjustable Shelf Loading: 50 lbs. per sqft.
 - C. Laminate Materials
 - a. Manufacturers: Wilsonart or approved. Colors and finish as indicated on Finish and Materials Legend.
 - b. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications.
 - D. Hardware
 - a. Adjustable Shelf Supports: Standard side-mounted system using multiple holes for pin supports and coordinated self-rests, polished chrome finish, for nominal 1 inch spacing adjustments.
 - b. Drawer and Door Pulls: "Bar" shaped wire pull, steel with satin finish, 4 inch centers.
 - c. Hinges: European style concealed self-closing type, 170 degree opening angle, steel with polished finish.
 - d. Coordinate with Owner during submittals for drawers and casework requiring locks. Assume (12) locks total.
 - e. Countertop Support Brackets:
 - Type - 1: Fixed, L-shaped, face-of-stud mounting. Basis of Design: Centerline Brackets; Front Mounting Plus Countertop Support.
 1. Materials: Steel; T-shape cross-section.
 - A. Finish Manufacturer's standard, factory-applied, powder coat.

- B. Color: Black.
- C. Height: 14 inches.
- D. Support Length: 20 inches.
- E. Width: 2 1/2 inches.
- Type - 2: L-shaped, top of pony wall mounting. Basis of Design: Centerline Brackets; "Forward L Bracket"
 1. Materials: Steel; T-shape cross-section.
 - A. Finish Manufacturer's standard, factory-applied, powder coat.
 - B. Color: Black.
 - C. Height:
 - D. Support Length:
 - E. Width: 2 1/2 inches

END OF SECTION

SECTION 07 2100

THERMAL INSULATION

1. Applications:
 - A. Insulation Over Metal Stud Framed Walls, Continuous: Mineral Fiber board.
 - B. Insulation in Metal Framed Walls: Batt insulation with separate vapor retarder.
2. Mineral Fiberboard Insulation: Rigid or semi-rigid mineral fiber, ASTM C612 or ASTM C553; unfaced flame spread index of 0 (zero) when tested in accordance with ASTM E84.
 - A. Smoke Developed Index: 0 (zero), when tested in accordance with ASTM E84.
 - B. Board Size: 16 by 48 inches, or as required
 - C. Board Thickness: 2 inches, or as required to achieve thickness indicated on drawings.
 - D. Thermal Resistance: R-value of 4.3 per inch, minimum, at 75 degrees F, minimum, when tested according to ASTM C518
3. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.
 - A. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
 - B. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
 - C. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.
 - D. Formaldehyde Content: Zero
 - E. Facing: Aluminum foil, flame spread 25 rated; one side.
 - F. Manufacturers: CertainTeed Corporation, John Manville, Knauf Insulation GmbH, Owens Corning Corp
 - G. Extent of Work: Cavity of new exterior walls R-13
4. Batt Insulation Vapor Retarder: Polyimide film vapor retarder that changes permeance with change in humidity; CertainTeed MemBrain or approved.
 - A. Vapor Retarder Class: Class II
 - B. Water Vapor Permeance: ASTM E 96, dry cup method: 1.0 perms or less. ASTM E 96, wet cup method: 10.0 perms or greater.

- C. Fire Hazard Classification: ASTM E 84. Maximum Flame Spread Index: 20. Maximum Smoke Developed Index: 55.
- D. Extent: Over thermal batt insulation at interior side of all exterior walls.

END OF SECTION

SECTION 07 2500

WEATHER BARRIERS

1. Water-Resistive Barrier: Provide on exterior walls under exterior cladding. Submit all weather barrier products as a whole system all from one manufacturer.
2. Air Barrier: Provide on outside surface of sheathing of exterior walls.
 - A. Sheet-Applied, Vapor Permeable Water Resistive Air Barrier: reinforced, modified polyolefin tri-laminate film surface and permeable adhesive with split-back poly-release film; having the following typical physical properties:
 - a. Air Permeance: 0.004 cfm/sq ft, maximum, when tested in accordance with ASTM E2178. Water Vapor Permeance: 29 perms, minimum, when tested in accordance with ASTM E96/E96M Procedure A (desiccant procedure).
 - b. Water Penetration Resistance Around Nails: Pass, when tested in accordance with ASTM D1970/D1970M (modified).
 - c. Ultraviolet (UV) and Weathering Resistance: Approved in writing by manufacturer for up to 90 days of weather exposure.
 - d. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less (Class A), when tested in accordance with ASTM E84.
 - e. Water Resistance: Comply with applicable water-resistive requirements of ICC-ES AC38.
 - f. Nail Sealability (ASTM D1970): Pass
 - g. Dry Tensile Strength (ASTM D882): 41 lbf/182 N MD; 29 lbf/129N CD
3. Basis of Design: Henry Company; Blueskin VP160.
4. Accessories:
 - A. Sealants, Primers, Tapes, and Accessories for sealing Weather Barrier and sealing Weather Barrier to adjacent substrates is compatible with specified sheet-applied weather barrier and as recommended by Weather Barrier manufacturer for project conditions.
 - B. Opening flashings, sill flashings, through-wall flashings, and transition membranes: Type compatible with air barrier material and part of manufacturer's approved assembly.

END OF SECTION

SECTION 07 4213

METAL WALL AND SOFFIT PANELS

1. Basis of Design: Taylor Metal Products
2. Other Acceptable Manufacturers: AEP Span
3. Wall Panel System: Factory fabricated prefinished metal panel system, site assembled.
4. Exterior Panels:
 - A. Profile: 1" x 12 5/8" Smooth Wall.
 - B. Pattern:
 - a. Wall Panel: Single V-Groove.
 - b. Soffit Panel: Lifetime Soffit Flat Panel.
 - C. Material: 22 gauge Kynar 500 precoated steel
 - D. Panel Height: See drawings, maximum height of 12'.
 - E. Accessories:
 - Backer: Polystyrene Backer (to minimize oil canning).
 - Anchorage: Concealed Fasteners.

END OF SECTION

SECTION 07 8400

FIRE STOPPING

1. Floor-to-Floor, Wall-to-Wall, and Wall-to-Floor Joints, Except Perimeter, Where Both Are Fire-Rated: Use system that has been tested according to ASTM E1966 or UL 2079 to have fire resistance F rating equal to required fire rating of the assembly in which the joint occurs.
 - A. Movement: Provide systems that has been tested to show movement capability as indicated.

2. Through Penetration Firestopping: Use system that has been tested according to ASTM E814 to have fire resistance F Rating equal to required fire rating of penetrated assembly.
 - A. For penetrations by combustible items including: insulated metal pipe, jacketed PVC, flexible cable or cable bundles, cable trays, and plastic pipe, an intumescent material is required to maintain fire rating of the assembly penetrated.

END OF SECTION

SECTION 07 9005

JOINT SEALERS

1. Sealants and Primers: Provide only products having lower volatile organic compound (VOC) content than required by South Coast Air Quality Management District Rule No.1168.
2. General Purpose Interior Sealant: Acrylic emulsion latex, ASTM C834, Type OP, Grade NF single component, paintable
 - A. Color: To be selected by Architect from manufacturer's standard range.
 - B. Product: Sonolac manufactured by Sonneborn or equal.
 - C. Applications:
 - a. Interior walls and ceiling control joints.
 - b. Joints between door and window frames and wall surfaces.
 - c. Other interior joints for which no other type of sealant is indicated.

END OF SECTION

SECTION 08 1113

HOLLOW METAL DOORS AND FRAMES

1. Size per door schedule.
2. Manufacturers: Ceco Door, Republic Doors, Steelcraft, or approved substitutions.
3. Interior Doors: Based on SDI Standards: ANSI/SDI A250.8 (SDI-100)
 - A. Flush Construction; Level 1 - Standard-duty
 - B. Door Face Metal Thickness: 16 gage, 0.053 inch, minimum
 - C. Zinc Coating: Not required; ASTM A653/A653M
 - D. Core Material: Manufacturers standard core material/construction and in compliance with requirements
 - E. Door Thickness: 1-3/4 inch, nominal
 - F. Door Finish: Factory primed and field finished.
4. Interior Door Frames: Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements; Slip-on type at gypsum board walls, and knock-down type at masonry walls
 - A. Frame Metal Thickness: 18 gage, 0.042 inch, minimum
 - B. Frame Finish: Factory primed and field finished
 - C. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.
5. Borrowed Lites Glazing Frames: Construction and face dimensions to match door frames, and as indicated on drawings.
6. Accessories: Glazing: As specified in Section 08 8000, factory installed
 - A. Removable stops in steel window frames: Formed sheet steel, shape as indicated on drawings, mitered or butted corners; prepared for countersink style tamper proof screws;
 - B. Removable stops in non-fire rated steel doors: Similar to Air Louvers, Inc. Model VLF1G square vision light steel stops. 18 gauge cold rolled steel frame with mitered and welded corners, prepared countersunk style tamper proof screws.
 - C. Sealant: Pemko Fire Glaze sealant systems
 - D. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

END OF SECTION

SECTION 08 4313

ALUMINUM FRAMED STOREFRONTS

1. Exterior Storefront Basis of Design: Kawneer
 - A. Product: Trifab VG 451UT.
 - B. Other Acceptable Manufacturer: Oldcastle Building Envelope.

2. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
 - A. Glazing Rabbet: For 1 inch insulating glazing
 - B. Glazing Position: Centered (front to back).
 - C. Mullion Dimensions: 2 inches wide by 4-1/2 inches deep, typical.
 - D. Finish: Superior performing organic coatings. Factory finish all surfaces that will be exposed in completed assemblies.
 - E. Finish Color: As selected by Architect from manufacturer's standard line.

3. Doors: Glazed aluminum.
 - A. Similar to Kawneer 500 Tuffline Entrance.
 - B. Thickness: 2 inches.
 - C. Top Rail: 5 inches wide.
 - D. Vertical stiles: 5 inches wide
 - E. Bottom Rail: 10 1/4 inches wide.
 - F. Glazing stops: Aluminum
 - G. Vision Lites: Aluminum framed, for 1" infill glazing.
 - H. Core: Polyurethane, 5 pound density, non-HCFC meeting Greenguard standards.
 - I. Finish: Same as storefront.

END OF SECTION

SECTION 08 5801

INTERIOR ALUMINUM SERVICE WINDOW

1. Sliding Transaction Window: Basis of Design: CRL Delux Sliding Service Window Model DW 4200A.
 - A. Frame: Aluminum frame modules shall be constructed of 063-T5 extruded aluminum Window rolls on top-hung ball bearing rollers. Catch locks included with all interior windows. Overall frame sizes are to be in accordance with contract drawings.
 - B. Finish: Clear satin anodized.
 - C. Glazing: 3/8 inch thick, tempered, laminated clear glass.
 - D. Size: As indicated on drawings.

2. Ticket Window with Keyed Lock: Basis of Design "CLR Ticket Window with Speak-thru and Swing-Away Cover Plate Model SCW 103C with 4" Narrow Inset Frame for 1/2 inch glass (Custom Size).
 - A. Frame: 1.390 x .625 inches extruded aluminum.
 - B. Finish: Clear anodized.
 - C. Glazing: 1/2 inch thick, clear tempered, laminated glass.
 - D. Shelf: Install with shelf.
 - E. Voice Transmission: Communication permitted by 834A no draft speak-thru centered in glazing.
 - F. Size: As indicated on drawings.

END OF SECTION

SECTION 08 7100

DOOR HARDWARE

1. Commercial grade, satin chrome lever hardware.
2. See door schedule for locations of ADA door operators and access control card readers.
3. See door schedule for information on acoustic door hardware, seals, door bottoms, etc.
4. Comply with OSSC, all rooms to have free egress.
5. Subcontractor to meet with owner and architect to coordinate door hardware requirements, develop hardware schedule and submit hardware schedule to Architect and Owner for review.
6. Door access readers required at main and rear entrances of City Manager's office. Provide allowance for coordination with low voltage and hardware.

END OF SECTION

SECTION 08 7110

DOOR HARDWARE SCHEDULE

HW SET: 01
EACH TO HAVE:

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1EA	PASSAGE SET	ND10S RHO	626	SCH
1EA	WALL STOP	WS406/407CVX	630	IVE
1EA	GASKETING	188S-BK	S-BK	ZER
1EA	DOOR BOTTOM	364AA6	AA	ZER

HW SET: 02

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1EA	PASSAGE SET	ND10S RHO	626	SCH
1EA	WALL STOP	WS406/407CVX	630	IVE
1EA	GASKETING	188S-BK	S-BK	ZER
1EA	DOOR BOTTOM	364AA6	AA	ZER
1EA	SURFACE CLOSER	4040XP	689	LCN

END OF SECTION

SECTION 08 8000

GLAZING

1. Type IG-1 - Insulating Glass Units: Vision glass, double glazed.
 - A. Applications: Exterior glazing unless otherwise indicated.
 - B. Space between lites filled with air.
 - C. Outboard Lite: Annealed float glass, 1/4 inch thick, minimum.
 - a. Tint: Clear.
 - b. Coating: Low-E (passive type), on #2 surface.
PPG Solarban 70XL
 - D. Inboard Lite: Annealed float glass, 1/4 inch thick, minimum.
 - a. Tint: Clear.
 - b. Total Thickness: 1 inch.

END OF SECTION

SECTION 09 2100

GYPSUM BOARD ASSEMBLIES

1. Gypsum Board:
 - A. Walls: 5/8 inch thick, Type-X; use moisture resistant type within 5' of any plumbing fixture.
2. Acoustical Insulation: glass fiber type, Greenguard certified for low emissions, batt thickness to fill entire depth of stud cavity.
3. Acoustical sealant: acrylic emulsion latex; ASTM C834, type OP, grade NF single component, paintable.
 - A. Provide continuous bead at perimeter of each layer of gypsum board. Seal around all penetrations of conduit, pipe, ducts, and rough-in boxes.
4. Finish texture: Level 4 finish, UNO
5. Patch all existing holes in existing walls and abrasions in wall finish from previous demolition work.

END OF SECTION

SECTION 09 2200

NON-STRUCTURAL METAL FRAMING

1. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, install per ASTM C754.
2. Studs: C shaped with flat or formed webs with knurled faces. See Detail 2/A533 for typical stud sizes.
 - A. Scafco Supreme D20 Studs, where indicated.
3. Runners: U shaped, sized to match studs.
4. Resilient channels to be ClarkDietrich RC Deluxe. Any substitutions must include acoustical test reports to verify performance.
5. Furring: Z sub girts, minimum depth 2 1/2 inches at exterior.
6. Minimum Metal Thickness: 20 gage, non structural
7. Bottom Tracks: 20 gage (30 mil).
8. Deflection Tracks: 43 mil slotted track permitting 2 inch minimum deflection slots (1 1/2 inches down and 1/2 inches up).
9. Furring and Bracing Members: Of same material as studs; thickness to suit purpose; complying with applicable requirements of ASTM C754.
10. Fasteners: ASTM C1002 self-piercing tapping screws.
11. Sheet Metal Backing: 0.036 inch thick, galvanized.
12. Acoustic Insulation: As specified in Section 09 2100.
13. Adhesives and sealants: Provide only products having volatile organic compound (VOC) content not greater than required by South Coast air Quality Management District Rule No 1168.
14. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic.
15. Pony Wall Support Posts by SCAFCO or similar.

16. Stud splicing is not permissible.
17. Fabricate corners using a minimum of three studs.
18. Double stud at wall openings, door and window jambs, not more than 2 inches from each side of openings.
19. Coordinate erection of studs with requirements of door frames; install supports and attachments.
20. Coordinate installation of bucks, anchors, and blocking with electrical, mechanical, and other work to be placed within or behind stud framing.
21. Blocking: Use steel channels secured to studs. Provide blocking for support of plumbing fixtures, toilet partitions, wall cabinets, toilet accessories, hardware, opening frames, and other accessories shown on drawings.
22. Maximum Variation From True Position: 1/8 inch in 10 feet.
23. Maximum Variation From Plumb: 1/8 inch in 10 feet.

END OF SECTION

SECTION 09 5100

ACOUSTIC CEILINGS

1. Acoustic Lay-In Ceiling Tile System
 - A. Products:
 - a. ACT-1: Match existing ceiling tile. See Room Finish and Materials Legend.
 - b. ACT-2: Locate in Restroom 508. Mildew Resistant Ceiling Tile similar or equal to Aquarock by Certainteed. 1180-CRF-1SV.
2. Suspension Systems - General: ASTM C635; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, hold down clips, and expansion joints as required.
3. Steel Suspension System: Formed steel, commercial quality cold rolled heavy duty main beams and intermediate duty cross runners.
4. Seismic Ceiling Joint Trip or Device: Manufacturer's standard providing 3/4 inch movement, matching grid.
5. At all rooms with new ceiling grid, provide seismic bracing as required by OSSC for Occupancy Category II, Seismic Design Category D. NWCD Technical Bulletin 401 may be used as a reference.

END OF SECTION

SECTION 09 5426

WOOD CEILINGS

1. Wood Ceiling Panels WD-1: Basis of Design: 9Wood, Inc. Wood Tile Series 5000.
 - A. Wood Panels: 5100 Parallel Perf Tile.
 - a. Species: Selected by Architect from standard species.
 - b. Panel size: 24 by 48 inches.
 - c. Perforation Spacing: 32 mm
 - d. Perforation Diameter: 8 mm
 - e. Fire Rating: Class I (A) Fire Rating
 - f. Assembly Style: Class I (A) Fire Rated panel backer (black).
 - g. Finish: Selected by Architect.
 - B. Substitutions: Owner approval only.
 - C. Install in existing grid ceiling.

END OF SECTION

SECTION 09 6500

RESILIENT FLOORING

1. Commercial Luxury Vinyl Plank - Type LVT-1.
 - A. Manufacturer: Patcraft.
 - B. Product: Timber Grove II.
 - C. Style: V3.
 - D. Thickness: 20 mil.
 - E. Color: As indicated on drawings.

2. Commercial Luxury Vinyl Plank - Type LVT-2.
 - A. Manufacturer: Patcraft.
 - B. Product: Timber Grove II.
 - C. Style: V2.
 - D. Thickness: 20 mil.
 - E. Color: As indicated on drawings.

3. Resilient Base - Type B-1 and B-2: ASTM F1861, Type TP, rubber, thermoplastic; top set Style B, Cove.
 - A. Critical Radiant Flux (CFR): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648 or NFPA 253.
 - B. Height: 4 inch typical as scheduled.
 - C. Thickness: 0.125 inch.
 - D. Finish: Satin.
 - E. Color: As indicated on drawings.
 - F. Basis of Design B-1: Johnsonite Traditional Wall Base.
 - G. Basis of Design B-2: Roppe 700 Series.
 - H. Other Acceptable Manufacturers: Flexco Floors.

4. Resilient Floor - Type RS-1: ASTM F1303 Type I, Grade 1, Class B.
 - A. Manufacturer: Mannington Commercial
 - B. Product: Paradigm II Collection
 - C. Style: Flow
 - D. Thickness: 0.080 inches
 - E. Color: As indicated on drawings.

5. Provide 5% of additional flooring material in each flooring type to Owner.

END OF SECTION

SECTION 09 6813

TILE CARPETING

1. Carpet Tile - Type CPT-1 and CPT-2
 - A. Manufacturer: ShawContract
 - B. Style: As indicated on Finish and Material Legend.
 - C. Size: As indicated on Finish and Material Legend.
 - D. Color: As indicated on Finish and Material Legend.
 - E. Average density: 9000 oz/yd³
 - F. Gauge: 1/10 inches
 - G. Total thickness: 0.068 inches
 - H. Primary Backing: Synthetic
 - I. Secondary Backing: ecoworx tile
 - J. Installation: Ashlar

2. Carpet Tile - Type CPT-3, CPT-4 and CPT-5
 - A. Manufacturer: Mannington Commercial
 - B. Style: As indicated on Finish and Material Legend.
 - C. Size: As indicated on Finish and Material Legend.
 - D. Color: As indicated on Finish and Material Legend.
 - E. Average density: 6,315 oz/yd³
 - F. Gauge: 5/64 inches
 - G. Total thickness: 0.114 inches
 - H. Primary Backing: Infinity 2 Modular
 - I. Installation: 3-Step Vertical Ashlar

3. Carpet Tile - Type CPT-6, CPT-7 and CPT-8
 - A. Manufacturer: Milliken
 - B. Style: As indicated on Finish and Material Legend.
 - C. Size: As indicated on Finish and Material Legend.
 - D. Color: As indicated on Finish and Material Legend.
 - E. Nominal Total Weight: 86.7 oz/yd²
 - F. Gauge: 1/10 inches
 - G. Total thickness: 0.31 inches
 - H. Primary Backing: PVC-Free WellBAC Comfort Cushion
 - I. Installation: Monolithic

4. Verify that substrates meet moisture and pH recommendations per manufacturer requirements through testing. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
5. Install in accordance with manufacturer's instructions. Verify installation pattern with Architect.
6. Install resilient edge strips at terminations to other materials.
7. Provide 5% additional carpet tiles to Owner in each of the types of carpet.

END OF SECTION

SECTION 09 8405

ACOUSTICAL WALL PANEL

1. Acoustical Panels: Basis of Design: F_{sorb}
 - A. Thickness: 1/2"
 - B. Acoustical Performance: NRC of 0.50
 - C. Panel Size: 48 x 96 inches
 - D. Color: As indicated on Finish and Material Legend.
 - E. Cut Shapes: As indicated on drawings. CAD files can be provided by Architect.
 - F. Locations: As indicated on drawings.

END OF SECTION

SECTION 09 9000

PAINTING & COATING

1. Paint:
 - A. Benjamin Moore, Sherwin-Williams, Rodda, or approved alternate.
 - B. Provide product data and 3 draw-downs for each color and sheen for Architect's review.
 - C. Provide 1 gallon of each color and sheen for Owner's maintenance.
2. This provision applies to paints and coatings used anywhere on the interior of the building inside the weather barrier, including all primers and sealers.
3. Provide coatings that comply with the most stringent requirements specified in the following:
 - A. Architectural Paints and Coatings: Do not exceed VOC content limits established in GreenSeal GS-11.
 - B. Anti-Corrosive and Anti-Rust Paints: Do not exceed VOC content limits established in GreenSeal GS-03.
4. Gypsum board in dry areas: 1 coat acrylic primer; 2 coats acrylic latex; eggshell.
5. Colors: Refer to Finish and Materials Legend on drawings.
6. Verify all colors with Owner and Architect through Interior Color Study.
7. Interior Color Study:
 - A. Assist the Architect in the final interior color selection by painting the approved paint material of each color on the Finish and Material Legend in 4-foot-wide x 4-foot-tall test patches for approval by Owner. Paint on selected interior finished wall surfaces on walls to receive accent colors.
 - B. Provide up to two additional color test patches of each color showing adjusted color values.
 - C. After final color selection, cover over the test samples with primer to eliminate color bleed-through and re-coat with final approved colors.
8. Surface Preparation: Fill all existing holes and damage to wall and ceiling surfaces.

9. Application: Apply products in accordance with manufacturer directions. Remove unfinished mechanical and electrical components and reinstall after painting.

END OF SECTION

SECTION 10 2800

TOILET, BATH, AND LAUNDRY ACCESSORIES

1. Commercial Toilet Accessories:
 - A. Toilet Paper Dispenser: Double roll, surface mounted bracket type, stainless steel.
 - a. Supplied by Owner's Paper Vendor.
 - B. Mirrors: Stainless steel framed, 1/4 inch thick annealed float glass; ASTM C1036.
 - a. Size: As indicated on drawings.
 - b. Frame, where indicated: 0.05 inch angle shapes, with mitered and welded and ground corners, and tamperproof hanging system; No. 4 finish.
 - c. Product: B-290 manufactured by Bobrick.
 - d. Mirror M-1: Type: Framed.
 - C. Grab Bars: Stainless steel, smooth surface.
 - a. Standard Duty Grab Bars:

Push/Pull Point Load: 250 pound-force minimum.
Dimensions: 1-1/4 inch outside diameter, minimum 0.05 inch wall thickness, exposed flange mounting. 1-1/2 inch clearance between wall and inside of grab bar.
Length and Configuration: As indicated on drawings.
Products:
GB-1: 36 inches, similar to Bobrick 5806.
GB-2: 42 inches, similar to Bobrick 5806.
GB-3: 18 inches, similar to Bobrick 5806.
2. Commercial Shower and Bath Accessories
 - A. Shower Curtain Rod: Stainless steel tube, 1 inch outside diameter, 0.04 inch wall thickness, satin-finished, with 3 inch outside diameter unless otherwise indicated, minimum 0.04 inch thick satin-finished stainless steel flanges, for installation with exposed fasteners.
 - a. Product: B-6107 manufactured by Bobrick.
 - b. Length: 36 inches.
 - B. Shower Curtain:
 - a. Material: Opaque vinyl, 0.008 inch thick, matte finish, with antibacterial treatment, flameproof and stain-resistant.
 - b. Size: 72 by 72 inches, hemmed edges.
 - c. Grommets: Stainless steel; pierced through top hem on 6 inch centers.

- d. Color: White
 - e. Shower Curtain Hooks: Chrome-plated or stainless steel spring wire designed for snap closure.
 - f. Product: 204-2 curtain with 204-1 hooks manufactured by Bobrick.
- C. Folding Shower Seat: Wall-mounted surface; welded tubular seat frame, structural support members, swing-down legs, hinges, and mechanical fasteners of Type 304 stainless steel, L-shaped, right hand seat.
- a. Seat: Phenolic or polymeric composite one-piece seat or seat slats, of color as selected.
 - b. Size: ADA standards complaint.

END OF SECTION

SECTION 12 3600

COUNTERTOPS

1. Solid Surfacing Countertops - Type SS-1, SS-2, and SS-3: Solid surface sheet or plastic resin casting over continuous substrate.
 - A. Flat Sheet Thickness: 1/2 inch, minimum.
 - B. Complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
 - a. Manufacturers:
 - Dupont: www.corian.com
 - Avonite Surfaces: www.avonitesurfaces.com
 - Wilsonart: www.wilsonart.com
 - b. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
 - c. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.
 - d. Color and Pattern: As indicated on drawings.
 - C. Other Components Thickness: 1/2 inch, minimum.

END OF SECTION

SECTION 12 5210

UPHOLSTERED SEATING

1. Fabric Type FA-1:
 - A. Manufacturer: Momentum Textiles
 - B. Product: Silica Blend
 - C. Color: As indicated on Finish and Material Legend.
 - D. Content: 70% Polyurethane/ PVC Free, 30% Silicone
 - E. Width: 54 inches
 - F. Backing: Polyester
 - G. Performance Data:
 - Flame Resistance: CA Bulletin 117 2013, UFAC Class 1, NFPA 260 Class 1, Passes IMO Part 8 with proper components
 - Durability: 500,000 Double Rubs

2. Fabric Type FA-2:
 - A. Manufacturer: Momentum Textiles
 - B. Product: Zipped
 - C. Color: As indicated on Finish and Material Legend.
 - D. Content: 100% Polyurethane/ PVC Free
 - E. Width: 54 inches
 - F. Backing: Polyester
 - G. Performance Data:
 - Flame Resistance: CA Bulletin 117 2013, UFAC Class 1, NFPA 260 Class 1, Passes IMO Part 8 with proper components
 - Durability: 100,000 Double Rubs

3. Fabric Type FA-3:
 - A. Manufacturer: Carnegie
 - B. Product: Maze Print
 - C. Color: As indicated on Finish and Material Legend.
 - D. Content: Face: 71% Polyurethane (Polycarbonate), 29% Silicone, Back: 100% Polyester
 - E. Width: 54 inches
 - F. Backing: Unbacked
 - G. Repeat: 27.5 inches Length x 27.5 inches Width
 - H. Performance Data:
 - Flammability: California Technical Bulletin 117-2013. IMO 2010 FTP Part 8 for Upholstery as Stocked.
 - Durability: 250,000 Double Rubs

END OF SECTION

SECTION 00 0110
TABLE OF CONTENTS

PROCUREMENT AND CONTRACTING REQUIREMENTS

1.00 DIVISION 21 -- FIRE SUPPRESSION

- 21 0500 - General Fire Protection Provisions
- 21 1313 - Wet-Pipe Sprinkler Systems

1.01 DIVISION 22 -- PLUMBING

- 22 0500 - General Plumbing Provisions
- 22 0517 - Sleeves, Sleeve Seals, and Escutcheons for Plumbing Piping
- 22 0523 - Valves for Plumbing Piping
- 22 0529 - Hangers and Supports for Plumbing Piping and Equipment
- 22 0553 - Identification for Plumbing Piping and Equipment
- 22 0719 - Plumbing Piping Insulation
- 22 1116 - Domestic Water Piping
- 22 1119 - Domestic Water Piping Specialties
- 22 1316 - Sanitary Waste and Vent, Piping
- 22 1319 - Sanitary Waste Piping Specialties
- 22 3300 - Electric, Domestic- Water Heaters
- 22 4200 - Commercial Plumbing Fixtures

1.02 DIVISION 23 -- HVAC

- 23 0500 - General HVAC Provisions
- 23 0593 - Testing, Adjusting, and Balancing for HVAC
- 23 0713 - Duct Insulation
- 23 0922 - General Automation Controls for HVAC
- 23 3113 - Metal Ductwork
- 23 3300 - Air Duct Accessories
- 23 3713 - Air Outlets and Inlets
- 23 8146 - Air Source Heat Pumps

1.03 DIVISION 26 -- ELECTRICAL

- 26 0155 - Electrical Systems Firestopping
- 26 0500 - General Electrical Provisions
- 26 0501 - Electrical Demolition
- 26 0519 - Low-Voltage Electrical Power Conductors and Cables
- 26 0533 - Raceways and Boxes for Electrical Systems
- 26 0553 - Identification for Electrical Systems
- 26 0924 - Digital Lighting Control Equipment
- 26 2416 - Panelboards
- 26 2726 - Wiring Devices
- 26 5100 - Lighting Fixtures

1.04 DIVISION 27 – COMMUNICATIONS

27 1500 - Communications Horizontal Cabling

END OF SECTION

SECTION 21 0500
GENERAL FIRE PROTECTION PROVISIONS

PART 1 - GENERAL

1.01 CONTRACT DOCUMENTS

- A. General fire protection provisions apply to all work performed in Division 21.
- B. The Contract Documents are complementary. What is required by anyone, as affects this Division, shall be as binding as if repeated herein.
- C. Separation of this Division from other Contract Documents shall not be construed as segregation of the Work.
- D. Location of equipment on Drawings is approximate. Plan exact location with respect to site measurements and work of other trades prior to starting work. If measurements differ slightly, modify work. If measurements differ substantially, notify Architect/Engineer and Owner's Authorized Representative prior to fabrication.
- E. Make minor changes in equipment connections and equipment locations as directed or required before rough-in without extra cost.
- F. For products specified by listing one or more manufacturers, followed by "Similar to" and one manufacturer's model number, the following requirements apply:
 - 1. Approval of each listed manufacturer is contingent upon that manufacturer having a product which meets the specification, fits in the available space, and is comparable to the listed model.
 - 2. Electrical requirements, duct requirements, pipe connections, and space requirements indicated on drawings are based on the listed model and may not be suitable for all manufacturers listed. Provide revisions required to accommodate the model actually furnished.
- G. For product specified by listing one or more manufacturers, followed by a model number for each manufacturer, the following requirements apply:
 - 1. Provide one of the listed model numbers or an approved substitution.
 - 2. Electrical requirements, duct connections, pipe connections, and space requirements indicated on the Drawings are based on one of the listed models, and may not be suitable for all models listed. Provide revisions required to accommodate the model actually furnished.

1.02 DEFINITIONS

- A. Authority Having Jurisdiction (AHJ): The governmental agency or sub-agency which regulates the construction process.
- B. Owner's Authorized Representative (OAR): Owner's representative with authority to act on Owner's behalf.
- C. Architect/Engineer: The design professional leading the design team and can be either an architect or engineer.
- D. The words furnish, install and provide are defined as follows:
 - 1. Furnish: To supply and deliver to the project ready for installation and in operable condition.
 - 2. Install: To place in final position, complete, anchored, connected in operable condition.
 - 3. Provide: To furnish and install complete. Includes the supply of specified services.
 - 4. When neither furnish, install or provide is stated, provided is implied.

1.03 COORDINATION

- A. Check drawings of other trades to avert possible installation conflicts. Should major changes from original drawings be necessary to resolve such conflicts, notify Architect/Engineer and secure written approval and agreement on necessary adjustments before start of work.

- B. Architectural drawings govern all other drawings. Consult in detail the door swings, counter heights and similar items affecting work before rough-in.
- C. Coordinate identification systems with other trades. All mechanical systems shall use identical piping, valve, and equipment identification and regulatory signage.

1.04 SUBMITTALS AND SHOP DRAWINGS

- A. See Division 01
- B. Action Submittal Content
 - 1. Action submittal information not expressly required by the specifications will not be reviewed.
 - 2. Action submittal information shall be provided in sufficient detail to establish conformance with specified requirements. Where submitted literature includes multiple models, features, or options, the specific models, features, or options proposed shall be clearly indicated. Where a brief inspection shows that product data is not complete, the submittal will be rejected without review.
 - 3. Action submittal data shall be clear, concise, legible, and relevant. Where data is not properly organized and contains significant information that is not relevant, the submittal will be rejected without review.
 - 4. Action submittal requirements will be listed in individual specification sections. The following definitions apply.
 - a. Materials List: Provide tabular list of materials including specification reference, specification product name, manufacturer, model/part number, and size and/or quantity where appropriate. Do not include supplemental data, except where specifically requested.
 - b. Catalog data: Manufacturer's standard product cut sheet.
 - c. Product Data: Detailed data including dimensions, weight, materials of construction, connections, and all other information needed to confirm that the product conforms to all requirements listed in the individual specification section.
 - d. Performance Data: Capacity, input, output, flow, etc. as required to confirm that the product meets the performance requirements scheduled in the Specifications or on the Drawings.
 - e. Wiring Diagrams: Power and control wiring diagrams.
 - f. Shop Drawings: Construction drawings of items manufactured specifically for this project including dimensions, construction details, weights, and additional information to identify the physical features of the system or piece of equipment.
 - g. Installation Instructions.
 - h. Special Requirements Listed: Additional requirements indicated in individual specification sections.
- C. Delegated Design
 - 1. Delegated work will include:
 - a. Section 21 1313 – Wet-Pipe Sprinkler Systems.
 - 2. 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.
 - a. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Engineer.
 - 3. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF electronic file, 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.
 - a. 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.

1.05 QUALITY ASSURANCE

- A. All materials and equipment provided hereunder shall be installed and started in complete conformance with the manufacturer's recommendations.
- B. Asbestos products or equipment or materials containing asbestos shall not be used.

1.06 DESIGN REQUIREMENTS

- A. Materials and equipment provided hereunder shall be rated for the service conditions of the system to which they are connected including but not limited to temperature, pressure, and humidity.

1.07 CODES AND STANDARDS

- A. Applicable codes and standards shall determine minimum requirements for materials, methods, and labor practices not otherwise stated herein.
- B. Work shall comply with the Americans with Disabilities Act (ADA).

1.08 TEMPORARY SERVICES

- A. Provide in accordance with Division 01 as required for completion of work.
- B. Maintain existing systems operational. Owner will be responsible to operate and maintain existing equipment during the course of the project. However, any damage to existing equipment resulting directly from work under this Contract shall be repaired by the Contractor at no expense to Owner.

1.09 FIELD CONDITIONS

- A. Interruption of Existing Service: Do not interrupt water or sprinkler service to facilities occupied by Owner or others unless permitted under the following conditions:
 - 1. Notify Owner's Authorized Representative no fewer than five business days in advance of proposed interruption of services.
- B. Do not proceed with interruption of services without written permission of Owner's Authorized Representative.

1.10 OPERATIONS AND MAINTENANCE MANUALS

- A. Furnish operation and maintenance data for project, as described herein.
- B. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF files.
 - 1. Include a directory of all subcontractors and maintenance contractors with names, addresses, and telephone numbers, indicating the area of responsibility for each.
 - 2. 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.
 - 3. Provide a composite summary table indicating each item of equipment listed in the operations and maintenance manual and its required maintenance and time period. This summary table shall be the first section in the O&M manual.
 - 4. Manual Content: Manuals shall contain complete information for each item of mechanical, electrical or other operating equipment. Include as applicable:
 - a. Manufacturer's instructions for installation, startup, operation, inspection, and maintenance.
 - b. Lubrication schedules.
 - c. Performance capacity.
 - 1) Final approved product submittals for each product included in project.
 - a) Mark the model actually provided where the literature covers more than one model. Include all submittal data corrected to "as-built" conditions within the manual.
 - b) Parts list.
 - d. Maintenance schedules.

- e. Maintenance instructions shall indicate routine-type work with step-by-step instructions that should be performed to ensure long life and proper operations. Recommended frequency of performance shall also be included.
- 5. File Names and Bookmarks: Bookmark 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.

1.11 RECORD DRAWINGS

- A. Provide record "as-built" drawings in accordance with Division 1 requirements. Show all deviations from contract drawings and location of underground lines by accurate dimensions from building lines. Show depth of all stub outs and underground lines. Dimension all concealed piping from column grids or building lines. Transfer all information to one hard copy of drawings at completion of project. Alternately, provide electronically using .pdf markup of contract drawings.

1.12 DEMONSTRATION

- A. General: After installation is complete, demonstrate to Authority Having Jurisdiction and Owner's Authorized Representative's satisfaction as being complete and operational and entirely in conformance with Contract Documents.
- B. Arrange for demonstration with Owner and Authority Having Jurisdiction at least one week in advance of demonstration.

1.13 TRAINING

- A. Instruct Owner in proper operation and maintenance of equipment and systems. Instruction shall generally include topics listed in manufacturer's operations and maintenance manual. Operator instructions shall cover all aspects of manual, automatic, and safety controls. Contractor shall also instruct the Owner in the general configuration of systems and location of equipment and components.
- B. Furnish competent qualified technicians knowledgeable in fire protection systems and equipment provided for this project for a minimum of 3 hours on-site to instruct Owner in operation and maintenance of systems and equipment. This figure does not include additional training noted under individual specification sections. Contractor shall keep a log of this instruction including date, times, subjects, and those present and shall present such log when requested by Engineer. Contractor shall coordinate training with Owner's Project Manager and provide a schedule for training minimum two-weeks prior to Substantial Completion. All training shall be complete 30-days after Substantial Completion.
- C. Contractor shall furnish training by equipment manufacturers in addition to training described in this section where specifically listed in other sections. Contractor shall schedule training with Owner's Project Manager minimum 48-hours prior to training session. Equipment shall be fully operational prior to scheduling training session. Manufacturer's field start-up, adjustment, and service will not fulfill manufacturer's training requirement.

PART 2 - PRODUCTS

2.01 PRODUCTS AND MATERIALS

- A. All materials employed in permanent construction shall be new, full weight, in first class condition, and suitable for space provided. All similar materials shall be of one manufacturer.
- B. Equipment used as the basis of design is scheduled on drawings or designated in product specifications. If Contractor chooses to use equipment that is not the basis of design, Contractor is responsible for all re-design and construction costs associated with variations in arrangement, dimension, or capacity. Such work may include, but is not limited to, changes to facility structure or dimensions and revisions to associated mechanical and electrical systems needed to provide equal system performance and maintainability.

2.02 FIRESTOPPING

- A. Comply with Division 07.

2.03 ACCESS DOORS AND FRAMES FOR WALLS AND CEILINGS

- A. Acceptable Manufacturers: J.L. Industries, Karp Associates, Inc., Meadowcraft, Inc., Mifab, Milcor Div.; Inryco, Inc., or Nystrom, Inc.
- B. Access Door Assembly: Continuous welded steel construction unless otherwise indicated. Grind exposed welds smooth and flush with adjacent surfaces. Provide anchors and attachments necessary for installation indicated.
 - 1. Frames: 16 gage steel; provide flange type necessary for the installation required.
 - 2. Stainless Steel Frames and Flush Panel Doors: 14 gage stainless steel, No. 4. satin finish: concealed spring hinges or concealed piano hinge set to open 175 degrees.
 - 3. Flush Doors: 14-gage sheet steel, with concealed spring hinges or concealed continuous piano hinge set to open 175 degrees.
 - 4. Lock: Screwdriver-operated cam locks, number required to hold door flush when closed.
 - 5. Ceiling Doors: Recessed door panel depth necessary to finish ceiling insert and install flush to adjacent finish ceiling. Reinforced 18 gage sheet steel face. Provide access sleeves for locking devices. Size: As necessary for efficient access, but not less than 24 by 24 inches. Obtain Architect's acceptance of manufacturer's standard size units which vary from sizes indicated.
- C. Fire Rated Units: Comply with NFPA 80, provide UL listed and labeled units having performance level required with insulated flush panel door, continuous piano hinge and self-closing mechanism for rated assemblies in sizes and configuration required.
 - 1. Vertical Doors: NFPA 252 or UL 10B.
 - 2. Horizontal Doors: ASTM E 119 or UL 263.
- D. Shop Applied Coating: Corrosion resistant prime paint compatible with field applied finish specified in Division 09.
- E. Fire-Rated Access Doors and Frames: Units complying with NFPA 80 tested according to the following test method:
 - 1. NFPA 252 or UL 10B for fire-rated access door assemblies installed vertically.
 - 2. NFPA 288 for fire-rated access door assemblies installed horizontally.

2.04 IDENTIFICATION

- A. Provide equipment identification and signage in accordance with NFPA 13.

PART 3 - EXECUTION

3.01 ACCESS TO EQUIPMENT AND ACCESSORIES

- A. Install equipment with sufficient access for service. Where not conveniently accessible by other means, provide adequately sized access doors for valves, dampers, motors, belts, and all other mechanical equipment requiring access for removal or maintenance. Type, size and exact location of access doors shall be coordinated with Architect prior to work.
- B. Provide clearances for maintenance access as indicated on Drawings or as recommended by manufacturer. If access requirements shown on Drawings conflict with manufacturer's recommendations, provide larger clearance of the two.
- C. If equipment location shown on Drawings does not allow required access, notify Architect/Engineer prior to start of work.
- D. Apply and install all items in accordance with manufacturer's written instructions. Refer conflicts between the manufacturer's instructions and the contract drawings and specifications to Architect/Engineer for resolution prior to starting work.
- E. Provide access doors as required for access to equipment. Doors required for access are not necessarily shown on Drawings. Consult with Architect for direction on placement of required doors not shown on Drawings.

1. Comply with manufacturer's instructions for installation of access doors. Provide all necessary support and supplemental framing for assembly where the access doors are required. Set accurately in position, plumb, level, and flush to adjacent finish surfaces; and secure to support.

3.02 ARRANGEMENT AND INSTALLATION OF EQUIPMENT AND PIPING

- A. Coordinate location of piping, sleeves, inserts, hangers and equipment. Locate piping, sleeves, inserts, hangers and equipment clear of windows, doors, openings, lights, electrical outlets, and other services and utilities.
- B. Equipment and Piping Support: Coordinate structural systems necessary for pipe and equipment support with pipe and equipment locations to permit proper installation.
- C. Location of pipe sleeves, trenches and chases shall be accurately coordinated with equipment and piping locations.
- D. Minor Piping: Small diameter pipe runs from drips and drains and similar minor services are generally not shown but must be provided. Contractor is responsible to provide all such minor piping where needed.
- E. Work in Existing Building: Cut required openings through existing masonry and reinforced concrete using diamond core drills. Use of pneumatic hammer type drills, impact type electric drills, and hand or manual hammer type drills, will be permitted only with approval of the Owner's Authorized Representative. Locate openings that will least affect structural slabs, columns, ribs or beams. Refer to the Architect/Engineer for determination of proper design for openings through structural sections and obtain layout approval prior to cutting or drilling into structure. After Architect/Engineer's approval, carefully cut opening through construction no larger than absolutely necessary for the required installation.
- F. Switchgear Drip Protection: Do not install piping above electrical switchgear.
- G. Inaccessible Equipment
 1. Where the Owner's Authorized Representative determines that the Contractor has installed equipment not conveniently accessible for operation and maintenance, equipment shall be removed and reinstalled or remedial action performed as directed at no additional cost to the Owner.
 2. The term "conveniently accessible" is defined as capable of being reached without the use of ladders, or without climbing or crawling under or over obstacles such as motors, fans, pumps, belt guards, transformers, high voltage lines, piping, and ductwork.

3.03 MECHANICAL SYSTEMS FIRESTOPPING

- A. Do not cover firestop installations until the examined by the Authority Having Jurisdiction, if required.
- B. Install firestopping in accordance with manufacturer's recommendations and conditions of product UL listing.

3.04 CLEANING SYSTEMS

- A. General: After all equipment and piping is installed, system shall be thoroughly cleaned. Remove all stickers and tags and clean all piping systems prior to painting.

3.05 START UP

- A. The Fire Protection Contractor shall be responsible for proper operation of all systems and shall coordinate startup procedures, calibration and system checkout. System operational problems shall be diagnosed and corrected as required for system operation prior to Substantial Completion inspection.

END OF SECTION

SECTION 21 1313
WET-PIPE SPRINKLER SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes pipes, fittings, specialty valves, monitoring and control devices, and other accessories for a complete wet-pipe sprinkler system providing full coverage for areas shown on drawings including elevator shafts and equipment rooms, mechanical rooms, and interstitial spaces.

1.02 DEFINITIONS

- A. Standard-Pressure Sprinkler Piping: Wet-pipe sprinkler system piping designed to operate at working pressure of 175-psig maximum.

1.03 ACTION SUBMITTALS

- A. General
 - 1. Pipe and fittings: Materials List
 - 2. Specialty Valves, Sprinkler Piping Specialties, Sprinklers, Alarm Devices, Control Panels: Provide catalog data. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
- B. Delegated Design Submittals:
 - 1. Delegated design shall be performed and documented in accordance with NFPA 13 by a NICET level III fire protection certified technician certified persons qualified in accordance with Authority Having Jurisdiction.
 - 2. Provide detailed scaled construction drawings showing fire protection piping, heads, valves, fire pump, jockey pump, pump controllers, and accessories including pipe sizes, locations, elevations, slope of horizontal runs, wall and floor penetrations and connections. Include attachment details and identify system components which are located in areas of the building which are subject to freezing.
 - a. Submit preliminary drawings showing exposed piping and sprinkler layout to Architect/Engineer for approval.
 - b. Upon approval by Architect/Engineer, submit drawings to Authority Having Jurisdiction.
 - c. Upon approval by Authority Having Jurisdiction, submit final drawings with approval stamp to Architect/Engineer.
 - 3. Provide hydraulic calculations per NFPA 13.

1.04 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.
- B. Approved Sprinkler Piping Drawings: Working plans, prepared according to NFPA 13, that have been approved by authorities having jurisdiction, including hydraulic calculations.

1.05 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For wet-pipe sprinkler systems and specialties to include in emergency, operation, and maintenance manuals.

1.06 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Sprinkler Cabinets: Finished, wall-mounted, steel cabinet with hinged cover, and with space for minimum of 24 spare sprinklers plus sprinkler wrench. Include number of sprinklers required by NFPA 13 and sprinkler wrench. Include separate cabinet with sprinklers and wrench for each type of sprinkler used on Project.

1.07 QUALITY ASSURANCE

- A. Installer Qualifications: Installer's responsibilities include designing, fabricating, and installing sprinkler systems and providing design services.

- B. Contractor shall have five years of experience in design and installation of equipment and systems similar to that specified hereunder. Contractor shall have an office within 100 miles radius of job site which can provide emergency maintenance service.
- C. The system designer shall be responsible for verifying site conditions, design requirements, and work being performed by other trades as related to the suppression system design. Design shall accommodate work being performed by other trades. Contractor shall identify areas of the building which will be subject to freezing.
- D. Welding Qualifications: Qualify procedures and operators according to 2010 ASME Boiler and Pressure Vessel Code.

1.08 FIELD CONDITIONS

- A. Interruption of Existing Sprinkler Service: Refer to requirements in Section 21 0500 – General Fire Protection Provisions.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. Sprinkler system sizing, arrangement, equipment, specialties, accessories, installation, and testing shall comply with NFPA 13.
- B. Standard-Pressure Piping System Component: Listed for 175-psig minimum working pressure.
- C. Design Requirements:
 - 1. Sprinkler system design shall be approved by authorities having jurisdiction (AHJ).
 - 2. Margin of Safety for Available Water Flow: 10%.
 - 3. Margin of Safety for Available Water Pressure: 10 psi.
 - 4. Sprinkler Occupancy Hazard Classifications as indicated on fire zoning plans:
 - a. Libraries – Large stack room areas: Ordinary Hazard Group 2
 - b. Electrical Equipment Rooms: Ordinary Hazard, Group 1.
 - c. General Storage Areas: Ordinary Hazard, Group 1.
 - d. Libraries except Stack Areas: Light Hazard.
 - e. Library Stack Areas: Ordinary Hazard, Group 2.
 - f. Mechanical Equipment Rooms: Ordinary Hazard, Group 1.
 - g. Office and Public Areas: Light Hazard.
 - 5. Provide minimum density as required by NFPA 13.
 - 6. Seismic Performance: Sprinkler piping shall withstand the effects of earthquake motions according to NFPA 13 and ASCE/SEI 7.

2.02 STEEL PIPE AND FITTINGS

- A. Standard-Weight, Schedule 40, Black-Steel Pipe: ASTM A 53/A 53M, Type E, Grade B. Pipe ends may be factory or field formed to match joining method.
- B. Schedule 10, Black-Steel Pipe: ASTM A 135/A 135M or ASTM A 795/A 795M, Schedule 10 in NPS 2 and smaller.
- C. Black-Steel Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M, standard-weight, seamless steel pipe with threaded ends.
- D. Uncoated-Steel Couplings: ASTM A 865/A 865M, threaded.
- E. Uncoated, Gray-Iron Threaded Fittings: ASME B16.4, Class 125, standard pattern.
- F. Malleable- or Ductile-Iron Unions: UL 860.
- G. Cast-Iron Flanges: ASME 16.1, Class 125.
- H. Steel Flanges and Flanged Fittings: ASME B16.5, Class 150.
 - 1. Metal, Pipe-Flange Bolts and Nuts: Carbon steel unless otherwise indicated.
- I. Grooved-Joint, Steel-Pipe Appurtenances:
 - 1. Pressure Rating: 175-psig minimum.
 - 2. Painted Grooved-End Fittings for Steel Piping: ASTM A 47/A 47M, malleable-iron casting or ASTM A 536, ductile-iron casting, with dimensions matching steel pipe.

3. Grooved-End-Pipe Couplings for Steel Piping: AWWA C606 and UL 213 rigid pattern, unless otherwise indicated, for steel-pipe dimensions. Include ferrous housing sections, EPDM-rubber gasket, and bolts and nuts.

2.03 SPRINKLER PIPING SPECIALTIES

- A. Branch Outlet Fittings:
 1. Standard: UL 213.
 2. Pressure Rating: 175-psig minimum.
 3. Body Material: Ductile-iron housing with EPDM seals and bolts and nuts.
 4. Type: Mechanical-tee and -cross fittings.
 5. Configurations: Snap-on and strapless, ductile-iron housing with branch outlets.
 6. Size: Of dimension to fit onto sprinkler main and with outlet connections as required to match connected branch piping.
 7. Branch Outlets: Grooved, plain-end pipe, or threaded.
- B. Adjustable Drop Nipples:
 1. Standard: UL 1474.
 2. Pressure Rating: 250-psig minimum.
 3. Body Material: Steel pipe with EPDM-rubber O-ring seals.
 4. Size: Same as connected piping.
 5. Length: Adjustable.
 6. Inlet and Outlet: Threaded.
- C. Flexible Sprinkler Hose Fittings:
 1. Standard: UL 2443.
 2. Type: Flexible hose for connection to sprinkler, and with bracket for connection to ceiling grid.
 3. Pressure Rating: 175-psig minimum.
 4. Size: Same as connected piping, for sprinkler.

2.04 SPRINKLERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Reliable Automatic Sprinkler Co., Inc. (The).
 2. Tyco Fire Products LP.
 3. Victaulic Company.
 4. Viking Corporation
- B. Listed in UL's "Fire Protection Equipment Directory" or FM Global's "Approval Guide."
- C. Pressure Rating for Automatic Sprinklers: 175-psig minimum.
- D. Automatic Sprinklers with Heat-Responsive Element:
 1. Quick Response Applications: UL 2443.
 2. Nonresidential Applications: UL 199.
 3. Characteristics: Nominal 1/2-inch orifice with Discharge Coefficient K of 5.6, and for "Ordinary" temperature classification rating unless otherwise indicated or required by application.
- E. Sprinkler Finishes: Chrome plated bronze and painted.
- F. Sprinkler Escutcheons: Materials, types, and finishes for the following sprinkler mounting applications. Escutcheons for concealed, flush, and recessed-type sprinklers are specified with sprinklers.
 1. Ceiling Mounting: Chrome-plated steel, one-piece, flat.
 2. Sidewall Mounting: Chrome-plated steel, one-piece, flat.

PART 3 - EXECUTION

3.01 PIPING INSTALLATION

- A. Locations and Arrangements: Drawing plans, schematics, and diagrams indicate general location and arrangement of piping. Install piping as indicated on approved working plans.

1. Deviations from approved working plans for piping require written approval from authorities having jurisdiction. File written approval with Architect before deviating from approved working plans.
 2. Coordinate layout and installation of sprinklers with other construction that penetrates ceilings, including light fixtures, HVAC equipment, and partition assemblies.
- B. Piping Standard: Comply with NFPA 13 requirements for installation of sprinkler piping.
 - C. Install seismic restraints on piping. Comply with NFPA 13 requirements for seismic-restraint device materials and installation.
 - D. Use listed fittings to make changes in direction, branch takeoffs from mains, and reductions in pipe sizes.
 - E. Install unions adjacent to each valve in pipes NPS 2 and smaller.
 - F. Install flanges, flange adapters, or couplings for grooved-end piping on valves, apparatus, and equipment having NPS 2-1/2-inch and larger end connections.
 - G. Install sprinkler piping with drains for complete system drainage.
 - H. Install hangers and supports and seismic restraint for sprinkler system piping according to NFPA 13.
 - I. Fill sprinkler system piping with water.

3.02 JOINT CONSTRUCTION

- A. Install couplings, flanges, flanged fittings, unions, nipples, and transition and special fittings that have finish and pressure ratings same as or higher than system's pressure rating for aboveground applications unless otherwise indicated.
- B. Install unions adjacent to each valve in pipes NPS 2 and smaller.
- C. Install flanges, flange adapters, or couplings for grooved-end piping on valves, apparatus, and equipment having NPS 2-1/2-inch and larger end connections.
- D. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- E. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.
- F. Flanged Joints: Select appropriate gasket material in size, type, and thickness suitable for water service. Join flanges with gasket and bolts according to ASME B31.9.
- G. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 1. Apply appropriate tape or thread compound to external pipe threads.
 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.
- H. Steel-Piping, Cut-Grooved Joints: Cut square-edge groove in end of pipe according to AWWA C606. Assemble coupling with housing, gasket, lubricant, and bolts. Join steel pipe and grooved-end fittings according to AWWA C606 for steel-pipe joints.
- I. Steel-Piping, Roll-Grooved Joints: Roll rounded-edge groove in end of pipe according to AWWA C606. Assemble coupling with housing, gasket, lubricant, and bolts. Join steel pipe and grooved-end fittings according to AWWA C606 for steel-pipe grooved joints.
- J. Dissimilar-Material Piping Joints: Make joints using adapters compatible with materials of both piping systems.

3.03 SPRINKLER INSTALLATION

- A. Install sprinklers in suspended ceilings in center of narrow dimension of acoustical ceiling panels.
- B. Install dry-type sprinklers with water supply from heated space. Do not install wet-type sprinklers in areas subject to freezing.

- C. Install sprinklers into flexible, sprinkler hose fittings, and install hose into bracket on ceiling grid.

3.04 IDENTIFICATION

- A. Install labeling and pipe markers on equipment and piping according to requirements in NFPA 13.

3.05 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Leak Test: After installation, charge systems and test for leaks. Repair leaks and retest until no leaks exist.
 - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
 - 3. Flush, test, and inspect sprinkler systems according to NFPA 13, "Systems Acceptance" Chapter.
 - 4. Energize circuits to electrical equipment and devices.
- B. Prepare test and inspection reports.

3.06 CLEANING

- A. Clean dirt and debris from sprinklers.
- B. Only sprinklers with their original factory finish are acceptable. Remove and replace any sprinklers that are painted or have any other finish than their original factory finish.

3.07 PIPING SCHEDULE

- A. Sprinkler specialty fittings may be used, downstream of control valves, instead of specified fittings.
- B. Standard-pressure, wet-pipe sprinkler system, NPS 2 inches and smaller, shall be the following:
 - 1. Standard-weight, Schedule 40 with threaded ends; uncoated, gray-iron threaded fittings; and threaded joints.
- C. Standard-pressure, wet-pipe sprinkler system, NPS 2-1/2-inch and larger shall be one of the following:
 - 1. Schedule 10, black-steel pipe with roll-grooved ends: uncoated, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.

3.08 SPRINKLER SCHEDULE

- A. Use sprinkler types in subparagraphs below for the following applications:
 - 1. Rooms without Ceilings: Upright sprinklers.
 - 2. Rooms with Suspended Ceilings: Recessed sprinklers.
 - 3. Wall Mounting: Sidewall sprinklers.
 - 4. Light hazard fire sprinklers: Quick response.
 - 5. Spaces Subject to Freezing: Upright, pendent, dry sprinklers; and sidewall, dry sprinklers as indicated.
- B. Provide sprinkler types in subparagraphs below with finishes indicated.
 - 1. Concealed Sprinklers: Rough brass, with factory-painted white cover plate.
 - 2. Flush Sprinklers: Bright chrome, with painted white escutcheon.
 - 3. Recessed Sprinklers: Bright chrome, with bright chrome escutcheon.
 - 4. Upright, Pendent, and Sidewall Sprinklers: Chrome plated in finished spaces exposed to view; rough bronze in unfinished spaces not exposed to view.

END OF SECTION

SECTION 22 0500
GENERAL PLUMBING PROVISIONS

PART 1 - GENERAL

1.01 CONTRACT DOCUMENTS

- A. General plumbing provisions apply to all work performed in Division 22.
- B. The Contract Documents are complementary. What is required by any one, as affects this Division, shall be as binding as if repeated herein.
- C. Separation of this Division from other Contract Documents shall not be construed as segregation of the Work.
- D. Location of equipment on Drawings is approximate. Plan exact location with respect to site measurements and work of other trades prior to starting work. If measurements differ slightly, modify work. If measurements differ substantially, notify Architect/Engineer and Owner's Authorized Representative prior to fabrication.
- E. Make minor changes in equipment connections and equipment locations as directed or required before rough-in without extra cost.
- F. For products specified by listing one or more manufacturers, followed by "Similar to" and one manufacturer's model number, the following requirements apply:
 - 1. Approval of each listed manufacturer is contingent upon that manufacturer having a product which meets the specification, fits in the available space, and is comparable to the listed model.
 - 2. Electrical requirements, duct connections, pipe connections, and space requirements indicated on the Drawings are based on the listed model and may not be suitable for all manufacturers listed. Provide revisions required to accommodate the model actually furnished.
- G. For product specified by listing one or more manufacturers, followed by a model number for each manufacturer, the following requirements apply:
 - 1. Provide one of the listed model numbers or an approved substitution.
 - 2. Electrical requirements, duct connections, pipe connections, and space requirements indicated on the Drawings are based on one of the listed models, and may not be suitable for all models listed. Provide revisions required to accommodate the model actually furnished.

1.02 DEFINITIONS

- A. Authority Having Jurisdiction (AHJ): The governmental agency or sub-agency which regulates the construction process.
- B. Owner's Authorized Representative (OAR): Owner's representative with authority to act on Owner's behalf.
- C. Architect/Engineer: The design professional leading the design team and can be either an architect or engineer.
- D. The words furnish, install and provide are defined as follows:
 - 1. Furnish: To supply and deliver to the project ready for installation and in operable condition.
 - 2. Install: To place in final position, complete, anchored, connected in operable condition.
 - 3. Provide: To furnish and install complete. Includes the supply of specified services.
 - 4. When neither furnish, install or provide is stated, provided is implied.

1.03 COORDINATION

- A. Check drawings of other trades to avert possible installation conflicts. Should major changes from original drawings be necessary to resolve such conflicts, notify Architect/Engineer and secure written approval and agreement on necessary adjustments before start of work.
- B. Architectural drawings govern all other drawings. Consult in detail the door swings, counter heights and similar items affecting work before rough-in.

- C. Coordinate identification systems with other trades. All plumbing and mechanical systems shall use identical piping, valve, and equipment identification and regulatory signage.

1.04 SUBMITTALS AND SHOP DRAWINGS

- A. See Division 01.
- B. Action Submittal Content
 - 1. Action submittal information not expressly required by the specifications will not be reviewed.
 - 2. Action submittal information shall be provided in sufficient detail to establish conformance with specified requirements. Where submitted literature includes multiple models, features, or options, the specific models, features, or options proposed shall be clearly indicated. Where a brief inspection shows that product data is not complete, the submittal will be rejected without review.
 - 3. Action submittal data shall be clear, concise, legible, and relevant. Where data is not properly organized and contains significant information that is not relevant, the submittal will be rejected without review.
 - 4. Action submittal requirements will be listed in individual specification sections. The following definitions apply.
 - a. Materials List: Provide tabular list of materials including specification reference, specification product name, manufacturer, model/part number, and size and/or quantity where appropriate. Do not include supplemental data, except where specifically requested.
 - b. Catalog data: Manufacturer's standard product cut sheet.
 - c. Product Data: Detailed data including dimensions, weight, materials of construction, connections, and all other information needed to confirm that the product conforms to all requirements listed in the individual specification section.
 - d. Performance Data: Capacity, input, output, flow, etc. as required to confirm that the product meets the performance requirements scheduled in the Specifications or on the Drawings.
 - e. Wiring Diagrams: Power and control wiring diagrams.
 - f. Shop Drawings: Construction drawings of items manufactured specifically for this project including dimensions, construction details, weights, and additional information to identify the physical features of the system or piece of equipment.
 - g. Installation Instructions
 - h. Special Requirements Listed: Additional requirements indicated in individual specification sections.

1.05 QUALITY ASSURANCE

- A. All materials and equipment provided hereunder shall be installed and started in complete conformance with the manufacturer's recommendations.
- B. Asbestos products or equipment or materials containing asbestos shall not be used.

1.06 DESIGN REQUIREMENTS

- A. Equipment and systems provided hereunder shall be rated to provide performance specified and scheduled on Drawings at the elevation of the project site.
- B. Materials and equipment provided hereunder shall be rated for the service conditions of the system to which they are connected including but not limited to temperature, pressure, and humidity.

1.07 CODES AND STANDARDS

- A. Applicable codes and standards shall determine minimum requirements for materials, methods, and labor practices not otherwise stated herein.
- B. Work shall comply with the Americans with Disabilities Act (ADA).

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store products in a clean and dry place.
- B. Comply with manufacturer's written rigging and installation instructions for unloading and moving to final installed location.
- C. Handle products carefully to prevent damage, breaking, denting, and scoring. Do not install damaged products.
- D. Protect products from weather, dirt, dust, water, construction debris, and physical damage.
- E. Retain factory-applied coverings on equipment to protect finishes during construction and remove just prior to operating unit.
- F. Cover unit openings before installation to prevent dirt and dust from entering inside of units. If required to remove coverings during unit installation, reapply coverings over openings after unit installation and remove just prior to operating unit.
- G. Replace installed products damaged during construction.

1.09 TEMPORARY SERVICES

- A. Provide in accordance with Division 01 as required for completion of work.
- B. Maintain existing systems operational. Owner will be responsible to operate and maintain existing equipment during the course of the project. However, any damage to existing equipment resulting directly from work under this Contract shall be repaired by the Contractor at no expense to Owner.

1.10 FIELD CONDITIONS

- A. Interruption of Existing Service: Do not interrupt water or sanitary waste services to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary services according to requirements indicated:
 - 1. Notify Owner's Authorized Representative no fewer than five business days in advance of proposed interruption of services.
- B. Do not proceed with interruption of services without written permission of Owner's Authorized Representative.

1.11 OPERATIONS AND MAINTENANCE MANUALS

- A. Furnish operation and maintenance data for project, as described herein.
- B. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF files.
 - 1. Include a directory of all subcontractors and maintenance contractors with names, addresses, and telephone numbers, indicating the area of responsibility for each.
 - 2. 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.
 - 3. Provide a composite summary table indicating each item of equipment listed in the operations and maintenance manual and its required maintenance and time period. This summary table shall be the first section in the O&M manual.
 - 4. Manual Content: Manuals shall contain complete information for each item of mechanical, electrical or other operating equipment. Include as applicable:
 - a. Manufacturer's instructions for installation, startup, operation, inspection, and maintenance.
 - b. Lubrication schedules.
 - c. Performance capacity.
 - 1) Final approved product submittals for each product included in project.
 - a) Mark the model actually provided where the literature covers more than one model. Include all submittal data corrected to "as-built" conditions within the manual.
 - b) Parts list.

- d. Maintenance schedules.
 - e. Maintenance instructions shall indicate routine-type work with step-by-step instructions that should be performed to ensure long life and proper operations. Recommended frequency of performance shall also be included.
5. File Names and Bookmarks: Bookmark 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.

1.12 RECORD DRAWINGS

- A. Provide record "as-built" drawings in accordance with Division 1 requirements. Show all deviations from contract drawings and location of underground lines by accurate dimensions from building lines. Show depth of all stub outs and underground lines. Dimension all concealed piping from column grids or building lines. Transfer all information to one hard copy of drawings at completion of project. Alternately, provide electronically using .pdf markup of contract drawings.

PART 2 - PRODUCTS

2.01 PRODUCTS AND MATERIALS

- A. All materials employed in permanent construction shall be new, full weight, in first class condition, and suitable for space provided. All similar equipment and materials shall be of one manufacturer.
- B. Equipment used as the basis of design is scheduled on drawings or designated in product specifications. If Contractor chooses to use equipment that is not the basis of design, Contractor is responsible for all re-design and construction costs associated with variations in arrangement, dimension, or capacity. Such work may include, but is not limited to, changes to facility structure or dimensions and revisions to associated plumbing and electrical systems needed to provide equal system performance and maintainability.
- C. All potable water systems and components, including but not limited to piping, fittings, valves, equipment, and fixtures, shall meet the requirements listed in Health Effects and Drinking Water System Components – Lead Content Compliance: NSF 61 and NSF 372.

2.02 ELECTRICAL EQUIPMENT

- A. Electrical Disconnect Switch: Electrical disconnect switches specified for plumbing equipment shall conform to OSHA Lock-out/Tag-out requirements.
- B. All electrical equipment shall be listed as approved for its application by the Underwriters Laboratory or other testing agency approved by the State of Oregon Electrical and Elevator Board. Approval indicates agency meets testing standard requirements for electrical safety required by Oregon Revised Statutes 479.510 through 479.855 and Oregon Administrative Rules.

2.03 FIRESTOPPING

- A. Comply with Division 07.

2.04 ACCESS DOORS AND FRAMES FOR WALLS AND CEILINGS

- A. Acceptable Manufacturers: J.L. Industries, Karp Associates, Inc., Meadowcraft, Inc., Mifab, Milcor Div.; Inryco, Inc., or Nystrom, Inc.
- B. Application: Match access door to wall or roof assembly fire rating.
- C. Access Door Assembly: Continuous welded steel construction unless otherwise indicated. Grind exposed welds smooth and flush with adjacent surfaces. Provide anchors and attachments necessary for installation indicated.
 - 1. Frames: 16 gage steel; provide flange type necessary for the installation required.
 - 2. Stainless Steel Frames and Flush Panel Doors: 14 gage stainless steel, No. 4. satin finish; concealed spring hinges or concealed piano hinge set to open 175 degrees.

3. Flush Doors: 14-gage sheet steel, with concealed spring hinges or concealed continuous piano hinge set to open 175 degrees.
 4. Lock: Screwdriver-operated cam locks, number required to hold door flush when closed.
 5. Ceiling Doors: Recessed door panel depth necessary to finish ceiling insert and install flush to adjacent finish ceiling. Reinforced 18 gage sheet steel face. Provide access sleeves for locking devices. Size: As necessary for efficient access, but not less than 24 by 24 inches. Obtain Architect/Engineer acceptance of manufacturer's standard size units which vary from sizes indicated.
- D. Fire Rated Units: Comply with NFPA 80, provide UL listed and labeled units having performance level required with insulated flush panel door, continuous piano hinge and self-closing mechanism for rated assemblies in sizes and configuration required.
 1. Vertical Doors: NFPA 252 or UL 10B.
 2. Horizontal Doors: ASTM E 119 or UL 263.
 - E. Shop Applied Coating: Corrosion resistant prime paint compatible with field applied finish specified in Division 09.
 - F. Fire-Rated Access Doors and Frames: Units complying with NFPA 80 tested according to the following test method:
 1. NFPA 252 or UL 10B for fire-rated access door assemblies installed vertically.
 2. NFPA 288 for fire-rated access door assemblies installed horizontally.

2.05 SPECIAL TOOLS AND LUBRICANTS

- A. Furnish and turn over to Owner, special tools not readily available commercially, that are required for disassembly or adjustment of equipment and machinery furnished.

PART 3 - EXECUTION

3.01 ACCESS TO EQUIPMENT AND ACCESSORIES

- A. Install equipment with sufficient access for service. Where not conveniently accessible by other means, provide adequately sized access doors for valves, motors, belts, and all other plumbing equipment requiring access for removal or maintenance. Type, size and exact location of access doors shall be coordinated with Architect/Engineer prior to work.
- B. Provide clearances for maintenance access as indicated on Drawings or as recommended by manufacturer. If access requirements shown on Drawings conflict with manufacturer's recommendations, provide larger clearance of the two.
- C. If equipment location shown on Drawings does not allow required access, notify Architect/Engineer prior to start of work.
- D. Apply and install all items in accordance with manufacturer's written instructions. Refer conflicts between the manufacturer's instructions and the contract drawings and specifications to Architect/Engineer for resolution prior to starting work.
- E. Provide access doors as required for access to plumbing equipment. Doors required for access are not necessarily shown on Drawings. Consult with Architect/Engineer for direction on placement of required doors not shown on Drawings.
 1. Comply with manufacturer's instructions for installation of access doors. Provide all necessary support and supplemental framing for assembly where the access doors are required. Set accurately in position, plumb, level, and flush to adjacent finish surfaces; and secure to support.
- F. Where ladder access is required to service elevated components, provide an installation that provides for sufficient access within ladder manufacturer's written instructions for use.
- G. Comply with OSHA regulations.

3.02 ARRANGEMENT AND INSTALLATION OF EQUIPMENT AND PIPING

- A. Coordinate location of piping, sleeves, inserts, hangers, ductwork and equipment. Locate piping, sleeves, inserts, hangers, ductwork and equipment clear of windows, doors, openings, lights, electrical outlets, and other services and utilities. Follow manufacturer's published recommendations for installation methods not otherwise specified.
- B. Equipment and Piping Support: Coordinate structural systems necessary for pipe and equipment support with pipe and equipment locations to permit proper installation.
- C. Location of pipe sleeves and chases shall be accurately coordinated with equipment and piping locations.
- D. Minor Piping: Small diameter pipe runs from drips and drains, water cooling, and similar minor services are generally not shown but must be provided. Contractor is responsible to provide all such minor piping where needed to maintain mechanical spaces clean and dry and to allow full equipment function and maintenance.
- E. Interconnection of Controls and Instruments: Generally, not shown but must be provided. This includes interconnections of sensors, transmitters, transducers, control devices, control and instrumentation panels, instruments and computer workstations. Comply with NFPA-70.
- F. Work in Existing Building: Cut required openings through existing masonry and reinforced concrete using diamond core drills. Use of pneumatic hammer type drills, impact type electric drills, and hand or manual hammer type drills, will be permitted only with approval of the Owner's Authorized Representative. Locate openings that will least affect structural slabs, columns, ribs or beams. Refer to the Architect/Engineer for determination of proper design for openings through structural sections and obtain layout approval prior to cutting or drilling into structure. After Architect/Engineer's approval, carefully cut opening through construction no larger than absolutely necessary for the required installation.
- G. Switchgear Drip Protection: Do not install piping above electrical switchgear.
- H. Inaccessible Equipment
 - 1. Where the Owner's Authorized Representative determines that the Contractor has installed equipment not conveniently accessible for operation and maintenance, equipment shall be removed and reinstalled or remedial action performed as directed at no additional cost to the Owner.
 - 2. The term "conveniently accessible" is defined as capable of being reached without the use of ladders, or without climbing or crawling under or over obstacles such as motors, fans, pumps, belt guards, transformers, high voltage lines, piping, and ductwork.

3.03 PLUMBING SYSTEMS FIRESTOPPING

- A. Do not cover firestop installations until they are examined by the Authority Having Jurisdiction, if required.
- B. Install firestopping in accordance with manufacturer's recommendations and conditions of product UL listing.

3.04 CLEANING SYSTEMS

- A. General: After all equipment and pipes are installed, system shall be thoroughly cleaned. Remove all stickers and tags from equipment or fixtures. Clean all piping systems prior to installation of insulation or painting.

3.05 START UP

- A. The Plumbing Contractor shall be responsible for proper operation of all systems and shall coordinate startup procedures, calibration and system checkout. System operational problems shall be diagnosed and corrected as required for system operation prior to Substantial Completion inspection.

- B. Start equipment in accordance with manufacturer's recommendations and under manufacturer's supervision where required. Ensure that associated strainers, electrical overloads, and other devices intended to protect the equipment are installed and functional prior to startup.
- C. Verify that piping has been flushed and cleaned prior to startup.

3.06 DEMONSTRATION

- A. General: After installation is complete, demonstrate to Architect/Engineer and Owner's Authorized Representative satisfaction as being complete and operational and entirely in conformance with Contract Documents.
- B. Preparation: Prior to demonstration, submit check-off list indicating completeness of submittals and certificates of compliance for review to Owner's Authorized Representative. Operate completed system for one week.
- C. Arrange for demonstration with Owner's Authorized Representative, Architect/Engineer, required factory technicians, and installer at least one week in advance of demonstration.

3.07 TRAINING

- A. Instruct Owner in proper operation and maintenance of equipment and systems. Instruction shall generally include topics listed in manufacturer's operations and maintenance manual. Operator instructions shall cover all aspects of manual, automatic, and safety controls. Contractor shall also instruct the Owner in the general configuration of systems and location of equipment and components.
- B. Furnish competent qualified technicians knowledgeable in the building plumbing systems and equipment provided for this project for a minimum of 1 hour on-site to instruct Owner in operation and maintenance of systems and equipment. This figure does not include additional training noted under individual specification sections. Contractor shall keep a log of this instruction including date, times, subjects, and those present and shall present such log when requested by Architect/Engineer. Contractor shall coordinate training with Owner's Project Manager and provide a schedule for training minimum two-weeks prior to Substantial Completion. All training shall be complete 30-days after Substantial Completion.
- C. Contractor shall furnish training by equipment manufacturers in addition to training described in this section where specifically listed in other sections. Contractor shall schedule training with Owner's Project Manager minimum 48-hours prior to training session. Equipment shall be fully operational prior to scheduling training session. Manufacturer's field start-up, adjustment, and service will not fulfill manufacturer's training requirement.
- D. Contractor shall coordinate operator training with the Owner's Authorized Representative as follows:
 - 1. Training Schedule: Contractor shall develop and submit a training schedule listing all required training including contractor training, manufacturer training, and factory training as specified for approval by the Owner's Authorized Representative.
 - 2. Training Record and Evaluation Section: Contractor shall maintain a Training Record documenting attendees and duration of each training session. The Contractor shall complete Training Record after each training session. Submit training record when all training is complete.

END OF SECTION

SECTION 22 0517

SLEEVES, SLEEVE SEALS, AND ESCUTCHEONS FOR PLUMBING PIPING

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes sleeves, sleeve seals, escutcheons, and related materials.

1.02 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.01 SLEEVES

- A. Galvanized-Steel-Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, with plain ends.

2.02 STACK-SLEEVE FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - 1. Jay R. Smith Mfg. Co.
 - 2. Zurn Industries
- B. Description: Manufactured, cast-iron sleeve with integral clamping flange. Include clamping ring, bolts, and nuts for membrane flashing.
 - 1. Underdeck Clamp: Clamping ring with setscrews.

2.03 GROUT

- A. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- B. Characteristics: Non-shrink; recommended for interior and exterior applications.
- C. Design Mix: 5000-psi, 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

2.04 ESCUTCHEONS

- A. One-Piece, Cast-Brass Type: With polished, chrome-plated or rough-brass finish and setscrew fastener.
- B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with chrome-plated finish and spring-clip fasteners.
- C. Split-Casting Brass Type: With polished, chrome-plated or rough-brass finish and with concealed hinge and setscrew.

PART 3 - EXECUTION

3.01 SLEEVE INSTALLATION

- A. Install sleeves for piping passing through penetrations in floors, partitions, roofs, and walls.
- B. Install sleeves in concrete floors, concrete roof slabs, and concrete walls as new slabs and walls are constructed.
 - 1. Cut sleeves to length for mounting flush with both surfaces.
 - a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches above finished floor level.
 - 2. Using grout, seal the space outside of sleeves in slabs and walls without sleeve-seal system.
- C. Install sleeves for pipes passing through interior partitions.
 - 1. Cut sleeves to length for mounting flush with both surfaces.
 - 2. Install sleeves that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation.

3. Seal annular space between sleeve and piping or piping insulation; use joint sealants appropriate for size, depth, and location of joint.
- D. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. See Section 22 0500 – General Plumbing Provisions.

3.02 STACK-SLEEVE-FITTING INSTALLATION

- A. Install stack-sleeve fittings in new slabs as slabs are constructed.
1. Install fittings that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation.
 2. Secure flashing between clamping flanges for pipes penetrating floors with membrane waterproofing.
 3. Install section of cast-iron soil pipe to extend sleeve to 2 inches above finished floor level.
 4. Extend cast-iron sleeve fittings below floor slab as required to secure clamping ring if ring is specified.
 5. Using grout, seal the space around outside of stack-sleeve fittings.
- B. Fire-Barrier Penetrations: Maintain indicated fire rating of floors at pipe penetrations. Seal pipe penetrations with firestop materials. See Section 22 0500 – General Plumbing Provisions.

3.03 SLEEVE AND SLEEVE-SEAL SCHEDULE

- A. Use sleeves and sleeve seals for the following piping-penetration applications:
1. Exterior Concrete Floors above Grade:
 - a. Stack-sleeve fittings.
 2. Concrete Slabs above Grade and Interior Partitions:
 - a. Galvanized-steel-pipe sleeves.

3.04 ESCUTCHEONS

- A. Install escutcheons for piping penetrations of walls, ceilings, and finished floors.
- B. Install escutcheons with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.
- C. Use one-piece, deep-pattern escutcheons for new piping where fittings would protrude from the wall and be exposed if standard escutcheons were used.
- D. Escutcheons for New Piping:
1. Finished Areas: One-piece, cast-brass type with polished, chrome-plated finish.
 2. Unfinished Areas: One-piece, cast-brass type, rough brass finish.
- E. Escutcheons for Existing Piping:
1. Finished Areas: Split-casting brass type with polished, chrome-plated finish.
 2. Unfinished Areas: Split-casting brass type with rough brass finish.

END OF SECTION

**SECTION 22 0523
VALVES FOR PLUMBING PIPING**

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes valves for plumbing service.

1.02 DEFINITIONS CWP: Cold working pressure.

- A. EPDM: Ethylene propylene copolymer rubber.

1.03 ACTION SUBMITTALS

- A. Provide catalog data for each type of valve.
- B. Provide certification that products comply with NSF 61.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Prepare valves for shipping as follows:
 - 1. Protect internal parts against rust and corrosion.
 - 2. Protect threads, flange faces, grooves, and weld ends.
- B. Use the following precautions during storage:
 - 1. Maintain valve end protection.
 - 2. Store valves indoors and maintain at higher-than-ambient-dew-point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS FOR VALVES

- A. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.
- B. ASME Compliance:
 - 1. ASME B16.1 for flanges on iron valves.
 - 2. ASME B16.5 for flanges on steel valves.
 - 3. ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.
 - 4. ASME B31.9 for building service piping valves.
- C. AWWA Compliance: Comply with AWWA C606 for grooved-end connections.
- D. Bronze valves shall be made with dezincification-resistant materials. Bronze valves made with copper alloy (brass) containing more than 15 percent zinc are not permitted.
- E. NSF Compliance: NSF 372 for valve materials for potable-water service.
- F. Valve Pressure-Temperature Ratings: Not less than indicated and as required for system pressures and temperatures. If valves with specified SWP classes or CWP ratings are unavailable, the same types of valves with higher SWP classes or CWP ratings may be substituted.
- G. Valve Sizes: Same as upstream piping unless otherwise indicated.

2.02 BALL VALVES

- A. NPS 3 and Smaller:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Apollo Valves/Conbraco Industries, Inc.
 - b. Hammond Valve.
 - c. Jenkins Valves; Crane Energy Flow Solutions.
 - d. NIBCO INC.
 - e. Stockham; Crane Energy Flow Solutions.
 - 2. Two-Piece Bronze Ball Valves with Full Port and Bronze or Brass Trim:
 - a. Standard: MSS SP-110.

- b. SWP Rating: 150 psig.
- c. CWP Rating: 600 psig.
- d. Body Design: Two piece.
- e. Body Material: Bronze.
- f. Ends: Threaded.
- g. Seats: PTFE.
- h. Stem: Bronze.
- i. Ball: Chrome-plated brass or Stainless-steel.
- j. Port: Full.
- k. Packing: Adjustable.

2.03 CHECK VALVES

- A. NPS 2 and Smaller:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Apollo Valves/Conbraco Industries, Inc.
 - b. Crane; Crane Energy Flow Solutions.
 - c. Hammond Valve.
 - d. Jenkins Valves; Crane Energy Flow Solutions.
 - e. Milwaukee Valve Company.
 - f. NIBCO INC.
 - g. Stockham; Crane Energy Flow Solutions.
 - 2. Class 125, Bronze Swing Check Valves with Bronze Disc
 - a. Standard: MSS SP-139, Type 3.
 - b. CWP Rating: 200 psig.
 - c. Body Design: Horizontal flow.
 - d. Body Material: ASTM B 584, bronze.
 - e. Ends: Threaded.
 - f. Disc: Bronze. Renewable seats and disc.

2.04 DRAIN VALVES

- A. NPS 2 and Smaller:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Apollo Valves/Conbraco Industries, Inc.
 - b. Hammond Valve.
 - c. Jenkins Valves; Crane Energy Flow Solutions.
 - d. NIBCO INC.
 - e. Stockham; Crane Energy Flow Solutions.
 - 2. Two-Piece Bronze Ball Valves with Full Port and Bronze or Brass Trim:
 - a. Standard: MSS SP-110.
 - b. SWP Rating: 150 psig.
 - c. CWP Rating: 600 psig.
 - d. Body Design: Two piece.
 - e. Body Material: Bronze.
 - f. Inlet: Threaded.
 - g. Outlet: Threaded with 3/4-inch male hose threaded adapter.
 - h. Seats: PTFE.
 - i. Stem: Stainless-steel.
 - j. Ball: Chrome-plated brass or Stainless-steel.
 - k. Port: Full.
 - l. Packing: Adjustable.
 - m. Cap: Brass with EPDM gasket and brass chain.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.
- B. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.
- C. Examine mating flange faces for damage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.
- D. Do not attempt to repair defective valves; replace with new valves.

3.02 VALVE INSTALLATION

- A. Install valves with unions or flanges to isolate each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.
- B. Locate valves for easy access and provide separate support where necessary.
- C. Install valves in horizontal piping with stem at or above center of pipe.
- D. Install valves in position to allow full stem movement, with handle swing in direction of flow.
- E. Install check valves a minimum of five pipe diameters away from changes of direction, pumps, or equipment that can generate turbulent flow in piping.

3.03 ADJUSTING

- A. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

3.04 GENERAL VALVE APPLICATIONS.

- A. Provide valves for isolation of services as shown on Drawings and at the following locations:
 - 1. Where piping enters the building.
 - 2. At branch connections from piping risers at each floor.
 - 3. Major branches and branches to remote equipment or fixtures for all supply and return systems.
 - 4. As required to individually isolate all equipment and maintainable devices including automatic air vents and hydronic control valves.
 - 5. To individually isolate building systems by section.
 - 6. Where piping penetrates mechanical room walls. Locate valve inside mechanical room.
 - 7. Branch connections for utility systems including piping in utility tunnels.
 - 8. Point of entry into individual suites, classroom, or laboratories for all plumbing piping systems, gas, compressed air, Nitrogen, vacuum, water, etc.

3.05 DOMESTIC HOT- AND COLD-WATER VALVE SCHEDULE

- A. Shutoff Service for Pipe NPS 3 and Smaller: Two-Piece Bronze Ball Valves with Full Port and Bronze or Brass Trim.
- B. Check Valve Service for NPS 2 and Smaller: Class 125, Bronze Swing Check Valves with Bronze Disc.
- C. Drain, Gauge Stop, Strainer Blowdown: Two-Piece Bronze Drain Valves with Full Port and Bronze or Brass Trim.

END OF SECTION

SECTION 22 0529

HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes hangers and supports for plumbing piping and equipment.

1.02 DEFINITIONS

- A. MSS: Manufacturers Standardization Society of The Valve and Fittings Industry Inc.

1.03 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Hangers and supports for plumbing piping and equipment shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to ASCE/SEI 7.
 - 1. Supports for multiple pipes, including pipe stands, shall be capable of supporting combined weight of supported systems, system contents, and test water.
 - 2. Equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

1.04 ACTION SUBMITTALS

- A. Provide submittals for products listed in the Product Table below in accordance with Section 22 0500 – General Plumbing Provisions. Submittal requirements indicated by column number designation as follows:
 - 1. Materials List
 - 2. Catalog Data
 - 3. Detailed Data
 - 4. Performance Data
 - 5. Wiring Diagrams
 - 6. Shop Drawings
 - 7. Installation Instructions
 - 8. Special Requirement listed herein.

PRODUCT TABLE	1	2	3	4	5	6	7	8
Pipe Hangers and Supports		X						
Thermal Hanger Shield Inserts		X						

1.05 QUALITY ASSURANCE

- A. Structural Steel Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

PART 2 - PRODUCTS

2.01 METAL PIPE HANGERS AND SUPPORTS

- A. Carbon-Steel Pipe Hangers and Supports:
 - 1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
 - 2. Galvanized Metallic Coatings: Pre-galvanized or hot dipped.
 - 3. Nonmetallic Coatings: Plastic coating, jacket, or liner.
 - 4. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
 - 5. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.
- B. Copper Pipe Hangers:
 - 1. Description: MSS SP-58, Types 1 through 58, copper-coated-steel, factory-fabricated components.
 - 2. Hanger Rods: Continuous-thread rod, nuts, and washer made of copper-coated steel.

2.02 TRAPEZE PIPE HANGERS

- A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural carbon-steel shapes with MSS SP-58 carbon-steel hanger rods, nuts, saddles, and U-bolts.

2.03 INSULATION INSERTS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. National Pipe Hanger Corporation.
 - 2. Pipe Shields Inc.
 - 3. Insulshield
 - 4. Uni-Grip
- B. General: Insulation insert for use with MSS Type 40 protection saddle.
- C. Insulation-Insert Material for Cold Piping: ASTM C 552, Type II cellular glass with 100-psig minimum compressive strength and vapor barrier.
- D. Insulation-Insert Material for Hot Piping: Water-repellent treated, ASTM C 533, Type I calcium silicate with 100-psig minimum compressive strength.
- E. For Trapeze or Clamped Systems: Insert and shield shall cover entire circumference of pipe.
- F. For Clevis or Band Hangers: Insert and shield shall cover lower 180 degrees of pipe.
- G. Insert Length: Extend 2 inches beyond sheet metal shield for piping operating below ambient air temperature.

2.04 FASTENER SYSTEMS

- A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened Portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
- B. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel anchors, for use in hardened Portland cement concrete; with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

2.05 PIPE POSITIONING SYSTEMS

- A. Description: IAPMO PS 42, positioning system of metal brackets, clips, and straps for positioning piping in pipe spaces; for plumbing fixtures in commercial applications.

2.06 MISCELLANEOUS MATERIALS

- A. Structural Steel: ASTM A 36/A 36M, carbon-steel plates, shapes, and bars; black and galvanized.

PART 3 - EXECUTION

3.01 HANGER AND SUPPORT INSTALLATION

- A. Metal Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.
- B. Metal Trapeze Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping, and support together on field-fabricated trapeze pipe hangers.
 - 1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.
 - 2. Field fabricate from ASTM A 36/A 36M, carbon-steel shapes selected for loads being supported. Weld steel according to AWS D1.1/D1.1M.
- C. Pipe Positioning-System Installation: Install support devices to make rigid supply and waste piping connections to each plumbing fixture.

- D. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.
- E. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.
- F. Install lateral bracing with pipe hangers and supports to prevent swaying.
- G. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.
- H. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
- I. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.
- J. Insulated Piping:
 - 1. Piping Operating Above Ambient Air Temperature:
 - a. Steel Piping 4-inches and Larger: Provide MSS Type 39 Protective Saddle.
 - b. All Other Piping: Provide Insulation Insert with MSS Type 40 protection shield.
 - 2. Piping Operating Below Ambient Air Temperature:
 - a. Provide Insulation Insert with MSS Type 40 protection shield.
 - 3. Shield Dimensions for Pipe: Not less than the following:
 - a. NPS 1/4 to NPS 3-1/2: 12 inches long and 0.048 inch thick.
 - b. NPS 4: 12 inches long and 0.06 inch thick.
 - 4. Insulation Inserts: Same thickness as piping insulation.

3.02 METAL FABRICATIONS

- A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.
- B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.
- C. Field Welding: Comply with AWS D1.1/D1.1M procedures for shielded, metal arc welding; appearance and quality of welds; and methods used in correcting welding work; and 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. Finish welds at exposed connections so no roughness shows after finishing and so contours of welded surfaces match adjacent contours.

3.03 ADJUSTING

- A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.
- B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches.

3.04 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 - 1. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- B. Touchup: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal are specified in Division 09.

- C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

3.05 HANGER SPACING

A.

PLUMBING PIPING SPACING TABLE	Maximum Horizontal Span	Maximum Spacing	Vertical
Carbon Steel and Stainless-Steel			
1-1/4 inch and smaller	7 feet	15	
1-1/2 inch to 2-1/2 inch	10 feet	15	
3 inch and larger	12 feet	15	
Copper Tubing			
3/4 inch and smaller	5 feet	10	
1 inch to 2 inch	7 feet	10	
2-1/2 inch and larger	10 feet	10	
PVC less than 100°F and CPVC less than 130°F			
All Sizes	4 feet	10	
PEX			
All sizes	32 inches	10	
Cast Iron			
All sizes	5 feet except where 10 foot lengths are installed.		

3.06 ROD SIZES

- A. Select rod diameter to not exceed the maximum safe load listed in Table 2 of MSS SP-58-2009.

3.07 HANGER AND SUPPORT SCHEDULE

- A. Single Pipe, Hung and Uninsulated
1. NPS 1/2 to NPS 3: Adjustable Steel Band Hanger, MSS Type 7.
 2. NPS 4 and Larger: Steel Clevis, MSS Type 1.
- B. Single Pipe, Hung and Insulated
1. Operating Temperature Less Than Ambient: Steel Clevis, MSS Type 1
 2. Operating Temperature Greater Than Ambient.
 - a. NPS 1/2 to NPS2: Steel Clevis, MSS Type 1.
 - b. NPS 3 and Larger: Adjustable Roller Hanger: Type 43.
- C. Multiple Pipe Trapeze or Pipe Rack: Trapeze Hanger, MSS Type 59.
1. Uninsulated Piping: Steel Strap.
 2. Insulated Piping: Adjustable Roller, MSS Type 43.
- D. Single Pipe Floor Support: Adjustable Pipe Support Saddle: MSS Type 38.
- E. Vertical Piping: For riser support and restraint see Section 22 0548 - Vibration and Seismic Controls for Plumbing Piping and Equipment.
- F. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finish.
- G. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.
- H. Use carbon-steel pipe hangers and supports, metal trapeze pipe hangers, and metal framing systems and attachments for general service applications.
- I. Use copper-plated pipe hangers and copper attachments for copper piping and tubing.
- J. To eliminate the need for seismic restraint, for piping installation where the distance from the top of the pipe to the structure is 12 inches or less for the entire run, select hanger-rod and building attachments to allow pipe movement without stress on hangers and attachments.
- K. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches for heavy loads.
 2. Steel Clevises (MSS Type 14): For 120 to 450°F piping installations.
 3. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.
 4. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450°F piping installations.
- L. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers NPS 3/4 to NPS 24.
 2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers NPS 3/4 to NPS 24 if longer ends are required for riser clamps.
- M. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches for heavy loads.
 2. Steel Clevises (MSS Type 14): For 120 to 450°F piping installations.
 3. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.
 4. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450°F piping installations.
- N. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
 2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joint construction, to attach to top flange of structural shape.
 3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
 4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
 5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
 6. C-Clamps (MSS Type 23): For structural shapes.
 7. Top-Beam Clamps (MSS Type 25): For top of beams if hanger rod is required tangent to flange edge.
 8. Side-Beam Clamps (MSS Type 27): For bottom of steel I-beams.
 9. Steel-Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.
 10. Linked-Steel Clamps with Eye Nuts (MSS Type 29): For attaching to bottom of steel I-beams for heavy loads, with link extensions.
 11. Malleable-Beam Clamps with Extension Pieces (MSS Type 30): For attaching to structural steel.
 12. Welded-Steel Brackets: For support of pipes from below or for suspending from above by using clip and rod. Use one of the following for indicated loads:
 - a. Light (MSS Type 31): 750 lb.
 - b. Medium (MSS Type 32): 1500 lb.
 - c. Heavy (MSS Type 33): 3000 lb.
 13. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
 14. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
 15. Horizontal Travelers (MSS Type 58): For supporting piping systems subject to linear horizontal movement where headroom is limited.
- O. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel-Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
 2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.

3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.
- P. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Restraint-Control Devices (MSS Type 47): Where indicated to control piping movement.
 2. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches.
 3. Spring-Cushion Roll Hangers (MSS Type 49): For equipping Type 41, roll hanger with springs.
 4. Spring Sway Braces (MSS Type 50): To retard sway, shock, vibration, or thermal expansion in piping systems.
 5. Variable-Spring Hangers (MSS Type 51): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from hanger.
 6. Variable-Spring Base Supports (MSS Type 52): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from base support.
 7. Variable-Spring Trapeze Hangers (MSS Type 53): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from trapeze support.
 8. Constant Supports: For critical piping stress and if necessary to avoid transfer of stress from one support to another support, critical terminal, or connected equipment. Include auxiliary stops for erection, hydrostatic test, and load-adjustment capability. These supports include the following types:
 - a. Horizontal (MSS Type 54): Mounted horizontally.
 - b. Vertical (MSS Type 55): Mounted vertically.
 - c. Trapeze (MSS Type 56): Two vertical-type supports and one trapeze member.
- Q. Vertical-Piping Supports: Unless otherwise required, install the following types:
1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers NPS 3/4 to NPS 24.
 2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers NPS 3/4 to NPS 24 if longer ends are required for riser clamps.
- R. Comply with MSS SP-69 for trapeze pipe-hanger selections and applications.
- S. Comply with MFMA-103 for metal framing system selections and applications.
- T. Use mechanical-expansion anchors instead of building attachments where required in concrete construction.
- U. Use pipe positioning systems in pipe spaces behind plumbing fixtures to support supply and waste piping for plumbing fixtures.

END OF SECTION

SECTION 22 0553

IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Pipe labels.
 - 2. Valve tags.
 - 3. Ceiling labels.

1.02 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples: For color, letter style, and graphic representation required for each identification material and device.
- C. Valve numbering scheme.
- D. Valve Schedules: For each piping system to include in maintenance manuals.

1.03 COORDINATION

- A. Coordinate with Divisions 21 and 23. Match manufacturer, type, and style of identification used.

PART 2 - PRODUCTS

2.01 PIPE LABELS

- A. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction.
- B. Pre-tensioned Pipe Labels: Pre-coiled, semi-rigid plastic formed to cover full circumference of pipe and to attach to pipe without fasteners or adhesive.
- C. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.
- D. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings; also include pipe size and an arrow indicating flow direction.
 - 1. Flow-Direction Arrows: Integral with piping-system service lettering to accommodate both directions or as separate unit on each pipe label to indicate flow direction.
 - 2. Lettering Size: Size letters according to ASME A13.1 for piping.

2.02 VALVE TAGS

- A. Valve Tags: Stamped or engraved with 1/4-inch letters for piping system abbreviation and 1/2-inch numbers.
 - 1. Tag Material: Brass, 0.025-inch minimum thickness and having predrilled or stamped holes for attachment hardware.
 - 2. Minimum Tag Size: 1-1/2 inches, round.
 - 3. Fasteners: Brass wire-link chain or S-hook.
- B. Valve Schedules: For each piping system, on 8-1/2-by-11-inch bond paper. Tabulate valve number, piping system, system abbreviation (as shown on valve tag), location of valve (room or space), normal-operating position (open, closed, or modulating), and variations for identification. Mark valves for emergency shutoff and similar special uses.
 - 1. Valve-tag schedule shall be included in operation and maintenance data.

2.03 CEILING LABELS

- A. Self-Adhesive Ceiling Labels: Printed clear plastic with contact-type, permanent-adhesive backing.
 - 1. Minimum Letter Size: 1/2-inch minimum height.
 - 2. Letter Color: Black.
 - 3. Label Content: Equipment identification label and number.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

3.02 GENERAL INSTALLATION REQUIREMENTS

- A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- B. Coordinate installation of identifying devices with locations of access panels and doors. Label inside of access doors with equipment name or general purpose of equipment behind access door with stenciled sign or markers.
- C. Install identifying devices before installing acoustical ceilings and similar concealment. Provide ceiling labels on ceilings or ceiling grid (not the tile) to indicate key access points for equipment, valves, and other components requiring quick access or routine maintenance that will be concealed above ceilings.

3.03 PIPE LABEL INSTALLATION

- A. Pipe Label Locations: Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:
 - 1. Near each valve and control device.
 - 2. Near each flange.
 - 3. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
 - 4. Within 3 feet of penetrations through walls, floors, ceilings, inaccessible enclosures, valves, equipment connections, and branch connections.
 - 5. At access doors, manholes, and similar access points that permit view of concealed piping.
 - 6. Near major equipment items and other points of origination and termination.
 - 7. Spaced at maximum intervals of 50 feet along each run. Reduce intervals to 25 feet in areas of congested piping and equipment.
- B. Directional Flow Arrows: Arrows shall be used to indicate direction of flow in pipes, including pipes where flow is allowed in both directions.
- C. Pipe Label Color Schedule: Letter and background color in accordance with ANSI A13.1.

3.04 VALVE-TAG INSTALLATION

- A. Install tags on valves and control devices in piping systems, except check valves, valves within factory-fabricated equipment units, shutoff valves, faucets, convenience and lawn-watering hose connections, and similar roughing-in connections of end-use fixtures and units. List tagged valves in a valve schedule.
- B. Valve-Tag Application Schedule: Tag valves according to size, shape, and color scheme and with captions similar to those indicated in the following subparagraphs:
 - 1. Valve-Tag Information. Stamped or engraved with 1/4-inch letters for piping system abbreviation and 1/2-inch valve tag numbers.

END OF SECTION

**SECTION 22 0719
PLUMBING PIPING INSULATION**

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes insulating plumbing piping services:

1.02 ACTION SUBMITTALS

- A. Provide submittals for products listed in the Product Table below in accordance with Section 22 0500 – General Plumbing Provisions. Submittal requirements indicated by column number designation as follows:
 - 1. Materials List
 - 2. Catalog Data
 - 3. Product Data
 - 4. Performance Data
 - 5. Wiring Diagrams
 - 6. Shop Drawings
 - 7. Installation Instructions
 - 8. Special Requirement listed herein.

PRODUCT TABLE	1	2	3	4	5	6	7	8
Insulation Materials		X						X
Field Applied Jackets		X						X

- B. Special Requirements
 - 1. Product Data: For each type of insulation product listed, provide thermal conductivity and water-vapor permeance.

1.03 QUALITY ASSURANCE

- A. Insulation materials and accessories shall be installed in a professional manner by skilled and experienced workers who specialize in commercial insulation work.
- B. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84 by a testing agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.
 - 1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
 - 2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.
- C. Comply with the following applicable standards and other requirements specified for miscellaneous components:
 - 1. Supply and Drain Protective Shielding Guards: ICC A117.1.

1.04 COORDINATION

- A. Coordinate sizes and locations of supports, hangers, and insulation shields specified in Section 22 0529 – Hangers and Supports for Plumbing Piping and Equipment.
- B. Coordinate clearance requirements with piping Installer for piping insulation application. Before preparing piping Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.

1.05 SCHEDULING

- A. Schedule insulation application after pressure testing systems. Insulation application may begin on segments that have satisfactory test results.
- B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.01 INSULATION MATERIALS

- A. Products shall not contain asbestos, lead, mercury, or mercury compounds.
- B. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.
- C. Mineral-Fiber, Preformed Pipe Insulation:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Johns Manville; a Berkshire Hathaway company.
 - b. Knauf Insulation.
 - c. Manson Insulation Inc.
 - d. Owens-Corning.
 - 2. Type I, 850 Deg F Materials: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 547, Type I, Grade A, with factory-applied ASJ-SSL. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

2.02 ADHESIVES

- A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated, unless otherwise indicated.
- B. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.
- C. ASJ Adhesive, and FSK Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.
- D. PVC Jacket Adhesive: Compatible with PVC jacket.

2.03 MASTICS

- A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-PRF-19565C, Type II.
- B. Vapor-Barrier Mastic: Water based; suitable for indoor use on below-ambient services.
 - 1. Water-Vapor Permeance: ASTM E 96/E 96M, Procedure B, 0.013 perm at 43-mil dry film thickness.
 - 2. Service Temperature Range: Minus 20 to plus 180°F.
 - 3. Solids Content: ASTM D 1644, 58 percent by volume and 70 percent by weight.
 - 4. Color: White.
- C. Vapor-Barrier Mastic: Solvent based; suitable for outdoor use on below-ambient services.
 - 1. Water-Vapor Permeance: ASTM F 1249, 0.05 perm at 30-mil dry film thickness.
 - 2. Service Temperature Range: Minus 50 to plus 220°F.
 - 3. Solids Content: ASTM D 1644, 33 percent by volume and 46 percent by weight.
 - 4. Color: White.

2.04 FACTORY-APPLIED JACKETS

- A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:
 - 1. ASJ-SSL: ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C 1136, Type I.

2.05 FIELD-APPLIED JACKETS

- A. Field-applied jackets shall comply with ASTM C 921, Type I, unless otherwise indicated.
- B. PVC Jacket: High-impact-resistant, UV-resistant PVC complying with ASTM D 1784, Class 16354-C; thickness as scheduled; roll stock ready for shop or field cutting and forming. Thickness is indicated in field-applied jacket schedules.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Johns Manville; a Berkshire Hathaway company.
 - b. P.I.C. Plastics, Inc.

- c. Proto Corporation.
- 2. Adhesive: As recommended by jacket material manufacturer.
- 3. Color: White.
- 4. Factory-fabricated fitting covers to match jacket if available; otherwise, field fabricate.
 - a. Shapes: 45- and 90-degree, short- and long-radius elbows, tees, valves, flanges, unions, reducers, end caps, soil-pipe hubs, traps, mechanical joints, and P-trap and supply covers for lavatories.

2.06 TAPES

- A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.
 - 1. Width: 3 inches.
 - 2. Thickness: 11.5 mils.
 - 3. Adhesion: 90 ounces force/inch in width.
 - 4. Elongation: 2 percent.
 - 5. Tensile Strength: 40 lbf/inch in width.
 - 6. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.
- B. PVC Tape: White vapor-retarder tape matching field-applied PVC jacket with acrylic adhesive; suitable for indoor and outdoor applications.
 - 1. Width: 2 inches.
 - 2. Thickness: 6 mils.
 - 3. Adhesion: 64 ounces force/inch in width.
 - 4. Elongation: 500 percent.
 - 5. Tensile Strength: 18 lbf/inch in width.
- C. Aluminum-Foil Tape: Vapor-retarder tape with acrylic adhesive.
 - 1. Width: 2 inches.
 - 2. Thickness: 3.7 mils.
 - 3. Adhesion: 100 ounces force/inch in width.
 - 4. Elongation: 5 percent.
 - 5. Tensile Strength: 34 lbf/inch in width.

2.07 PROTECTIVE SHIELDING GUARDS

- A. Protective Shielding Pipe Covers
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Insul-Tect Products Co.
 - b. McGuire Manufacturing.
 - c. Plumberex Specialty Products, Inc.
 - d. Truebro.
 - 2. Description: Manufactured plastic wraps for covering plumbing fixture trap and drain piping. Comply with Americans with Disabilities Act (ADA) requirements.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.
 - 1. Verify that systems to be insulated have been tested and are free of defects.
 - 2. Verify that surfaces to be insulated are clean and dry.
 - 3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.
- B. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use demineralized water.

3.03 GENERAL INSTALLATION REQUIREMENTS

- A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of piping including fittings, valves, and specialties.
- B. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.
- C. Install insulation with longitudinal seams at top and bottom of horizontal runs.
- D. Install multiple layers of insulation with longitudinal and end seams staggered.
- E. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.
- F. Keep insulation materials dry during application and finishing.
- G. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.
- H. Install insulation with least number of joints practical.
- I. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
 - 1. Install insulation continuously through hangers and around anchor attachments.
 - 2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
 - 3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
 - 4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.
- J. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.
- K. Install insulation with factory-applied jackets as follows:
 - 1. Draw jacket tight and smooth.
 - 2. Cover circumferential joints with 3-inch-wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.
 - 3. Overlap jacket longitudinal seams at least 1-1/2 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 4 inches o.c.
 - a. For below-ambient services, apply vapor-barrier mastic over staples.
 - 4. Cover joints and seams with tape, according to insulation material manufacturer's written instructions, to maintain vapor seal.
 - 5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to pipe flanges and fittings.
- L. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.
- M. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.
- N. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.
- O. For above-ambient services, do not install insulation to the following:
 - 1. Vibration-control devices.
 - 2. Testing agency labels and stamps.
 - 3. Nameplates and data plates.
 - 4. Cleanouts.

3.04 PENETRATIONS

- A. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.
 - 1. Seal penetrations with flashing sealant.
 - 2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
 - 3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches.
 - 4. Seal jacket to wall flashing with flashing sealant.
- B. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.
- C. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions.
 - 1. Comply with requirements in Section 22 0500 – General Plumbing Provisions for firestopping and fire-resistive joint sealers.
- D. Insulation Installation at Floor Penetrations:
 - 1. Pipe: Install insulation continuously through floor penetrations.
 - 2. Seal penetrations through fire-rated assemblies. Comply with requirements in Section 22 0500 – General Plumbing Provisions.

3.05 GENERAL PIPE INSULATION INSTALLATION

- A. Requirements in this article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.
- B. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:
 - 1. Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity unless otherwise indicated.
 - 2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.
 - 3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
 - 4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.
 - 5. Insulate strainers using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Fill joints, seams, and irregular surfaces with insulating cement. Insulate strainers so strainer basket flange or plug can be easily removed and replaced without damaging the insulation and jacket. Provide a removable reusable insulation cover. For below-ambient services, provide a design that maintains vapor barrier.
 - 6. Insulate flanges and unions using a section of oversized preformed pipe insulation. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker.
 - 7. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below-ambient services and a breather mastic for

- above-ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.
8. For services not specified to receive a field-applied jacket except for flexible elastomeric, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing using PVC tape.
 9. Stencil or label the outside insulation jacket of each union with the word "union." Match size and color of pipe labels.
- C. Insulate instrument connections for thermometers, pressure gages, pressure temperature taps, test connections, flow meters, sensors, switches, and transmitters on insulated pipes. Shape insulation at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.
- D. Install removable insulation covers at the following:
1. Valves
 2. Flanges and unions requiring access to allow equipment service.
 3. Mechanical couplings requiring access to allow equipment service.

3.06 INSTALLATION OF MINERAL-FIBER INSULATION

- A. Insulation Installation on Straight Pipes and Tubes:
1. Secure each layer of preformed pipe insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
 2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
 3. For insulation with factory-applied jackets on above-ambient surfaces, secure laps with outward clinched staples at 6 inches o.c.
 4. For insulation with factory-applied jackets on below-ambient surfaces, do not staple longitudinal tabs. Instead, secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.
- B. Insulation Installation on Pipe Flanges:
1. Install preformed pipe insulation to outer diameter of pipe flange.
 2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
 3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with mineral-fiber blanket insulation.
 4. Install jacket material with manufacturer's recommended adhesive, overlap seams at least 1 inch, and seal joints with flashing sealant.
- C. Insulation Installation on Pipe Fittings and Elbows:
1. Install preformed sections of same material as straight segments of pipe insulation when available.
 2. When preformed insulation elbows and fittings are not available, install mitered sections of pipe insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire or bands.
- D. Insulation Installation on Valves and Pipe Specialties:
1. Install preformed sections of same material as straight segments of pipe insulation when available.
 2. When preformed sections are not available, install mitered sections of pipe insulation to valve body.
 3. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
 4. Install insulation to flanges as specified for flange insulation application.

3.07 FIELD-APPLIED JACKET INSTALLATION

- A. Where PVC jackets are indicated, install with 1-inch overlap at longitudinal seams and end joints. Seal with manufacturer's recommended adhesive.

1. Apply two continuous beads of adhesive to seams and joints, one bead under lap and the finish bead along seam and joint edge.

3.08 PIPING INSULATION THICKNESS

A. General

1. For piping smaller than 1-1/2 inches and located in partitions within conditioned spaces, reduction of thickness by 1-inch permitted to a thickness not less than 1-inch.

B. Mineral Fiber Insulation

FIBERGLASS					
FLUID NORMAL OPERATING TEMPERATURE (°F)	NOMINAL PIPE OR TUBE SIZE (inches)				
	<1	1 to < 1.5	1.5 to < 4	4 to < 8	> 8
>350	5	5	5	5	5
251-350	3.5	4.5	4.5	4.5	4.5
201-250	2.5	2.5	2.5	3	3
141-200	1.5	1.5	2	2	2
105-140	1	1	1.5	1.5	1.5
40-60	0.5	0.5	1	1	1
<40	0.5	1	1	1	1.5

3.09 PIPING INSULATION SCHEDULE, GENERAL

- A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.
- B. For all systems with an operating temperature that may be below ambient conditions, a vapor barrier must be maintained.
- C. For piping smaller than 1-1/2 inches and located in partitions within conditioned spaces, reduction of thickness by 1-inch is permitted to a thickness not less than 1-inch.
- D. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:
 1. Drainage piping located in crawl spaces.
 2. Underground piping.
 3. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

3.10 INDOOR PIPING INSULATION SCHEDULE

- A. Base insulating thickness on operating temperature unless thickness is specifically listed in section below.
- B. Potable Cold Water Piping: Normal operating temperature 50°F.
 1. Mineral-Fiber, Preformed Pipe Insulation, Type I.
- C. Potable Hot Water and Hot Water Recirculation Piping: Normal operating temperature range 105°F to 140°F.
 1. Mineral-Fiber, Preformed Pipe Insulation, Type I.
- D. Exposed Sanitary Drains, Domestic Water, Domestic Hot Water, and Stops for Plumbing Fixtures for People with Disabilities:
 1. Protective Shielding Guard.

3.11 OUTDOOR, ABOVEGROUND PIPING INSULATION SCHEDULE

- A. Sanitary Waste Piping:
 1. All Pipe Sizes: Insulation shall be the following:
 - a. Mineral-Fiber, Preformed Pipe Insulation, Type I: 2 inches thick.

3.12 INDOOR, FIELD-APPLIED JACKET SCHEDULE

- A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.
- B. If more than one material is listed, selection from materials listed is Contractor's option.
- C. Piping, Concealed:
 - 1. None.
- D. Piping, Exposed:
 - 1. PVC: 30 mils thick.

3.13 OUTDOOR, FIELD-APPLIED JACKET SCHEDULE

- A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.
- B. If more than one material is listed, selection from materials listed is Contractor's option.
- C. Piping, Exposed:
 - 1. PVC: 40 mils thick.

END OF SECTION

**SECTION 22 1116
DOMESTIC WATER PIPING**

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes pipe, fittings, and joining methods for potable water piping.

1.02 PERFORMANCE REQUIREMENTS

- A. All potable water plumbing piping, equipment, fittings, and accessories shall be capable of withstanding a maximum pressure of 125 psi and a maximum temperature of 140°F. Exceptions would include specific items of equipment where a lower operating pressure is specified.

1.03 ACTION SUBMITTALS

- A. Provide materials list for pipe and fittings.

1.04 INFORMATIONAL SUBMITTALS

- A. System purging and disinfecting activities report.

1.05 FIELD CONDITIONS

- A. Interruption of Existing Water Service: Refer to requirements in Section 22 0500 – General Plumbing Provisions.

PART 2 - PRODUCTS

2.01 PIPING MATERIALS

- A. Potable-water piping and components shall comply with NSF 14 and NSF 61 Annex G. Plastic piping components shall be marked with "NSF-pw."
- B. Comply with NSF Standard 372 for low lead.

2.02 COPPER TUBE AND FITTINGS

- A. Hard Copper Tube: ASTM B 88, Type L and ASTM B 88, Type M water tube, drawn temper.
- B. Soft Copper Tube: ASTM B 88, Type K and ASTM B 88, Type L water tube, annealed temper.
- C. Cast-Copper, Solder-Joint Fittings: ASME B16.18, pressure fittings.
- D. Wrought-Copper, Solder-Joint Fittings: ASME B16.22, wrought-copper pressure fittings.
- E. Bronze Flanges: ASME B16.24, Class 150, with solder-joint ends.
- F. Copper Unions:
 - 1. MSS SP-123.
 - 2. Cast-copper-alloy, hexagonal-stock body.
 - 3. Ball-and-socket, metal-to-metal seating surfaces.
 - 4. Solder-joint or threaded ends.

2.03 PIPING JOINING MATERIALS

- A. Pipe-Flange Gasket Materials:
 - 1. AWWA C110/A21.10, rubber, flat face, 1/8 inch thick or ASME B16.21, nonmetallic and asbestos free unless otherwise indicated.
 - 2. Full-face or ring type unless otherwise indicated.
- B. Metal, Pipe-Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.
- C. Solder Filler Metals: ASTM B 32, lead-free alloys.
- D. Flux: ASTM B 813, water flushable.

PART 3 - EXECUTION

3.01 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of domestic water piping. Install piping as indicated unless deviations to layout are approved by Engineer.
- B. Install domestic water piping level and plumb.
- C. Install piping concealed from view and protected from physical contact by building occupants unless otherwise indicated and except in equipment rooms and service areas.
- D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal, and coordinate with other services occupying that space.
- F. Install piping to permit valve servicing.
- G. Install nipples, unions, special fittings, and valves with pressure ratings the same as or higher than the system pressure rating used in applications below unless otherwise indicated.
- H. Install piping free of sags and bends.
- I. Install fittings for changes in direction and branch connections.
- J. Install unions in copper tubing at final connection to each piece of equipment, machine, and specialty.

3.02 JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.
- C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - 1. Apply appropriate tape or thread compound to external pipe threads.
 - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.
- D. Soldered Joints for Copper Tubing: Apply ASTM B 813, water-flushable flux to end of tube. Join copper tube and fittings according to ASTM B 828 or CDA's "Copper Tube Handbook."
- E. Flanged Joints: Select appropriate asbestos-free, nonmetallic gasket material in size, type, and thickness suitable for domestic water service. Join flanges with gasket and bolts according to ASME B31.9.

3.03 DIELECTRIC FITTING INSTALLATION

- A. Provide screwed brass union or screwed brass valve where dissimilar metals meet.

3.04 HANGER AND SUPPORT INSTALLATION

- A. Comply with requirements for pipe hanger, support products, and installation in Section 22 0529 – Hangers and Supports for Plumbing Piping and Equipment.
- B. Support vertical piping and tubing at base and at each floor.

3.05 CONNECTIONS

- A. When installing piping adjacent to equipment and machines, allow space for service and maintenance.
- B. Connect domestic water piping to water-service piping with shutoff valve.
- C. Connect to equipment with pipe sizes indicated but not smaller than the size of the equipment connection. Use flanges instead of unions on equipment NPS 2-1/2 inch and larger.

3.06 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Piping Inspections:
 - a. Do not enclose, cover, or put piping into operation until it has been inspected and approved by authorities having jurisdiction.
 - b. Arrange for inspection in accordance with authority having jurisdiction.
 - c. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
 - 2. Piping Tests:
 - a. Fill domestic water piping. Check components to determine that they are not air bound and that piping is full of water.
 - b. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit a separate report for each test, complete with diagram of portion of piping tested.
 - c. Leave new, altered, extended, or replaced domestic water piping uncovered and unconcealed until it has been tested and approved. Expose work that was covered or concealed before it was tested.
 - d. Cap and subject piping to static water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow it to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.
 - e. Repair leaks and defects with new materials, and retest piping or portion thereof until satisfactory results are obtained.
 - f. Prepare reports for tests and for corrective action required.
- B. Prepare test and inspection reports.

3.07 ADJUSTING

- A. Perform the following adjustments before operation:
 - 1. Close drain valves, hydrants, and hose bibbs.
 - 2. Open shutoff valves to fully open position.
 - 3. Open throttling valves to proper setting.
 - 4. Adjust balancing valves in hot-water-circulation return piping to provide adequate flow.
 - a. Manually adjust ball-type balancing valves in hot-water-circulation return piping to provide hot-water flow in each branch.
 - b. Adjust calibrated balancing valves to flows indicated.
 - 5. Remove plugs used during testing of piping and for temporary sealing of piping during installation.
 - 6. Remove and clean strainer screens. Close drain valves and replace drain plugs.
 - 7. Remove filter cartridges from housings and verify that cartridges are as specified for application where used and are clean and ready for use.
 - 8. Check plumbing specialties and verify proper settings, adjustments, and operation.

3.08 CLEANING

- A. Clean and disinfect potable domestic water piping as follows:
 - 1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
 - 2. Use purging and disinfecting procedures prescribed by authorities having jurisdiction; if methods are not prescribed, use procedures described in either AWWA C651 or AWWA C652 or follow procedures described below:
 - a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
 - b. Fill and isolate system according to either of the following:
 - 1) Fill system or part thereof with water/chlorine solution with at least 50 ppm of chlorine. Isolate with valves and allow to stand for 24 hours.
 - 2) Fill system or part thereof with water/chlorine solution with at least 200 ppm of chlorine. Isolate and allow to stand for three hours.

- c. Flush system with clean, potable water until no chlorine is in water coming from system after the standing time.
- d. Repeat procedures if biological examination shows contamination.
- e. Submit water samples in sterile bottles to authorities having jurisdiction.

3.09 PIPING SCHEDULE

- A. Transition and special fittings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.
- B. Flanges and unions may be used for aboveground piping joints unless otherwise indicated.
- C. Aboveground domestic water piping, NPS 2 and smaller, shall be the following:
 1. Hard copper tube, ASTM B 88, Type L; cast- or wrought-copper, solder-joint fittings; and soldered joints.

END OF SECTION

**SECTION 22 1119
DOMESTIC WATER PIPING SPECIALTIES**

PART 1 - GENERAL

1.01 ACTION SUBMITTALS

- A. Provide submittals for products listed in the Product Table below in accordance with Section 22 0500 – General Plumbing Provisions. Submittal requirements indicated by column number designation as follows:
1. Materials List
 2. Catalog Data
 3. Product Data
 4. Performance Data
 5. Wiring Diagrams
 6. Shop Drawings
 7. Installation Instructions
 8. Special Requirement listed herein.

PRODUCT TABLE	1	2	3	4	5	6	7	8
All Items this Section		X						

1.02 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.03 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For domestic water piping specialties to include in emergency, operation, and maintenance manuals.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS FOR PIPING SPECIALTIES

- A. Potable-water piping and components shall comply with NSF 61 Annex G.

2.02 PERFORMANCE REQUIREMENTS

- A. Minimum Working Pressure for Domestic Water Piping Specialties: 125 psig unless otherwise indicated.

2.03 TEMPERATURE-ACTUATED, WATER MIXING VALVES

- A. Individual-Fixture, Water Tempering Valves:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Acorn Engineering Company.
 - b. Apollo Valves; Conbraco Industries, Inc.
 - c. Lawler Manufacturing Company, Inc.
 - d. Leonard Valve Company.
 - e. Powers.
 - f. Watts; a Watts Water Technologies company.
 - g. Zurn Industries, LLC.
 2. Standard: ASSE 1070, thermostatically controlled, water tempering valve.
 3. Pressure Rating: 125 psig minimum unless otherwise indicated.
 4. Body: Bronze body with corrosion-resistant interior components.
 5. Temperature Control: Adjustable.
 6. Inlets and Outlet: Threaded.
 7. Finish: Rough or chrome-plated bronze.
 8. Tempered-Water Setting: 110°F.

2.04 STEEL, PRECHARGED, POTABLE-WATER EXPANSION TANKS

- A. Steel, Precharged, Diaphragm, Expansion Tanks:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. AMTROL, Inc.
 - b. Bell & Gossett.
 - c. TACO Comfort Solutions, Inc.
 - d. Watts Water Technologies.
 - e. Wessels Company.
2. Description: Steel, vertical, pressured-rated tank with cylindrical sidewalls and with air-charging valve and air precharge.
3. Fabricate supports and attachments to tank with reinforcement strong enough to resist tank movement during seismic event when tank supports are anchored to building structure.
4. Operation: Factory-installed, butyl-rubber diaphragm.
5. Tank Interior Finish: Materials and thicknesses complying with NSF 61 Annex G barrier materials for potable-water tank linings. Extend finish into and through tank fittings and outlets.
 - a. Lining Material: Polypropylene.

2.05 DRAIN VALVES

- A. Ball-Valve-Type, Hose-End Drain Valves:
 1. Standard: MSS SP-110 for standard-port, two-piece ball valves.
 2. Pressure Rating: 400-psig minimum CWP.
 3. Size: NPS 3/4.
 4. Body: Copper alloy.
 5. Ball: Chrome-plated brass.
 6. Seats and Seals: Replaceable.
 7. Handle: Vinyl-covered steel.
 8. Inlet: Threaded or solder joint.
 9. Outlet: Threaded, short nipple with garden-hose thread complying with ASME B1.20.7 and cap with seal and brass chain.

2.06 WATER-HAMMER ARRESTERS

- A. Water-Hammer Arresters:
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Jay R. Smith Mfg. Co.
 - b. Josam Company.
 - c. MIFAB, Inc.
 - d. Precision Plumbing Products.
 - e. Watts; a Watts Water Technologies company.
 - f. Zurn Industries, LLC.
 2. Standard: ASSE 1010 or PDI-WH 201.
 3. Type: Copper tube with piston, factory pressurized and sealed.
 4. Size: ASSE 1010, Sizes AA and A through F, or PDI-WH 201, Sizes A through F.

2.07 FLEXIBLE CONNECTORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Flex-Hose Co., Inc.
 2. Flexicraft Industries.
 3. Metraflex Company (The).
 4. Universal Metal Hose.
- B. Bronze-Hose Flexible Connectors: Corrugated-bronze tubing with bronze wire-braid covering and ends brazed to inner tubing.
 1. Working-Pressure Rating: Minimum 200 psig.
 2. End Connections NPS 2 and Smaller: Threaded copper pipe or plain-end copper tube.

3. End Connections NPS 2-1/2 and Larger: Flanged copper alloy.
- C. Stainless-Steel-Hose Flexible Connectors: Corrugated-stainless-steel tubing with stainless-steel wire-braid covering and ends welded to inner tubing.
 1. Working-Pressure Rating: Minimum 200 psig.
 2. End Connections NPS 2 and Smaller: Threaded steel-pipe nipple.
 3. End Connections NPS 2-1/2 and Larger: Flanged steel nipple.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install temperature-actuated, water mixing valves with check stops or shutoff valves on inlets and with shutoff valve on outlet.
- B. Install expansion tanks level and plumb, firmly anchored. Arrange so devices needing servicing are accessible.
 1. After installing tanks with factory finish, inspect finishes and repair damages to finishes.
 2. Install piping adjacent to potable-water tanks to allow service and maintenance.
 3. Connect water piping to potable water tanks with unions or flanges.
 - a. Shutoff Valves: Provide shutoff valves at water piping connections to potable water storage tanks. Shutoff valves for expansion tanks shall be normally-open, lockable valves.
 - b. Water Piping Connections: Make connections to dissimilar metals with dielectric fittings.
- C. Install water-hammer arresters in water piping according to PDI-WH 201.

3.02 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 1. Verify that air precharge in precharged expansion tanks is correct.
- B. Domestic water piping specialties will be considered defective if they do not pass tests and inspections.
- C. Prepare test and inspection reports.

3.03 ADJUSTING

- A. Set field-adjustable temperature set points of temperature-actuated, water mixing valves.

END OF SECTION

SECTION 22 1316
SANITARY WASTE AND VENT PIPING

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes pipe, fittings, and joining methods for sanitary waste, vent and storm drain piping.

1.02 PERFORMANCE REQUIREMENTS

- A. Components and installation shall be capable of withstanding the following minimum working pressure unless otherwise indicated:
 - 1. Soil, Waste, and Vent Piping: 10-foot head of water.

1.03 ACTION SUBMITTALS

- A. Provide materials list for pipe and fittings.
- B. Provide catalog data for dielectric fittings.

1.04 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.05 FIELD CONDITIONS

- A. Interruption of Existing Sanitary Waste Service: Refer to requirements in Section 22 0500 – General Plumbing Provisions.

PART 2 - PRODUCTS

2.01 PIPING MATERIALS

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.

2.02 HUBLESS, CAST-IRON SOIL PIPE AND FITTINGS

- A. Pipe and Fittings: ASTM A 888 or CISPI 301.
- B. CISPI, Hubless-Piping Couplings:
 - 1. Standards: ASTM C 1277 and CISPI 310.
 - 2. Description: Stainless-steel corrugated shield with stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve with integral, center pipe stop.

2.03 GALVANIZED-STEEL PIPE AND FITTINGS

- A. Galvanized-Steel Pipe: ASTM A 53/A 53M, Type E, Standard Weight class. Include square-cut-grooved or threaded ends matching joining method.
- B. Galvanized-Cast-Iron Drainage Fittings: ASME B16. 12, threaded.
- C. Steel Pipe Pressure Fittings:
 - 1. Galvanized-Steel Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M or ASTM A 106/A 106M, Schedule 40, seamless steel pipe. Include ends matching joining method.
 - 2. Malleable-Iron Unions: ASME B16. 39; Class 150; hexagonal-stock body with ball-and-socket, metal-to-metal, bronze seating surface; and female threaded ends.
 - 3. Galvanized-Gray-Iron, Threaded Fittings: ASME B16. 4, Class 125, standard pattern.
- D. Cast-Iron Flanges: ASME B16. 1, Class 125.
 - 1. Flange Gasket Materials: ASME B16. 21, full-face, flat, nonmetallic, asbestos-free, 1/8-inch maximum thickness unless thickness or specific material is indicated.
 - 2. Flange Bolts and Nuts: ASME B18. 2. 1, carbon steel unless otherwise indicated.

2.04 COPPER TUBE AND FITTINGS

- A. Copper Type DWV Tube: ASTM B 306, drainage tube, drawn temper.
- B. Copper Drainage Fittings: ASME B16. 23, cast copper or ASME B16. 29, wrought copper, solder-joint fittings.

- C. Solder: ASTM B 32, lead free with ASTM B 813, water-flushable flux.

2.05 SPECIALTY PIPE FITTINGS

- A. Transition Couplings:
 - 1. Fitting-Type Transition Couplings: Manufactured piping coupling or specified piping system fitting.
 - 2. Shielded, Non-pressure Transition Couplings:
 - a. Standard: ASTM C 1460.
 - b. Description: Elastomeric or rubber sleeve with full-length, corrosion-resistant outer shield and corrosion-resistant-metal tension band and tightening mechanism on each end.
 - c. End Connections: Same size as and compatible with pipes to be joined.

PART 3 - EXECUTION

3.01 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Install piping as indicated unless deviations to layout are approved by Engineer.
- B. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
- C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- D. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- E. Install piping to permit valve servicing.
- F. Install piping at indicated slopes.
- G. Install piping free of sags and bends.
- H. Install fittings for changes in direction and branch connections.
- I. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends.
 - 1. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical.
 - 2. Use long-turn, double Y-branch and 1/8-bend fittings if two fixtures are installed back to back or side by side with common drain pipe.
 - a. Straight tees, elbows, and crosses may be used on vent lines.
 - 3. Do not change direction of flow more than 90 degrees.
 - 4. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Do not reduce size of waste piping in direction of flow.
- J. Install soil and waste and vent piping at the following minimum slopes unless otherwise indicated:
 - 1. Sanitary Waste: 2 percent downward in direction of flow for piping NPS 3 and smaller.
 - 2. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.
- K. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings. "
- L. Install steel piping according to applicable plumbing code.
- M. Install aboveground copper tubing according to CDA's "Copper Tube Handbook. "
- N. Plumbing Specialties:
 - 1. Install cleanouts at grade where shown on drawings. Provide a cleanout to exterior grade wherever sanitary or storm drain piping leaves the building.
 - 2. Install cleanout fitting with closure plug inside the building in sanitary drainage force-main piping.

- O. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.
- P. Install sleeves for piping penetrations of walls, ceilings, and floors.

3.02 JOINT CONSTRUCTION

- A. Join hubless, cast-iron soil piping according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-piping coupling joints.
- B. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1. 20. 1.
 - 1. Cut threads full and clean using sharp dies.
 - 2. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - a. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
 - b. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.
 - c. Do not use pipe sections that have cracked or open welds.
- C. Join copper tube and fittings with soldered joints according to ASTM B 828. Use ASTM B 813, water-flushable, lead-free flux and ASTM B 32, lead-free-alloy solder.
- D. Flanged Joints: Align bolt holes. Select appropriate gasket material, size, type, and thickness. Install gasket concentrically positioned. Use suitable lubricants on bolt threads. Torque bolts in cross pattern.

3.03 SPECIALTY PIPE FITTING INSTALLATION

- A. Transition Couplings:
 - 1. Install transition couplings at joints of piping with small differences in ODs.
 - 2. In Waste Drainage Piping: Non-pressure shielded transition couplings.

3.04 HANGER AND SUPPORT INSTALLATION

- A. Comply with requirements for pipe hanger and support devices and installation specified in Section 22 0529 – Hangers and Supports for Plumbing Piping and Equipment.
- B. Support vertical piping and tubing at base and at each floor.

3.05 CONNECTIONS

- A. Connect waste piping in sizes indicated, but not smaller than required by plumbing code.
- B. Where installing piping adjacent to equipment, allow space for service and maintenance of equipment.
- C. Make connections according to the following unless otherwise indicated:
 - 1. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment.
 - 2. Install flanges, in piping NPS 2-1/2 and larger, adjacent to flanged valves and at final connection to each piece of equipment.

3.06 FIELD QUALITY CONTROL

- A. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
- B. Test sanitary waste and vent piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:
 - 1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired.
 - a. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
 - 2. Leave uncovered and unconcealed new, altered, extended, or replaced waste and vent piping until it has been tested and approved.
 - a. Expose work that was covered or concealed before it was tested.
 - 3. Roughing-in Plumbing Test Procedure: Test waste and vent piping except outside leaders on completion of roughing-in.

- a. Close openings in piping system and fill with water to point of overflow, but not less than 10-foot head of water.
- b. From 15 minutes before inspection starts to completion of inspection, water level must not drop.
- c. Inspect joints for leaks.
4. Finished Plumbing Test Procedure: After plumbing fixtures have been set and traps filled with water, test connections and prove they are gastight and watertight.
 - a. Plug vent-stack openings on roof and building drains where they leave building. Introduce air into piping system equal to pressure of 1-inch wg.
 - b. Use U-tube or manometer inserted in trap of water closet to measure this pressure.
 - c. Air pressure must remain constant without introducing additional air throughout period of inspection.
 - d. Inspect plumbing fixture connections for gas and water leaks.
5. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
6. Prepare reports for tests and required corrective action.

3.07 CLEANING AND PROTECTION

- A. Clean interior of piping. Remove dirt and debris as work progresses.
- B. Protect sanitary waste and vent piping during construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- C. Place plugs in ends of uncompleted piping at end of day and when work stops.

3.08 PIPING SCHEDULE

- A. All sanitary waste and underground vent piping shall be any of the following:
 1. Hubless, cast-iron soil pipe and fittings; CISPI hubless-piping couplings; and coupled joints.
 2. Hard copper tube, Type DWV; cast or wrought-copper fittings; and soldered joints.
 3. Dissimilar Pipe-Material Couplings: Non-pressure transition couplings.
- B. Aboveground, vent piping shall be any of the following:
 1. Galvanized-steel pipe, drainage fittings, and threaded joints.
 2. Hubless, cast-iron soil pipe and fittings; CISPI hubless-piping couplings; and coupled joints.
 3. Hard copper tube, Type DWV; cast or wrought-copper fittings; and soldered joints.
 4. Dissimilar Pipe-Material Couplings: Unshielded, Non-pressure transition couplings.

END OF SECTION

**SECTION 22 1319
SANITARY WASTE PIPING SPECIALTIES**

PART 1 - GENERAL

1.01 ACTION SUBMITTALS

- A. Provide submittals for products listed in the Product Table below in accordance with Section 22 0500 – General Plumbing Provisions. Submittal requirements indicated by column number designation as follows:
 - 1. Materials List
 - 2. Catalog Data
 - 3. Product Data
 - 4. Performance Data
 - 5. Wiring Diagrams
 - 6. Shop Drawings
 - 7. Installation Instructions
 - 8. Special Requirement listed herein.

PRODUCT TABLE	1	2	3	4	5	6	7	8
All Products in this Section		X						

1.02 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.03 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For sanitary waste piping specialties to include in emergency, operation, and maintenance manuals.

PART 2 - PRODUCTS

2.01 ASSEMBLY DESCRIPTIONS

- A. Sanitary waste piping specialties shall bear label, stamp, or other markings of specified testing agency.
- B. Comply with NSF 14 for plastic sanitary waste piping specialty components.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing, and marked for intended location and application.

2.02 CLEANOUTS

- A. Cast-Iron Wall Cleanouts (WCO):
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Jay R. Smith Mfg. Co.
 - b. Josam Company.
 - c. MIFAB, Inc.
 - d. Watts; a Watts Water Technologies company.
 - e. Zurn Industries, LLC.
 - 2. Standard: ASME A112.36.2M. Include wall access.
 - 3. Size: Same as connected drainage piping.
 - 4. Body: Hubless, cast-iron soil pipe.
 - 5. Closure Plug:
 - a. Brass.
 - b. Countersunk or raised head.
 - c. Drilled and threaded for cover attachment screw.
 - d. Size: Same as or not more than one size smaller than cleanout size.
 - 6. Wall Access: Round, flat, stainless-steel cover plate with screw.

2.03 THROUGH-PENETRATION FIRESTOP ASSEMBLIES

- A. Seal penetrations through fire-rated assemblies. Comply with requirements in Section 22 0500 - General Plumbing Provisions.

2.04 MISCELLANEOUS SANITARY DRAINAGE PIPING SPECIALTIES

- A. Hub Drains:
 - 1. Description: Shop or field fabricate from ASTM A 74, Service class, cast-iron soil-pipe fittings. Hub drains may be constructed of either hub-and-spigot piping or hubless piping with concentric reducer fittings. Include P-trap with primer connection, riser section; and where required, increaser fitting joined with ASTM C 564 rubber gaskets.
 - 2. Size: Same as connected waste piping.
- B. Trap-Seal Primer Fittings:
 - 1. Description: Material to match floor drain or floor sink p-trap, with threaded inlet and threaded or spigot outlet, and trap-seal primer valve connection.
 - 2. Size: Same as floor drain outlet with NPS 1/2 side inlet.
- C. Air-Gap Fittings:
 - 1. Standard: ASME A112.1.2, for fitting designed to ensure fixed, positive air gap between installed inlet and outlet piping.
 - 2. Body: Bronze or cast iron.
 - 3. Inlet: Opening in top of body.
 - 4. Outlet: Larger than inlet.
 - 5. Size: Same as connected waste piping and with inlet large enough for associated indirect waste piping.
- D. Sleeve Flashing Device:
 - 1. Description: Manufactured, cast-iron fitting, with clamping device that forms sleeve for pipe floor penetrations of floor membrane. Include galvanized-steel pipe extension in top of fitting that will extend 2 inches above finished floor and galvanized-steel pipe extension in bottom of fitting that will extend through floor slab.
 - 2. Size: As required for close fit to riser or stack piping.
- E. Expansion Joints:
 - 1. Standard: ASME A112.6.4.
 - 2. Body: Cast iron with bronze sleeve, packing, and gland.
 - 3. End Connections: Matching connected piping.
 - 4. Size: Same as connected soil, waste, or vent piping.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install floor drains at low points of surface areas to be drained. Set grates of drains flush with finished floor, unless otherwise indicated.
 - 1. Position floor drains for easy access and maintenance.
 - 2. Set floor drains below elevation of surrounding finished floor to allow floor drainage.
 - 3. Set with grates depressed according to the following drainage area radii:
 - a. Radius, 30 Inches or Less: Equivalent to 1 percent slope, but not less than 1/4-inch total depression.
 - b. Radius, 30 to 60 Inches: Equivalent to 1 percent slope.
 - c. Radius, 60 Inches or Larger: Equivalent to 1 percent slope, but not greater than 1-inch total depression.
 - 4. Install floor-drain and shower drain flashing collar or flange, so no leakage occurs between drain and adjoining flooring.
 - a. Maintain integrity of waterproof membranes where penetrated.
 - 5. Install individual traps for floor drains and shower drains connected to sanitary building drain, unless otherwise indicated.
- B. Install cleanouts in aboveground piping and building drain piping according to the following, unless otherwise indicated:

1. Size same as drainage piping up to NPS 4. Use NPS 4 for larger drainage piping unless larger cleanout is indicated.
 2. Locate at each horizontal change in direction of piping greater than 135 degrees.
 3. Locate at minimum intervals of 50 feet for piping NPS 3 and smaller and 100 feet for larger piping.
 4. Locate at base of each vertical soil and waste stack or vertical storm piping conductor.
- C. For cleanouts located in concealed piping, install cleanout wall access covers at a minimum height of 12-inches, of types indicated, with frame and cover flush with finished wall.
 - D. Install roof flashing assemblies or flashing fittings on sanitary stack vents and vent stacks that extend through roof.
 - E. Install through-penetration firestop assemblies in plastic conductors and stacks at floor penetrations.
 - F. Assemble hub drain fittings and install with top of hub a minimum of 2 inches above floor unless otherwise indicated.
 - G. Install trap-seal primer fittings on inlet to floor drains and shower drains that require trap-seal primer connection.
 1. Exception: Fitting may be omitted if the trap or drain fixture has a trap-seal primer connection.
 2. Size: Same as floor drain inlet.
 - H. Install air-gap fittings on draining-type backflow preventers and on indirect-waste piping discharge into sanitary drainage system.
 - I. Install sleeve and sleeve seals with each riser and stack passing through floors with waterproof membrane.
 - J. Install expansion joints on vertical stacks and conductors. Position expansion joints for easy access and maintenance.
 - K. Install wood-blocking reinforcement for wall-mounting-type specialties.
 - L. Install traps on plumbing specialty drain outlets. Omit traps on indirect wastes unless trap is indicated.

3.02 FLASHING INSTALLATION

- A. Fabricate flashing from single piece unless large pans, sumps, or other drainage shapes are required.
- B. Install sheet flashing on pipes, sleeves, and specialties passing through or embedded in floors and roofs with waterproof membrane.
 1. Pipe Flashing: Sleeve type, matching pipe size, with minimum length of 10 inches, and skirt or flange extending at least 8 inches around pipe.
 2. Sleeve Flashing: Flat sheet, with skirt or flange extending at least 8 inches around sleeve.
 3. Embedded Specialty Flashing: Flat sheet, with skirt or flange extending at least 8 inches around specialty.
- C. Set flashing on floors and roofs in solid coating of bituminous cement.
- D. Secure flashing into sleeve and specialty clamping ring or device.
- E. Install flashing for piping passing through roofs with counterflashing or commercially made flashing fittings, according to Division 07.
- F. Extend flashing up vent pipe passing through roofs and turn down into pipe, or secure flashing into cast-iron sleeve having calking recess.
- G. Tests and Inspections:
 1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.03 PROTECTION

- A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.
- B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION

**SECTION 22 3300
ELECTRIC, DOMESTIC-WATER HEATERS**

PART 1 - GENERAL

1.01 ACTION SUBMITTALS

- A. Provide submittals for products listed in the Product Table below in accordance with Section 22 0500 – General Plumbing Provisions. Submittal requirements indicated by column number designation as follows:
 - 1. Materials List
 - 2. Catalog Data
 - 3. Product Data
 - 4. Performance Data
 - 5. Wiring Diagrams
 - 6. Shop Drawings
 - 7. Installation Instructions
 - 8. Special Requirement listed herein.

PRODUCT TABLE	1	2	3	4	5	6	7	8
Water Heaters			X					
All Other Items this Section		X						

1.02 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of commercial, residential, and tankless, electric, domestic-water heater, from manufacturer.
- B. Domestic-Water Heater Labeling: Certified and labeled by testing agency acceptable to authorities having jurisdiction.
- C. Source quality-control reports.
- D. Field quality-control reports.
- E. Warranty: Sample of special warranty.

1.03 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For electric, domestic-water heaters to include in operation and maintenance manuals.

1.04 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1.
 - 1. Comply with efficiency requirements in ASHRAE 189.1, which supersede requirements in ASHRAE/IESNA 90.1.
- C. ASME Compliance: Where ASME-code construction is indicated, fabricate and label commercial, domestic-water heater storage tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.
- D. NSF Compliance: Fabricate and label equipment components that will be in contact with potable water to comply with NSF 61 Annex G, "Drinking Water System Components - Health Effects."

1.05 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of electric, domestic-water heaters that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including storage tank and supports.
 - b. Faulty operation of controls.

- c. Deterioration of metals, metal finishes, and other materials beyond normal use.
- 2. Warranty Periods: From date of Substantial Completion.
 - a. Commercial, Electric, Storage, Domestic-Water Heaters:
 - 1) Storage Tank: Five years.
 - 2) Controls and Other Components: One year.

PART 2 - PRODUCTS

2.01 COMMERCIAL, ELECTRIC, DOMESTIC-WATER HEATERS

- A. Commercial, Electric, Storage, Domestic-Water Heaters:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. American Water Heaters.
 - b. Bradford White Corporation.
 - c. Cemline Corporation.
 - d. Lochinvar, LLC.
 - e. Smith, A. O. Corporation.
 - f. State Industries.
 - 2. Standard: UL 1453.
 - 3. Storage-Tank Construction: Non-ASME-code, steel horizontal arrangement.
 - a. Tappings: Factory fabricated of materials compatible with tank and piping connections. Attach tappings to tank before testing.
 - 1) NPS 2 and Smaller: Threaded ends according to ASME B1.20.1.
 - 2) NPS 2-1/2 and Larger: Flanged ends according to ASME B16.5 for steel and stainless-steel flanges, and according to ASME B16.24 for copper and copper-alloy flanges.
 - b. Pressure Rating: 150 psig.
 - c. Interior Finish: Comply with NSF 61 Annex G barrier materials for potable-water tank linings, including extending lining material into tappings.
 - 4. Factory-Installed Storage-Tank Appurtenances:
 - a. Anode Rod: Replaceable magnesium.
 - b. Drain Valve: Corrosion-resistant metal complying with ASSE 1005.
 - c. Insulation: Comply with ASHRAE/IESNA 90.1.
 - d. Jacket: Steel with enameled finish.
 - e. Heating Elements: Electric, screw-in or bolt-on immersion type arranged in multiples of three.
 - f. Temperature Control: Adjustable thermostat.
 - g. Safety Controls: High-temperature-limit and low-water cutoff devices or systems.
 - h. Relief Valves: ASME rated and stamped for combination temperature-and-pressure relief valves. Include one or more relief valves with total relieving capacity at least as great as heat input, and include pressure setting less than domestic-water heater working-pressure rating. Select one relief valve with sensing element that extends into storage tank.
 - 5. Capacity: As scheduled on Drawings

2.02 DOMESTIC-WATER HEATER ACCESSORIES

- A. Heat-Trap Fittings: ASHRAE 90.2.
- B. Combination Temperature-and-Pressure Relief Valves: ASME rated and stamped. Include relieving capacity at least as great as heat input, and include pressure setting less than domestic-water heater working-pressure rating. Select relief valves with sensing element that extends into storage tank.
- C. Shock Absorbers: ASSE 1010 or PDI-WH 201, Size A water hammer arrester.
- D. Thermometer and Thermowell:
 - 1. Bi-metallic actuated Thermometers
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- 1) Ashcroft Inc.
 - 2) Marsh Bellofram.
 - 3) Palmer Wahl Instrumentation Group.
 - 4) Terrice, H. O. Co.
 - 5) Watts, A Watts Water Technologies Company.
 - 6) Weiss Instruments, Inc.
- b. Standard: ASME B40.200.
 - c. Case: Sealed type. Stainless steel with 5-inch nominal diameter.
 - d. Dial: Non-reflective aluminum with permanently etched scale markings and scales in degrees F.
 - e. Connector Type(s): Union joint, adjustable angle, rigid back, or rigid bottom selected for ease of reading. Unified-inch screw threads.
 - f. Connector Size: 1/2 inch, with ASME B1.1 screw threads.
 - g. Stem: 0.25 or 0.375 inch in diameter; stainless steel.
 - h. Window: Double strength glass or plastic.
 - i. Ring: Stainless-steel.
 - j. Element: Bimetal coil.
 - k. Pointer: Dark-colored metal.
 - l. Accuracy: Plus or minus 1 percent of scale range.
2. Thermowells
 - a. Standard: ASME B40.200.
 - b. Description: Pressure-tight, socket-type fitting made for insertion into piping tee fitting.
 - c. Material for Use with Copper Tubing: CNR or CUNI.
 - d. Material for Use with Steel Piping: CRES.
 - e. Type: Stepped shank unless straight or tapered shank is indicated.
 - f. External Threads: NPS 1/2, NPS 3/4, or NPS 1, ASME B1.20.1 pipe threads.
 - g. Internal Threads: 1/2, 3/4, and 1 inch, with ASME B1.1 screw threads.
 - h. Bore: Diameter required to match thermometer bulb or stem.
 - i. Insertion Length: Length required to match thermometer bulb or stem.
 - j. Lagging Extension: Include on thermowells for insulated piping and tubing.
 - k. Bushings: For converting size of thermowell's internal screw thread to size of thermometer connection.
 - l. Heat Transfer Medium: Mixture of graphite and glycerin.
- E. Domestic-Water Heater Wall Mounting Stand:
 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Holdrite.
 2. Description: Fabricated steel platform, brackets, and rods or struts for wall mounting, capable of supporting domestic-water heater and water. Corrosion-resistant construction with raised edge and drain outlet not less than NPS 3/4 with ASME B1.20.1 pipe threads or with ASME B1.20.7 garden-hose threads.

PART 3 - EXECUTION

3.01 DOMESTIC-WATER HEATER INSTALLATION

- A. Commercial, Electric, Domestic-Water Heater Mounting: Install commercial, electric, domestic-water heaters on concrete base.
 1. Exception: Omit concrete bases for commercial, electric, domestic-water heaters if installation on stand, bracket, suspended platform, or directly on floor is indicated.
 2. Maintain manufacturer's recommended clearances.
 3. Arrange units so controls and devices that require servicing are accessible.
 4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
 5. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.

6. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 7. Install anchor bolts to elevations required for proper attachment to supported equipment.
 8. Anchor domestic-water heaters to substrate.
 9. Provide hereunder expansion tank sized to accommodate expansion in downstream domestic hot water piping. Refer to section 22 1119 – Domestic Water Piping Specialties.
- B. Install electric, domestic-water heaters level and plumb, according to layout drawings, original design, and referenced standards. Maintain manufacturer's recommended clearances. Arrange units so controls and devices needing service are accessible.
 - C. Install shutoff valves on domestic-water-supply piping to domestic-water heaters and on domestic-hot-water outlet piping.
 - D. Install combination temperature-and-pressure relief valves in top portion of storage tanks. Use relief valves with sensing elements that extend into tanks. Extend commercial-water-heater relief-valve outlet, with drain piping same as domestic-water piping in continuous downward pitch, and discharge by positive air gap onto closest floor drain.
 - E. Install water-heater drain piping as indirect waste to spill by positive air gap into open drains or over floor drains. Install hose-end drain valves at low points in water piping for electric, domestic-water heaters that do not have tank drains.
 - F. Install thermometers on outlet piping of electric, domestic-water heaters.
 - G. Fill electric, domestic-water heaters with water.
 - H. Set temperature controls for storage-tank type water heaters to maintain a temperature of 140 deg F.

3.02 CONNECTIONS

- A. Where installing piping adjacent to electric, domestic-water heaters, allow space for service and maintenance of water heaters. Arrange piping for easy removal of domestic-water heaters.

3.03 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
 1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
 2. Operational Test: After electrical circuitry has been energized, start units to confirm proper operation.
 3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- B. Electric, domestic-water heaters will be considered defective if they do not pass tests and inspections.
- C. Prepare test and inspection reports.

END OF SECTION

SECTION 22 4200
COMMERCIAL PLUMBING FIXTURES

PART 1 - GENERAL

1.01 ACTION SUBMITTALS

- A. Provide submittals for products in this section in accordance with Section 22 05 00 – General Plumbing Provisions. Submittal requirements for products listed herein:
 - 1. Catalog Data

PART 2 - PRODUCTS

2.01 LAVATORIES

- A. Acceptable Manufactures:
 - 1. Lavatories: American Standard, Crane, Kohler, Sloan
 - 2. Faucets: American Standard, Chicago, Sloan, Symmons, T&S Brass
 - 3. Drains: Elkay, Just
 - 4. Supplies and Stops: Chicago, McGuire Mfg. Co.
- B. Lavatories (L-1):
 - 1. Fixture: Wall-mounted white vitreous china lavatory with front overflow, ADA compliant. Basis of design as shown on drawings.
 - 2. Trim: Elkay LK-9 grid strainer with 1-1/4-inch tailpiece, chrome plated.
 - 3. Faucet: Centerset chrome-plated single lever brass faucet. ADA compliant. Basis of design as shown on drawings.
 - a. Thermostatic mixing valve: Provided hereunder. See Section 22 11 19 - Domestic Water Piping Specialties.
 - 4. Supplies and Stops: Angle valve with integral spring check and loose key handle. ½-inch I.P.S. female inlet, 3/8-inch O.D. flexible tubing. Wall flange, polished chrome plated finish.

2.02 SINKS

- A. Acceptable Manufacturers:
 - 1. Fixtures: Elkay, Just
 - 2. Faucets: American Standard, Chicago, Moen, Sloan, Symmons, T&S Brass and Bronze Works
 - 3. Drains: Elkay, Just
 - 4. Hot and Cold Water Dispenser: Franke, InSinkErator, Ready Hot.
 - 5. Garbage Disposals: InSinkErator, Kitchen Aid, Waste King.
 - 6. Supplies and Stops: Chicago, McGuire Mfg. Co.
- B. Sinks (S-1):
 - 1. Fixture: 304 stainless-steel, single compartment, undermounted, 18-gauge, undercoated. Basis of design as shown on drawings.
 - 2. Trim: Stainless steel stamped drain outlet with 1-1/2-inch chrome plated brass tailpiece and crumbcatcher.
 - 3. Faucet: Chrome-plated brass, high arc, single lever brass, ADA compliant faucet with pull-out sprayer head. Basis of design as shown on drawings.
 - a. Thermostatic mixing valve: Provided hereunder. See Section 22 11 19 - Domestic Water Piping Specialties.
 - 4. Supplies and Stops: Angle valve with integral spring check and loose key handle. ½-inch I.P.S. female inlet, 3/8-inch O.D. flexible tubing. Wall flange, polished chrome plated finish.
- C. Sinks (S-2)
 - 1. Fixture: 304 stainless-steel, single compartment, undermounted, 18-gauge, undercoated. Basis of design as shown on drawings.
 - 2. Trim: Stainless steel stamped drain outlet with crumbcatcher, connected to garbage disposal.

3. Faucet: Chrome-plated brass, high arc, single lever brass, ADA compliant faucet with pull-out sprayer head. Basis of design as shown on drawings.
 - a. Thermostatic mixing valve: Provided hereunder. See Section 22 11 19 - Domestic Water Piping Specialties.
4. Hot and Cold Water Dispenser: Counter-mounted hot and cold water dispenser with chrome finish, gooseneck spout, separate hot and cold water control handles, 2/3-gallon hot water tank. Filtration cartridge by dispenser manufacturer.
5. Garbage Disposal: Three-stage grinder with sound reducing baffles, permanently lubricated upper and lower bearings, anti-vibration mountings, stainless-steel grinding chamber and components, jam-sensing circuit, manual overload reset.
6. Supplies and Stops: Angle valve with integral spring check and loose key handle. ½-inch I.P.S. female inlet, 3/8-inch O.D. flexible tubing. Wall flange, polished chrome plated finish.

2.03 SHOWERS (SH-1)

- A. Acceptable Manufacturers:
 1. Shower Head: Acorn, Bradley, Powers, Symmons
 2. Enclosure: FiberFab, Willoughby Industries, or approved equal
 3. Base: American Standard, Willoughby Industries.
- B. Shower: Pressure balancing mixing valve with adjustable stop screw, dual check, metal level handle, 36-inch grab bar for hand shower mounting, 60-inch flexible metal hose, hand shower wand, in-line vacuum breaker, ADA compliant, chrome plated. Basis of design as shown on drawings.
- C. Enclosure: White, solid-surface panels with inside corner coves, ADA compliant. Basis of design as shown on drawings.
 1. Accessories: Stainless steel grab bars and fold down seat.
- D. Base: White, solid surface, 36 x 36 transfer shower base with integral rear trench drain, drain hole in rear center, slotted grate, ADA compliant. Basis of design as shown on drawings.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Accurately plumb, horizontal and in-line. Exposed top or globe valve accessibly located when building is completed; locate behind or below fixture served; otherwise in branch piping as approved. Cast brass or 17-gauge fixture traps with cleanout plugs.
- B. Drains: Examine floor rough-in to receive drain for unevenness, irregularities and incorrect dimensions that would affect quality and execution of installation. Do not install until rough-in is sufficient for proper installation. Coordinate installation of drain with other trades to insure watertight seal.
- C. Thermostatic Mixing valves: Provide for fixtures where indicated. Install in accordance with manufacturer's instructions.

3.02 FINISH

- A. Exposed metal parts and piping and under counters, polished chromium plated, unless otherwise specified. Baked white enamel escutcheons at ceilings, chrome plated at walls and floors.

3.03 PROTECTION

- A. Fixture damaged during construction replaced with new and perfect fixtures without expense to Owner. Protect fixture and trim finish during construction with suitable covering.

3.04 MOUNTING HEIGHT

- A. As shown on Drawings or as recommended by manufacturer.

3.05 ELECTRICAL POWER CONNECTIONS

- A. Connect field electrical power source to each separate electrical device requiring field electrical power. Coordinate termination point and connection type with Installer.
- B. Provide low-voltage wiring and metal raceways or conduits between transformers and sensor-actuated fixtures.

- C. Wiring Method: Comply with requirements in Sections 260519 – Low-Voltage Electrical Power Conductors and Cables and 260533 – Raceways and Boxes for Electrical Systems.

END OF SECTION

SECTION 23 0500
GENERAL HVAC PROVISIONS

PART 1 - GENERAL

1.01 CONTRACT DOCUMENTS

- A. General HVAC provisions apply to all work performed in Division 23.
- B. The Contract Documents are complementary. What is required by any one, as affects this Division, shall be as binding as if repeated herein.
- C. Separation of this Division from other Contract Documents shall not be construed as segregation of the Work.
- D. Location of equipment on Drawings is approximate. Plan exact location with respect to site measurements and work of other trades prior to starting work. If measurements differ slightly, modify work. If measurements differ substantially, notify Architect/Engineer and Owner's Authorized Representative prior to fabrication.
- E. Make minor changes in equipment connections and equipment locations as directed or required before rough-in without extra cost.
- F. For products specified by listing one or more manufacturers, followed by "Similar to" and one manufacturer's model number, the following requirements apply:
 - 1. Approval of each listed manufacturer is contingent upon that manufacturer having a product which meets the specification, fits in the available space, and is comparable to the listed model.
 - 2. Electrical requirements, duct requirements and space requirements indicated on drawings are based on the listed model and may not be suitable for all manufacturers listed. Provide revisions required to accommodate the model actually furnished.
- G. For product specified by listing one or more manufacturers, followed by a model number for each manufacturer, the following requirements apply:
 - 1. Provide one of the listed model numbers or an approved substitution.
 - 2. Electrical requirements, duct connections and space requirements indicated on the Drawings are based on one of the listed models and may not be suitable for all models listed. Provide revisions required to accommodate the model actually furnished.

1.02 DEFINITIONS

- A. Authority Having Jurisdiction (AHJ): A federal, state, local, or other regional department or individual such as a fire chief; fire marshal; chief of a fire prevention bureau, labor department, or health department; building official; electrical inspector; or others having statutory authority.
- B. Owner's Authorized Representative (OAR): Owner's representative with authority to act on Owner's behalf.
- C. Architect/Engineer: The design professional leading the design team and can be either an architect or engineer.
- D. The words furnish, install and provide are defined as follows:
 - 1. Furnish: To supply and deliver to the project ready for installation and in operable condition.
 - 2. Install: To place in final position, complete, anchored, connected in operable condition.
 - 3. Provide: To furnish and install complete. Includes the supply of specified services.
 - 4. When neither furnish, install or provide is stated, provided is implied.

1.03 COORDINATION

- A. Check drawings of other trades to avert possible installation conflicts. Should major changes from original drawings be necessary to resolve such conflicts, notify Architect/Engineer and secure written approval and agreement on necessary adjustments before start of work.
- B. Architectural drawings govern all other drawings. Consult in detail the door swings, counter heights and similar items affecting work before rough-in.

- C. Coordinate identification systems with other trades. All mechanical systems shall use identical equipment identification and regulatory signage.

1.04 SUBMITTALS AND SHOP DRAWINGS

- A. See Division 01.
- B. Action Submittal Content
 - 1. Action submittal information not expressly required by the specifications will not be reviewed.
 - 2. Action submittal information shall be provided in sufficient detail to establish conformance with specified requirements. Where submitted literature includes multiple models, features, or options, the specific models, features, or options proposed shall be clearly indicated. Where a brief inspection shows that product data is not complete, the submittal will be rejected without review.
 - 3. Action submittal data shall be clear, concise, legible, and relevant. Where data is not properly organized and contains significant information that is not relevant, the submittal will be rejected without review.
 - 4. Action submittal requirements are listed in individual specification sections. The following definitions apply.
 - a. Materials List: Provide tabular list of materials including specification reference, specification product name, manufacturer, model/part number, and size and/or quantity where appropriate. Do not include supplemental data, except where specifically requested.
 - b. Catalog data: Manufacturer's standard product cut sheet.
 - c. Product Data: Detailed data including dimensions, weight, materials of construction, connections, and all other information needed to confirm that the product conforms to all requirements listed in the individual specification section.
 - d. Performance Data: Capacity, input, output, flow, etc. as required to confirm that the product meets the performance requirements scheduled in the Specifications or on the Drawings.
 - e. Wiring Diagrams: Power and control wiring diagrams.
 - f. Shop Drawings: Construction drawings of items manufactured specifically for this project including dimensions, construction details, weights, and additional information to identify the physical features of the system or piece of equipment.
 - g. Installation Instructions
 - h. Special Requirements Listed: Additional requirements indicated in individual specification sections.
- C. Delegated Design
 - 1. The Contractor shall provide delegated design services where indicated in the Contract Documents and obtain necessary approval from the AHJ. The Contractor shall be responsible for the design, calculations, submittals, permits, fabrication, transportation and installation of these Delegated Design components. The Contractor is responsible to submit all Delegated Design documents required for approvals by regulatory agencies for each item of delegated design work.
 - 2. Delegated design work shall be performed by a registered professional engineer or architect specializing in the associated work and registered in the State in which the work is performed where required by the AHJ or as specified herein.
 - 3. Comply with requirements of the AHJ over the Work current at the time of submission. The Contractor is responsible to coordinate and submit all material required by the AHJ so review and process of submittals and permits will not adversely affect the construction schedule. Each Delegated Design item requiring review by the AHJ must be provided by the Contractor and all fees and costs associated therewith shall be the Contractor's responsibility at no additional cost to the Owner.
 - 4. 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.

- a. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Engineer.
5. Delegated-Design Services Certification: In addition to shop drawings, product data, and other required submittals, submit digitally signed PDF electronic file, 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.
 - a. 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.

1.05 QUALITY ASSURANCE

- A. All materials and equipment provided hereunder shall be installed and started in complete conformance with the manufacturer's recommendations.
- B. Asbestos products or equipment or materials containing asbestos shall not be used.
- C. Certify that each welder has passed the American Welding Society (AWS) qualification tests for the welding processes involved, and that certification is current.

1.06 DESIGN REQUIREMENTS

- A. Equipment and systems provided hereunder shall be rated to provide performance specified and scheduled on Drawings at the elevation of the project site.
- B. Materials and equipment provided hereunder shall be rated for the service conditions of the system to which they are connected including but not limited to temperature, pressure, and humidity.

1.07 CODES AND STANDARDS

- A. Applicable codes and standards shall determine minimum requirements for materials, methods, and labor practices not otherwise stated herein.
- B. Work shall comply with the Americans with Disabilities Act (ADA).

1.08 SEQUENCING

- A. Testing, adjusting, and balancing of HVAC systems will begin after commissioning construction checks and equipment start-up are complete and Systems Ready to Balance Checklist forms have been executed and submitted.
- B. Submit schedule for operator training four weeks prior to Substantial Completion. Schedule shall include time and duration of each required training session.
- C. Submit control verification reports three weeks after Substantial Completion.
- D. Submit draft operations and maintenance manuals to Owner's Authorized Representative 30 days prior to substantial completion.
- E. Operator training shall be performed prior to Substantial Completion, or as otherwise approved by the Owner's Authorized Representative.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store products in a clean and dry place.
- B. Comply with manufacturer's written rigging and installation instructions for unloading and moving to final installed location.
- C. Handle products carefully to prevent damage, breaking, denting, and scoring. Do not install damaged products.
- D. Protect products from weather, dirt, dust, water, construction debris, and physical damage.
- E. Retain factory-applied coverings on equipment to protect finishes during construction and remove just prior to operating unit.

- F. Cover unit openings before installation to prevent dirt and dust from entering inside of units. If required to remove coverings during unit installation, reapply coverings over openings after unit installation and remove just prior to operating unit.
- G. Replace installed products damaged during construction.

1.10 TEMPORARY SERVICES

- A. Provide in accordance with Division 01 as required for completion of work.
- B. Maintain existing systems operational. Owner will be responsible to operate and maintain existing equipment during the course of the project. However, any damage to existing equipment resulting directly from work under this Contract shall be repaired by the Contractor at no expense to Owner.

1.11 OPERATIONS AND MAINTENANCE MANUALS

- A. Furnish operation and maintenance data for project, as described herein.
- B. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF files.
 - 1. Include a directory of all subcontractors and maintenance contractors with names, addresses, and telephone numbers, indicating the area of responsibility for each.
 - 2. 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.
 - 3. Provide a composite summary table indicating each item of equipment listed in the operations and maintenance manual and its required maintenance and time period. This summary table shall be the first section in the O&M manual.
 - 4. Manual Content: Manuals shall contain complete information for each item of mechanical, electrical or other operating equipment. Include as applicable:
 - a. Manufacturer's instructions for installation, startup, operation, inspection, and maintenance
 - b. Lubrication schedules
 - c. Performance capacity
 - d. Final approved product submittals for each product included in project.
 - 1) Mark the model actually provided where the literature covers more than one model. Include all submittal data corrected to "as-built" conditions within the manual.
 - 2) Parts list
 - e. Maintenance schedules
 - f. Maintenance instructions shall indicate routine-type work with step-by-step instructions that should be performed to ensure long life and proper operations. Recommended frequency of performance shall also be included.
 - 5. File Names and Bookmarks: Bookmark 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.
 - 6. Provide electronic configuration files for all packaged equipment control systems furnished with equipment.

1.12 RECORD DRAWINGS

- A. Provide record "as-built" drawings in accordance with Division 01 requirements. Show all deviations from contract drawings and location of underground lines by accurate dimensions from building lines. Show depth of all stub outs and underground lines. Alternately, provide electronically using .pdf markup of contract drawings.

PART 2 - PRODUCTS

2.01 PRODUCTS AND MATERIALS

- A. All materials employed in permanent construction shall be new, full weight, in first class condition, and suitable for space provided. All similar equipment and materials shall be of one manufacturer. The following paragraph is an OSU requirement. Some Owners may have similar requirements but must comply with specific programs, such as "Buy America." Edit as appropriate for the project, delete for projects where it does not apply.
- B. Materials and equipment used as the basis of design is scheduled on Drawings or designated in product specifications. If Contractor chooses to use products that is not the basis of design, Contractor is responsible for all re-design and construction costs associated with variations in arrangement, dimension, or capacity. Such work may include, but is not limited to, changes to facility structure or dimensions and revisions to associated mechanical and electrical systems needed to provide equal system performance and maintainability.

2.02 ELECTRICAL EQUIPMENT

- A. Electrical Disconnect Switch: Electrical disconnect switches specified for mechanical equipment shall conform to OSHA Lock-out/Tag-out requirements.
- B. All electrical equipment shall be listed as approved for its application by the Underwriters Laboratory or other testing agency approved by the State of Oregon Electrical and Elevator Board. Approval indicates agency meets testing standard requirements for electrical safety required by Oregon Revised Statutes 479.510 through 479.855 and Oregon Administrative Rules.
- C. Enclosure: Provide the following electrical equipment enclosure types.
 - 1. NEMA 1: Dry, enclosed locations where the ambient temperature will not be outside of the VFD temperature ratings.
 - 2. NEMA 3R, 4, or 4X with Temperature Control: Outdoors or in unconditioned spaces where ambient temperatures will be outside of the VFD temperature ratings.
 - 3. Enclosure will be provided with a ventilation fan and heater capable of maintaining enclosure temperature within the manufacturer's recommended range. Drive and enclosure shall be a single, UL-listed assembly with single point electrical connections.

2.03 ROOF CURBS, BASES, AND RAILS WITHOUT INTEGRAL VIBRATION ISOLATION

- A. Acceptable Manufacturer: Greenheck, The Pate Company, Thybar.
- B. Related Sections: See Section 23 0548 – Vibration and Seismic Control for curbs or bases that include integral vibration isolation.
- C. Roof equipment curbs, bases and rails shall be provided by supplier of associated equipment and conform to the following requirements and to requirements shown on Drawings:
 - 1. General:
 - a. Submittals: Provide curb, base, and rail submittals as part of associated rooftop equipment submittal packages.
 - b. Seismic and Wind Load: Design curbs, bases, and rails to withstand seismic and wind load forces on equipment in accordance with performance requirements listed in Division 23. Provide attachments including
 - 1) Equipment to curb, base, or rail.
 - 2) Curb, base, or rail to building structure.
 - c. Provide design calculations verifying that seismic and wind load restraint will comply with the Oregon Structural Specialty Code for the site and the building type listed. Drawings, details, and calculations related to seismic and wind load design shall be signed and sealed by an engineer specializing in the associated work and registered in Oregon.
 - 2. Coordination: Coordinate configuration and height of curb with roofing contractor.
 - a. Provide sloped curbs to match roof conditions.
 - b. Curbs shall be provided with cants compatible with roofing system and roofing insulation thickness in accordance with roofing manufacturer's recommendations.

- c. Provide wood nailers where required.
 - d. Provide 16-inch curbs, except as otherwise specified or shown on Drawings. Adjust curb height for roof insulation thickness. Exposed curb height above insulation shall be not less than twelve inches.
3. Curbs
- a. Base: Constructed of G90 galvanized steel framing. Design internal framing to accommodate ductwork, air plenums and conduit as shown on Drawings. Components shall be non-combustible.
 - b. Insulation: Factory or field applied closed-cell insulation with a minimum R-value of R-4.
 - c. Furnish curb with integral crickets if required by roof installation.

2.04 SPECIAL TOOLS AND LUBRICANTS

- A. Furnish and turn over to Owner's Authorized Representative, special tools not readily available commercially, that are required for disassembly or adjustment of equipment and machinery furnished.
- B. Grease Guns with Attachments for Applicable Fittings: Provide one for each type of grease required for motor or other equipment.
- C. Lubricants: Provide a minimum of one quart of oil, and one pound of grease, of equipment manufacturer's recommended grade and type, in unopened containers and properly identified as to use for each different application.

PART 3 - EXECUTION

3.01 ACCESS TO EQUIPMENT AND ACCESSORIES

- A. Install equipment with sufficient access for service. Where not conveniently accessible by other means, provide adequately sized access doors for valves, dampers, motors, belts, and all other mechanical equipment requiring access for removal or maintenance. Type, size and exact location of access doors shall be coordinated with Architect/Engineer prior to work.
- B. Provide clearances for maintenance access as indicated on Drawings or as recommended by manufacturer. If access requirements shown on Drawings conflict with manufacturer's recommendations, provide larger clearance of the two.
- C. If equipment location shown on Drawings does not allow required access, notify Architect/Engineer prior to start of work.
- D. Apply and install all items in accordance with manufacturer's written instructions. Refer conflicts between the manufacturer's instructions and the contract drawings and specifications to Architect/Engineer for resolution prior to starting work.
- E. Provide access doors as required for access to mechanical equipment. Doors required for access are not necessarily shown on Drawings. Consult with Architect/Engineer for direction on placement of required doors not shown on Drawings.
 - 1. Comply with manufacturer's instructions for installation of access doors. Provide all necessary support and supplemental framing for assembly where the access doors are required. Set accurately in position, plumb, level, and flush to adjacent finish surfaces; and secure to support.
- F. Where ladder access is required to service elevated components, provide an installation that provides for sufficient access within ladder manufacturer's written instructions for use.
- G. Comply with OSHA regulations.

3.02 ARRANGEMENT AND INSTALLATION OF EQUIPMENT

- A. Coordinate location of hangers, ductwork and equipment. Locate hangers, ductwork and equipment clear of windows, doors, openings, lights, electrical outlets, and other services and utilities. Follow manufacturer's published recommendations for installation methods not otherwise specified.

- B. Equipment Support: Coordinate structural systems necessary for equipment support with equipment locations to permit proper installation.
- C. Interconnection of Controls and Instruments: Generally not shown but must be provided. This includes interconnections of sensors, transmitters, transducers, control devices, control and instrumentation panels, instruments, and computer workstations. Comply with NFPA-70.
- D. Work in Existing Building: Cut required openings through existing masonry and reinforced concrete using diamond core drills. Use of pneumatic hammer type drills, impact type electric drills, and hand or manual hammer type drills, will be permitted only with approval of the Owner's Authorized Representative. Locate openings that will least affect structural slabs, columns, ribs, or beams. Refer to the Architect/Engineer for determination of proper design for openings through structural sections and obtain layout approval prior to cutting or drilling into structure. After Architect/Engineer approval, carefully cut opening through construction no larger than absolutely necessary for the required installation.
- E. Inaccessible Equipment
 - 1. Where the Owner's Authorized Representative determines that the Contractor has installed equipment not conveniently accessible for operation and maintenance, equipment shall be removed and reinstalled or remedial action performed as directed at no additional cost to the Owner.
 - 2. The term "conveniently accessible" is defined as capable of being reached without the use of ladders, or without climbing or crawling under or over obstacles such as motors, fans, pumps, belt guards, transformers, high voltage lines and ductwork.

3.03 EXISTING EQUIPMENT REUSED OR RELOCATED

- A. All equipment designated as existing or furnished by Owner shall be cleaned and repaired before reinstallation. Any items requiring repair shall be brought to the attention of the construction manager before the item is reinstalled. Damage not brought to the attention of the construction manager shall be deemed the result of reinstallation of the item and shall be repaired without expense to the Owner.

3.04 MECHANICAL SYSTEMS FIRESTOPPING

- A. Do not cover firestop installations until they are examined by the Authority Having Jurisdiction, if required.
- B. Install firestopping in accordance with manufacturer's recommendations and conditions of product UL listing.

3.05 ROOF CURBS, BASES, AND RAILS WITHOUT INTEGRAL VIBRATION ISOLATION

- A. Curb, Base, Rail Support, Field Built-Up: Install roof curbs, level and secure, according to details on Drawings. Install and secure equipment, and coordinate roof penetrations and flashing with roof construction.

3.06 LUBRICATION

- A. Lubricate all devices requiring lubrication prior to initial operation. Field check all devices for proper lubrication.
- B. Equip all devices with required lubrication fittings or devices.
- C. All lubrication points shall be accessible without disassembling equipment, except to remove access panels.

3.07 CLEANING SYSTEMS

- A. General: After all equipment and duct systems are installed, system shall be thoroughly cleaned. Remove all stickers and tags from equipment or fixtures.
- B. Air Distribution Duct System:
 - 1. Remove all debris from system before operation. Under no circumstances shall system be operated without filters. Replace filters used during construction with new filters.
 - 2. Repair or replace any discolorations or damage to system, building finish, or furnishings resulting from Contractor's failure to properly clean system.

3.08 START UP

- A. The Mechanical Contractor shall be responsible for proper operation of all systems and shall coordinate startup procedures, calibration and system checkout. System operational problems shall be diagnosed and corrected as required for system operation prior to Substantial Completion inspection.
- B. Start equipment in accordance with manufacturer's recommendations and under manufacturer's supervision where required. Ensure that associated filters, strainers, electrical overloads, and other devices intended to protect the equipment are installed and functional prior to startup.
- C. The Mechanical Contractor shall perform TAB system-readiness checks of HVAC systems and equipment to verify system readiness for TAB work. TAB system-readiness checklists will be provided by the TAB Specialist. See Section 23 0593 - Testing, Adjusting, and Balancing for HVAC.

3.09 DEMONSTRATION

- A. General: After installation is complete, demonstrate to Engineer and Owner's Authorized Representative satisfaction as being complete and operational and entirely in conformance with Contract Documents.
- B. Preparation: Prior to demonstration, submit check-off list indicating completeness of submittals and certificates of compliance for review to Owner's Authorized Representative. Operate completed system for one week. Verify that control verification is complete and verification report has been approved by Architect/Engineer.
- C. Arrange for demonstration with Owner's Authorized Representative, Engineer, required factory technicians, and installer at least one week in advance of demonstration.

3.10 TRAINING

- A. Instruct Owner in proper operation and maintenance of equipment and systems. Instruction shall generally include topics listed in manufacturer's operations and maintenance manual. Operator instructions shall cover all aspects of manual, automatic, and safety controls. Contractor shall also instruct the Owner in the general configuration of systems and location of equipment and components.
- B. Furnish competent qualified technicians knowledgeable in the building HVAC systems and equipment provided for this project for a minimum of 4 hours on-site to instruct Owner in operation and maintenance of systems and equipment. This figure does not include additional training noted under individual specification sections. Contractor shall keep a log of this instruction including date, times, subjects, and those present and shall present such log when requested by Engineer. Contractor shall coordinate training with Owner's Project Manager and provide a schedule for training minimum two-weeks prior to Substantial Completion. All training shall be complete 30-days after Substantial Completion.
- C. Contractor shall furnish training by equipment manufacturers in addition to training described in this section where specifically listed in other sections. Contractor shall schedule training with Owner's Project Manager minimum 48-hours prior to training session. Equipment shall be fully operational prior to scheduling training session. Manufacturer's field start-up, adjustment, and service will not fulfill manufacturer's training requirement.
- D. Contractor shall coordinate operator training with the Owner's Authorized Representative as follows:
 - 1. Training Schedule: Contractor shall develop and submit a training schedule listing all required training including contractor training, manufacturer training, and factory training as specified for approval by the Owner's Authorized Representative.

2. Training Record and Evaluation Section: Contractor shall maintain a Training Record documenting attendees and duration of each training session. The Contractor shall complete Training Record after each training session. Submit training record when all training is complete.

END OF SECTION

SECTION 23 0593
TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Balancing air systems and equipment.
 - 2. Testing, adjusting, and balancing existing systems and equipment.
 - 3. Control system measurement and verification.

1.02 DEFINITIONS

- A. AABC: Associated Air Balance Council.
- B. BAS: Building automation systems.
- C. NEBB: National Environmental Balancing Bureau.
- D. TAB Specialist: An independent entity meeting qualification to perform TAB work.
- E. TAB Project Supervisor: Certified individual employed by balancing contractor having administrative and technical responsibility for work performed under this Section.
- F. TAB: Testing, adjusting, and balancing.

1.03 PREINSTALLATION MEETINGS

- A. TAB Conference: Conduct a TAB conference after approval of the TAB strategies and procedures plan to develop a mutual understanding of the details and procedures. Provide a minimum of 14 days' advance notice of scheduled meeting time and location.
 - 1. Minimum Agenda Items:
 - a. Existing Conditions Report.
 - b. Contract Documents Examination Report.
 - c. Strategies and Procedures Plan.
 - d. Coordination and assistance of trades and subcontractors to support TAB work.
 - e. System-readiness checks.
 - f. Construction schedule allowances for TAB work.
 - g. TAB reports and resolution of issues identified.

1.04 INFORMATIONAL SUBMITTALS

- A. Qualification Data: Within 15 days of Contractor's Notice to Proceed, submit documentation that the TAB specialist and this Project's TAB team members meet the qualifications specified in Part 1 "Quality Assurance" and Part 3 "TAB Specialist."
- B. Pre-construction TAB Reports:
 - 1. Existing Conditions TAB Report: Within 30 days of Contractor's Notice to Proceed, submit the as specified in Part 3 "Procedures for Testing, Adjusting, and Balancing Existing Systems."
 - 2. Contract Documents Examination Report: Within 60 days of Contractor's Notice to Proceed, submit the Contract Documents review report as specified in Part 3 "Examination."
- C. Strategies and Procedures Plan: Within 60 days of Contractor's Notice to Proceed, submit TAB strategies and step-by-step procedures as specified in "Preparation" Article.
- D. System Readiness Checklists: Within 60 days of Contractor's Notice to Proceed, submit system readiness checklists as specified in "Preparation" Article.
- E. Instrument Calibration Report: Within 60 days of Contractor's Notice to Proceed. Report to include the following:
 - 1. Instrument type and make.
 - 2. Serial number.
 - 3. Application.
 - 4. Dates of use.

- 5. Dates of calibration.
- F. Progress Reports: Submit the as specified in Part 3 "Progress Reporting."
- G. TAB reports.
 - 1. Draft TAB Report
 - 2. Certified Final TAB report.

1.05 QUALITY ASSURANCE

- A. All work under this Section shall be performed under the direction of the Certified TAB Supervisor.
- B. TAB Specialists Qualifications: Certified by AABC or NEBB.
 - 1. TAB Supervisor: Employee of the TAB specialist and certified by AABC or NEBB.
 - 2. TAB Technician: Employee of the TAB specialist working under the supervision of the TAB Supervisor.
- C. Instrumentation Type, Quantity, Accuracy, and Calibration: Comply with requirements in ASHRAE 111, Section 4, "Instrumentation."

1.06 FIELD CONDITIONS

- A. Full Owner Occupancy: Owner will occupy the site and existing building during entire TAB period. Cooperate with Owner during TAB operations to minimize conflicts with Owner's operations.
- B. Partial Owner Occupancy: Owner may occupy completed areas of building before Substantial Completion. Cooperate with Owner during TAB operations to minimize conflicts with Owner's operations.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 TAB SPECIALISTS

- A. Subject to compliance with requirements, engage one of the following:
 - 1. Air Balancing Specialties.
 - 2. Air Introduction and Regulation, Inc.
 - 3. Neudorfer Engineering, Inc.
 - 4. Southern Oregon Engineering Services, Inc.

3.02 EXAMINATION

- A. Contract Document Examination:
 - 1. Examine the Contract Documents to become familiar with Project requirements and to discover conditions in systems designs that may preclude proper TAB of systems and equipment.
 - 2. Confirm that balancing devices and provisions are included to facilitate TAB work. Provide listing of any devices and provisions required that are on included in the Contact Documents.
 - 3. Contract Documents Examination Report: Based on examination of the Contract Documents, prepare a report on the adequacy of design for systems balancing devices. Recommend changes and additions to systems balancing devices to facilitate proper performance measuring and balancing. Recommend changes and additions to HVAC systems and general construction to allow access for performance measuring and balancing devices.
- B. Construction Examination:
 - 1. Examine the approved submittals for HVAC systems and equipment.
 - 2. Examine installed systems for balancing devices, such as manual volume dampers. Verify that locations of these balancing devices are applicable for intended purpose and are accessible.

3. Examine design data including HVAC system descriptions, statements of design assumptions for environmental conditions and systems output, and statements of philosophies and assumptions about HVAC system and equipment controls.
4. Examine system and equipment installations and verify that field quality-control testing, cleaning, and adjusting specified in individual Sections have been performed.
5. Examine test reports specified in individual system and equipment Sections.
6. Examine HVAC equipment and verify that bearings are greased, filters are clean, and equipment with functioning controls is ready for operation.
7. Examine heat-transfer coils for clean and straight fins.
8. Report deficiencies discovered before and during performance of TAB procedures. Observe and record system reactions to changes in conditions. Record default set points if different from indicated values.

3.03 PREPARATION

- A. Strategies and Procedures Plan: Prepare a TAB plan that includes the following:
 1. Equipment and systems to be tested.
 2. Strategies and step-by-step procedures for balancing the systems.
 3. Instrumentation to be used.
 4. Sample forms with specific identification for all equipment.
- B. Prepare system-readiness checks of HVAC systems and equipment to be executed by the Mechanical Contractor to verify system readiness for TAB work. Include, at a minimum, the following:
 1. Airside:
 - a. Verify that leakage and pressure tests on air distribution systems have been satisfactorily completed.
 - b. Duct systems are complete with terminals installed.
 - c. Volume dampers are open and functional.
 - d. Clean filters are installed.
 - e. Fans are operating, free of vibration, and rotating in correct direction.
 - f. Automatic temperature-control systems are operational.
 - g. Ceilings are installed.
 - h. Windows and doors are installed.
 - i. Suitable access to balancing devices and equipment is provided.

3.04 GENERAL PROCEDURES FOR TESTING AND BALANCING

- A. Perform testing and balancing procedures on each system according to the procedures contained in AABC's "National Standards for Total System Balance" or NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems" and in this Section.
 1. Comply with requirements in ASHRAE 62.1, "Air Balancing."
- B. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary for TAB procedures.
 1. After testing and balancing, install test ports and duct access doors as required in Section 23 3300 – Air Duct Accessories. Otherwise, patch probe holes in ducts with same material and thickness as used to construct ducts.
 2. Install and join new insulation that matches removed materials. Restore insulation, coverings, vapor barrier, and finish according to Section 23 0713 – Duct Insulation.
- C. Mark equipment and balancing devices, including damper-control positions and similar controls and devices, with paint or other suitable, permanent identification material to show final settings.
- D. Take and report testing and balancing measurements in inch-pound (IP) units.

3.05 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS

- A. Prepare test reports for both fans and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Cross-check the summation of required outlet volumes with required fan volumes.

- B. Prepare schematic diagrams of systems' "as-built" duct layouts.
- C. Determine the best locations in main and branch ducts for accurate duct-airflow measurements.
- D. Check dampers for proper position to achieve desired airflow path.
- E. Check for airflow blockages.
- F. Check condensate drains for proper connections and functioning.
- G. Check for proper sealing of air-handling-unit components.
- H. Verify that air duct system is sealed as specified in Section 23 3113 – Metal Ductwork.
- I. Fan Pressure Measurements:
 - 1. Measure static pressure directly at the fan outlet or through the flexible connection.
 - 2. Measure static pressure directly at the fan inlet or through the flexible connection.
 - 3. Measure static pressure across each component that makes up an air-handling system.
- J. Air Inlets and Outlets:
 - 1. Supply Diffusers: Set airflow patterns of adjustable outlets for proper distribution without drafts.
- K. Control Parameters and Setpoints:
 - 1. Minimum Ventilation Rates: Measure and adjust outside-air, return-air, and relief-air dampers for proper position to achieve minimum outdoor-air conditions. Determine setpoint values for specific control sequences controlling damper operation.
 - 2. Record verification measurement, calibration parameters, and setpoints in Final TAB Report.

3.06 PROCEDURES FOR HEAT-TRANSFER COILS

- A. Measure, adjust, and record the following data for each water coil:
 - 1. Entering- and leaving-water temperature.
 - 2. Water flow rate.
 - 3. Water pressure drop for major (more than 20 gpm) equipment coils, excluding unitary equipment such as reheat coils, unit heaters, and fan-coil units.
 - 4. Dry-bulb temperature of entering and leaving air.
 - 5. Wet-bulb temperature of entering and leaving air for cooling coils.
 - 6. Airflow.
- B. Measure, adjust, and record the following data for each refrigerant coil:
 - 1. Dry-bulb temperature of entering and leaving air.
 - 2. Wet-bulb temperature of entering and leaving air.
 - 3. Airflow.

3.07 CONTROLS VERIFICATION

- A. In conjunction with system balancing, perform the following:
 - 1. Verify location and installation of sensors to ensure that they sense only intended temperature.
 - 2. Verify the operation of damper actuators. Verify that controlled devices travel freely and are in position indicated by controller: open, closed, or modulating.
- B. Reporting: Include a summary of verifications performed, remaining deficiencies, and variations from indicated conditions in Final Report.

3.08 PROCEDURES FOR TESTING, ADJUSTING, AND BALANCING EXISTING SYSTEMS

- A. Perform testing and balancing of existing systems to the extent that existing systems are affected by the renovation work. TAB shall be performed to achieve system performance shown on Drawings and as specified. TAB shall be performed for interrelated equipment and systems which are not otherwise modified, but where testing, adjusting, and balancing is required to achieve overall system performance and to maintain existing equipment and systems that are unmodified operating at preconstruction conditions.
 - 1. Compare the indicated airflow of the renovated work to the measured fan airflows and determine the new fan speed and the face velocity of filters and coils.

2. Verify that the indicated airflows of the renovated work result in filter and coil face velocities and fan speeds that are within the acceptable limits defined by equipment manufacturer.
 3. If calculations increase or decrease the airflow rates by more than 5 percent, make equipment adjustments to achieve the calculated rates. If increase or decrease is 5 percent or less, equipment adjustments are not required.
 4. Balance each air outlet.
- B. Perform preconstruction inspection and measurement operating condition of existing equipment interconnected with new work and will remain and be reused. Preconstruction tests shall be performed within 30 days of the Contractors Notice to Proceed and prior to the beginning of any construction work and other activities that affect the performance of existing systems and equipment. If measurements are not performed as specified, comprehensive testing, adjusting, and balancing shall be performed for all interconnected systems and equipment.
1. Measure and record the operating speed, airflow, and static pressure of each fan.
 2. Measure motor voltage and amperage. Compare the values to motor nameplate information.
 3. Check the refrigerant charge.
 4. Check the condition of filters.
 5. Check the condition of coils.
 6. Check the operation of the drain pan and condensate-drain trap.
 7. Check bearings and other lubricated parts for proper lubrication.
 8. Report on the operating condition of the equipment and the results of the measurements taken. Report deficiencies.
- C. Before performing testing and balancing of existing systems, inspect existing equipment that is to remain and be reused to verify that existing equipment has been cleaned and refurbished. Verify the following:
1. New filters are installed.
 2. Coils are clean and fins combed.
 3. Drain pans are clean.
 4. Fans are clean.
 5. Bearings and other parts are properly lubricated.
 6. Deficiencies noted in the preconstruction report are corrected.
- D. Prepare an Existing Conditions TAB Report documenting inspections and measurements.

3.09 TOLERANCES

- A. Set HVAC system's airflow rates and water flow rates within the following tolerances:
1. Supply, Return, and Exhaust Fans and Equipment with Fans: Plus 10 percent or minus 5 percent.
 2. Air Outlets and Inlets: Plus or minus 10 percent.
- B. Maintaining pressure relationships as designed shall have priority over the tolerances specified above.

3.10 FINAL REPORT

- A. General: Prepare a certified written report; tabulate and divide the report into separate sections for tested systems and balanced systems.
1. Include a certification sheet at the front of the report's binder, signed and sealed by the certified testing and balancing engineer.
 2. Include a list of instruments used for procedures, along with proof of calibration.
 3. Certify validity and accuracy of field data.
- B. Final Report Contents: In addition to certified field-report data, include the following:
1. Fan curves.
 2. Manufacturers' test data.
 3. Field test reports prepared by system and equipment installers. Test reports shall be fully executed reports forms confirming to standard NEBB or AABC documentation standards.

4. Other information relative to equipment performance; do not include Shop Drawings and Product Data.
- C. General Report Data: In addition to form titles and entries, include the following data:
1. Title page.
 2. Name and address of the TAB specialist.
 3. Project name.
 4. Project location.
 5. Architect's name and address.
 6. Engineer's name and address.
 7. Contractor's name and address.
 8. Report date.
 9. Signature of TAB supervisor who certifies the report.
 10. Table of Contents with the total number of pages defined for each section of the report. Number each page in the report.
 11. Summary of contents including the following:
 - a. Indicated versus final performance.
 - b. Notable characteristics of systems.
 - c. Description of system operation sequence if it varies from the Contract Documents.
 12. Nomenclature sheets for each item of equipment.
 13. Notes to explain why certain final data in the body of reports vary from indicated values.
 14. Test conditions for fans and pump performance forms including the following:
 - a. Settings for outdoor-, return-, and exhaust-air dampers.
 - b. Conditions of filters.
 - c. Cooling coil, wet- and dry-bulb conditions.
 - d. Other system operating conditions that affect performance.
- D. System Diagrams: Include schematic layouts of air and hydronic distribution systems. Present each system with single-line diagram and include the following:
1. Quantities of outdoor, supply, return, and exhaust airflows.
 2. Duct, outlet, and inlet sizes.
 3. Position of balancing devices.
- E. Instrument Calibration Reports:
1. Report Data:
 - a. Instrument type and make.
 - b. Serial number.
 - c. Application.
 - d. Dates of use.
 - e. Dates of calibration.

3.11 ADDITIONAL TESTS

- A. Within 90 days of completing TAB, perform additional TAB to verify that balanced conditions are being maintained throughout and to correct unusual conditions.
- B. Seasonal Periods: If initial TAB procedures were not performed during near-peak summer and winter conditions, perform additional TAB during near-peak summer and winter conditions. Prepare Seasonal Test Report of measurements and adjustments.

END OF SECTION

**SECTION 23 0713
DUCT INSULATION**

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes insulation of HVAC ductwork.

1.02 ACTION SUBMITTALS

- A. Provide submittals in accordance with Section 23 0500 – General HVAC Provisions as follows:
 - 1. Provide catalog data for all products. Indicate thermal conductivity, water vapor permeance, and jackets (both factory and field applied) if any.

1.03 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.04 QUALITY ASSURANCE

- A. Insulation materials and accessories shall be installed in a professional manner by skilled and experienced workers who specialize in commercial insulation work.
- B. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84, by a testing agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.
 - 1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.06 COORDINATION

- A. Coordinate clearance requirements with duct Installer for duct insulation application. Before preparing ductwork Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.

1.07 SCHEDULING

- A. If duct leak testing is required, schedule insulation application after systems are tested and, where required. Insulation application may begin on segments that have satisfactory test results.
- B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.01 INSULATION MATERIALS

- A. Products shall not contain asbestos, lead, mercury, or mercury compounds.
- B. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.
- C. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.
- D. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.
- E. Insulation jacket material shall be paintable where painting of the insulation jacket is specified.

- F. Mineral-Fiber Blanket Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 553, Type II and ASTM C 1290,. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. CertainTeed Corporation
 - b. Johns Manville, a Berkshire Hathaway company
 - c. Knauf Insulation

2.02 ADHESIVES

- A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated unless otherwise indicated.
- B. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.
- C. FSK Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.

2.03 MASTICS

- A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-PRF-19565C, Type II.
- B. Vapor-Barrier Mastic: Water based; suitable for indoor use on below ambient services.
 1. Water-Vapor Permeance: ASTM E 96/E 96M, Procedure B, 0.013 perm at 43-mil dry film thickness.
 2. Service Temperature Range: Minus 20 to plus 180°F.
 3. Solids Content: ASTM D 1644, 58 percent by volume and 70 percent by weight.
 4. Color: White.

2.04 SEALANTS

- A. FSK and Metal Jacket Flashing Sealants:
 1. Materials shall be compatible with insulation materials, jackets, and substrates.
 2. Fire- and water-resistant, flexible, elastomeric sealant.
 3. Service Temperature Range: Minus 40 to plus 250°F.
 4. Color: Aluminum.

2.05 FACTORY-APPLIED JACKETS

- A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:
 1. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with Kraft paper backing; complying with ASTM C 1136, Type II.

2.06 FIELD-APPLIED JACKETS

- A. Field-applied jackets shall comply with ASTM C 921, Type I, unless otherwise indicated.

2.07 TAPES

- A. FSK Tape: Foil-face, vapor-retarder tape matching factory-applied jacket with acrylic adhesive; complying with ASTM C 1136.
 1. Width: 3 inches.
 2. Thickness: 6.5 mils.
 3. Adhesion: 90 ounces force/inch in width.
 4. Elongation: 2 percent.
 5. Tensile Strength: 40 lbf/inch in width.
 6. FSK Tape Disks and Squares: Precut disks or squares of FSK tape.

2.08 SECUREMENTS

- A. Insulation Pins and Hangers:
 1. Capacitor-Discharge-Weld Pins: Copper- or zinc-coated steel pin, fully annealed for capacitor-discharge welding, 0.106-inch- diameter shank, length to suit depth of insulation indicated.

2. Cupped-Head, Capacitor-Discharge-Weld Pins: Copper- or zinc-coated steel pin, fully annealed for capacitor-discharge welding, 0.106-inch- diameter shank, length to suit depth of insulation indicated with integral 1-1/2-inch galvanized carbon-steel washer.
3. Metal, Adhesively Attached, Perforated-Base Insulation Hangers: Baseplate welded to projecting spindle that is capable of holding insulation, of thickness indicated, securely in position indicated when self-locking washer is in place. Comply with the following requirements:
 - a. Baseplate: Perforated, galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.
 - b. Spindle: Copper- or zinc-coated, low-carbon steel, fully annealed, 0.106-inch-diameter shank, length to suit depth of insulation indicated.
 - c. Adhesive: Recommended by hanger manufacturer. Product with demonstrated capability to bond insulation hanger securely to substrates indicated without damaging insulation, hangers, and substrates.
4. Self-Sticking-Base Insulation Hangers: Baseplate welded to projecting spindle that is capable of holding insulation, of thickness indicated, securely in position indicated when self-locking washer is in place. Comply with the following requirements:
 - a. Baseplate: Galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.
 - b. Spindle: Copper- or zinc-coated, low-carbon steel, fully annealed, 0.106-inch-diameter shank, length to suit depth of insulation indicated.
 - c. Adhesive-backed base with a peel-off protective cover.
5. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch- thick, galvanized-steel or aluminum sheet, with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches in diameter.
 - a. Protect ends with capped self-locking washers incorporating a spring steel insert to ensure permanent retention of cap in exposed locations.
6. Nonmetal Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch-thick nylon sheet, with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches in diameter.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.
 1. Verify that systems to be insulated have been tested and are free of defects.
 2. Verify that surfaces to be insulated are clean and dry.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

3.03 GENERAL INSTALLATION REQUIREMENTS

- A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces, free of voids throughout the length of ducts and fittings.
- B. Install insulation materials, vapor barriers or retarders, jackets, and thicknesses required for each item of duct system as specified in insulation system schedules.
- C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.
- D. Install insulation with longitudinal seams at top and bottom of horizontal runs.
- E. Keep insulation materials dry during application and finishing.
- F. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

- G. Install insulation with least number of joints practical.
- H. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
 - 1. Install insulation continuously through hangers and around anchor attachments.
 - 2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
 - 3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
- I. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.
- J. Install insulation with factory-applied jackets as follows:
 - 1. Draw jacket tight and smooth.
 - 2. Cover circumferential joints with 3-inch- wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.
 - 3. Overlap jacket longitudinal seams at least 1-1/2 inches. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge.
 - a. For below ambient services, apply vapor-barrier mastic over staples.
 - 4. Cover joints and seams with tape, according to insulation material manufacturer's written instructions, to maintain vapor seal.
 - 5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to duct flanges and fittings.
- K. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.
- L. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.
- M. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

3.04 INSTALLATION OF MINERAL-FIBER INSULATION

- A. Blanket Insulation Installation on Ducts and Plenums: Secure with adhesive and insulation pins.
 - 1. Apply adhesives according to manufacturer's recommended coverage rates per unit area, and manufacturer's recommended percent coverage of duct and plenum surfaces.
 - 2. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions.
 - 3. Install support pins on sides and bottom of horizontal ducts and sides of vertical ducts as follows:
 - a. On duct sides with dimensions 18 inches and smaller, place pins along longitudinal centerline of duct. Space 3 inches maximum from insulation end joints, and 16 inches o.c.
 - b. On duct sides with dimensions larger than 18 inches, place pins 16 inches o.c. each way, and 3 inches maximum from insulation joints. Install additional pins to hold insulation tightly against surface at cross bracing.
 - c. Pins may be omitted from top surface of horizontal, rectangular ducts and plenums.
 - d. Do not over-compress insulation during installation.
 - e. Impale insulation over pins and attach speed washers.
 - f. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.
 - 4. For ducts and plenums with surface temperatures below ambient, install a continuous unbroken vapor barrier. Create a facing lap for longitudinal seams and end joints with

insulation by removing 2 inches from one edge and one end of insulation segment. Secure laps to adjacent insulation section with 1/2-inch outward-clinching staples, 1 inch o.c. Install vapor barrier consisting of factory- or field-applied jacket, adhesive, vapor-barrier mastic, and sealant at joints, seams, and protrusions.

- a. Repair punctures, tears, and penetrations with tape or mastic to maintain vapor-barrier seal.
 - b. Install vapor stops for ductwork and plenums operating below 50°F at 18-foot intervals. Vapor stops shall consist of vapor-barrier mastic applied in a Z-shaped pattern over insulation face, along butt end of insulation, and over the surface. Cover insulation face and surface to be insulated a width equal to two times the insulation thickness, but not less than 3 inches.
5. Install insulation on rectangular duct elbows and transitions with a full insulation section for each surface. Install insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.
 6. Insulate duct stiffeners, hangers, and flanges that protrude beyond insulation surface with 6-inch- wide strips of same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with pins spaced 6 inches o.c.

3.05 FIELD QUALITY CONTROL

- A. Testing Agency: Owner reserves the right to perform tests and inspections.
- B. Tests will include removing field-applied jacket and insulation in layers in reverse order of their installation for each duct system schedule as directed by the Owner.
- C. If sample inspection reveals noncompliance with requirements, all similar insulation applications will be considered defective Work and will be replaced at no expense to the Owner.

3.06 DUCT INSULATION SCHEDULE

- A. Insulate all plenums and ductwork as scheduled with the following exceptions.
 1. Metal ducts with duct liner of sufficient thickness to comply with energy code and ASHRAE/IESNA 90.1.
 2. Factory-insulated flexible ducts.
 3. Factory-insulated plenums and casings.
 4. Flexible connectors.
 5. Vibration-control devices.
 6. Factory-insulated access panels and doors.
- B. Insulate ductwork located indoors in conditioned spaces:
 1. Supply Air.
 - a. Concealed ductwork:
 - 1) Mineral-Fiber Blanket: 2 inches thick and 0.75-lb/cu. ft. nominal density, FSK jacket.

END OF SECTION

**SECTION 23 0922
GENERAL AUTOMATIC CONTROLS FOR HVAC**

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Work hereunder includes control systems and integration of systems and equipment specified in Divisions 22 and 23. Associated work includes but is not limited to:
 1. Communication, control wiring, and power wiring as required
 2. Field mounted devices
 3. Other materials and devices not shown as part of other work but necessary to provide mechanical and electrical system control and monitoring sequences specified.

1.02 PRODUCTS INSTALLED BUT NOT FURNISHED UNDER THIS SECTION

- A. Coordinate with other trades to ensure correct installation and control of products installed but not furnished under this section. Such products include but are not limited to the following:
 1. Thermostats furnished with packaged equipment

1.03 SUBMITTALS

- A. Provide submittals for products listed in the Product Table below in accordance with Section 23 0500 – General HVAC Provisions. Submittal requirements indicated by column number designation as follows:
 1. Materials List
 2. Catalog Data
 3. Product Data
 4. Performance Data
 5. Wiring Diagrams
 6. Shop Drawings
 7. Installation Instructions
 8. Special Requirements listed herein.

PRODUCT TABLE	1	2	3	4	5	6	7	8
All Products This Section								X

- B. Special Requirements:
 1. Submittals prior to starting work:
 - a. Submit in accordance with Division 01 and Section 23 0500 – General HVAC Provisions within 6 weeks of Notice to Proceed.
 - b. When manufacturers’ product information applies to a product series rather than a specific product, the data specifically applicable to the project shall be highlighted or clearly indicated by other means. Each submitted piece of literature and drawings shall clearly reference the pertinent specification or drawing.
 - c. Control Hardware: Provide a complete bill of materials of control system hardware indicating quantity, manufacturer, model number, and technical data. Technical data shall include performance curves, product specifications sheets, and installation/maintenance instructions.
 - d. Controlled Systems:
 - 1) Provide a schematic wiring diagram for each controlled system. Label all elements. Label all terminals.
 - 2) Provide a mounting, wiring, and routing plan-view drawing. Layout to account for HVAC, electrical, and other system design and layout requirements.
 2. Closeout Submittals:
 - a. Submit in accordance with Division 01..
 - b. Record documents shall include the following:
 - 1) Project record drawings. Project record drawings will be as-built versions of the Shop Drawings. Include one set of digital media.

1.04 QUALITY ASSURANCE

- A. All products used in this application, except for those specifically indicated for reuse, shall be new and under current manufacture and shall be the most recent version offered by the manufacturer for the application. Spare parts shall be available from the manufacturer for at least five years after final completion.

1.05 CODES AND STANDARDS

- A. Work, materials, and equipment shall comply with all local, state, and federal codes and ordinances.

PART 2 - PRODUCTS

2.01 POWER SUPPLIES AND LINE FILTERING

- A. Provide UL listed control transformers. Provide class 2 current-limiting type or furnish over-current protection in both primary and secondary circuits in accordance with NEC requirements. Limit connected loads to 80% of rated capacity.

2.02 WIRING AND RACEWAYS

- A. Provide wiring, plenum cable, and raceways in accordance with Division 26.
- B. All insulated wire to have copper conductor. UL labeled for 90°C service.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Integrate new equipment into the existing Trane Tracer Summit control system, providing all points and graphics to match the existing system.

3.02 COORDINATION

- A. Coordinate with controls specified in other sections or divisions. Other sections or divisions include controls and control devices to be part of or interfaced with the control system specified in this section. Integration and coordination with these controls shall be as follows:
 1. All communications media and equipment required to interface with equipment specified in other sections provided hereunder unless specifically stated otherwise.
 2. Each supplier of a control product is responsible for the configuration, programming, start-up, and testing of that product to meet the Sequence of Operation.
 3. Coordinate and resolve any compatibility issues arising between control products provided hereunder and those provided under other sections or divisions.

3.03 WORKMANSHIP

- A. Install all equipment in accordance with manufacturers' recommendations.
- B. Install equipment, piping, and wiring/raceway parallel to building lines wherever possible.
- C. Provide sufficient slack and flexible connections in wiring to allow for vibration of piping and equipment.
- D. Install all equipment in readily accessible locations as defined by Chapter 1, Article 100, Part A of the National Electric Code.

3.04 EXISTING EQUIPMENT

- A. Existing Wiring: Contractor may reuse existing wiring provided the quality of the existing installation meets this specification. Verify the integrity of existing wiring and re-label in accordance with this specification. Remove wiring or tubing abandoned as the result of this work.
- B. Temperature Sensor Wells: Contractor may reuse existing sensor wells in piping. Modify wells as required to provide proper fit of sensors
- C. Room Thermostats or Sensors: Salvage, recondition, and reuse.
- D. Electronic Sensors and Transmitters: Salvage, recondition, and reuse.
- E. Electronic Controllers and Auxiliary Electric Equipment: Salvage, recondition, and reuse.

3.05 GENERAL WIRING

- A. All control and interlock wiring shall comply with national and electrical codes and Division 26. Where requirements of this section differ from those in Division 26, the requirements of this section shall take precedence.
- B. ALL NEC Class 1 (line voltage) wiring shall be UL listed in approved raceway according to NEC and Division 26 requirements.
- C. All low-voltage wiring shall meet NEC Class 2 requirements. Low voltage power circuits shall be sub-fused when required to meet Class 2 limits.
- D. Where NEC Class 2 (current-limited) wires are in concealed and accessible locations, including ceiling plenum and return air plenums, approved cable not in raceway may be used, provided cables are UL listed for the intended application.
- E. All wiring in mechanical, electrical, or service rooms and wiring located where it may be subject to damage shall be installed in raceway.
- F. Do not install Class 2 wiring in raceways containing Class 1 wiring. Boxes and panels containing high-voltage wiring may not be used for low-voltage wiring except for the purpose of interfacing the two.
- G. Do not install wiring in raceway containing tubing.
- H. Where Class 2 wiring is installed exposed, wiring is to be routed parallel or perpendicular to building lines and neatly tied at a maximum of 10-foot intervals.
- I. Where plenum cables are used without raceway, support, or anchor cable from building structure. Do not anchor or support cable from ductwork, electrical raceways, piping, or suspended ceiling systems.
- J. Provide all wire-to-device connections at terminal block or terminal strip. Provide all wire-to-wire connections at terminal block.
- K. Neatly bundle wiring located within enclosures to permit access to devices and terminals.
- L. Maximum allowable voltage for control wiring shall be 120V. If only higher voltages are available, Contractor shall provide a step-down transformer.
- M. All wiring shall be installed as continuous lengths with no splices permitted between termination points.
- N. Install plenum wiring in sleeves where it passes through walls and floors. Provide fire-stop foam where necessary to maintain fire rating.
- O. Provide size of raceway and size and type of wire as required by NEC and as required to meet manufacturers' recommendations for connected equipment.
- P. Include one pull string in each raceway 1-inch or larger.
- Q. Use color coded conductors throughout.
- R. Locate control and status relays in designated enclosures only. Such enclosures include packaged equipment control cabinets unless such cabinets also contain Class 1 starters.
- S. Conceal all raceways except within mechanical, electrical, or service rooms. Maintain minimum raceway clearance of 6-inches from high temperature equipment such as steam piping or boiler flues.
- T. Secure raceways with raceway clamps fastened to the structure and spaced in accordance with code requirements. Raceways and pull boxes may not be hung on flexible duct strap or tie rods. Raceways may not be supported from ductwork, electrical raceways, piping, or suspended ceiling systems.
- U. Install insulated bushings on all raceway ends and openings to enclosures. Seal top end of all raceways.
- V. Maintain updated wiring diagrams (as-built) at site with terminations identified.

- W. Flexible metal raceways and liquid-tight, flexible metal raceways shall not exceed 3-feet in length and shall be supported at both ends. Flexible metal raceways less than ½-inch electrical trade size shall not be used. In areas exposed to moisture, including but not limited to chiller and boiler rooms, liquid-tight, flexible metal raceways shall be used.

3.06 COMMUNICATION WIRING

- A. Install in accordance with 3.04 above.
- B. Follow manufacturers' recommendations for all communications cabling including but not limited to maximum pulling, tension, and bend radius.
- C. Do not install communications cabling in a raceway or enclosure containing Class 1 or other Class 2 wiring.
- D. Verify the integrity of the entire network immediately following cable installation using test measures appropriate for each cable.
- E. Provide a lightning arrestor between cables and grounds where cable enters or exits a building. Install arrestor in accordance with manufacturers' recommendations.
- F. All communications wiring shall be un-spliced length when that length is commercially available.
- G. All communications wiring shall be labeled to indicate origination and destination.
- H. Ground coaxial cable in accordance with NEC regulations article on "Communications Circuits, Cable and Protector Grounding."

3.07 IDENTIFICATION OF HARDWARE AND WIRING

- A. Label all wiring and cabling, including wiring and cabling terminating within factory-fabricated panels, within 2 inches of termination with the BAS address or termination number.
- B. Permanently label or code each point of field terminal strips to show the instrument or item served.
- C. Identify control panels with minimum ½-inch letters on laminated plastic nameplate.
- D. Identify all other control components with permanent labels. All plug-in components shall be labeled so that removal of component does not remove label.
- E. Identify room sensors relating to terminal box or valves with nameplate located within sensor cover.
- F. Arrange components so that UL or CSA labels are visible after equipment is installed.
- G. Identifiers shall match record documents.
- H. Provide laminated network communication diagrams, point-to-point wiring diagrams, and process control diagrams in each control panel for control components contained therein.

3.08 CONTROL SYSTEM CHECKOUT AND TESTING

- A. Contractor shall completely test and verify specified control system performance. Compile test results and include with written certification.
- B. Contractor shall furnish all labor and test apparatus required to install and calibrate all instruments, controls, and accessory equipment furnished hereunder.
- C. Contractor shall perform the following testing and verification:
 - 1. Verify that all control and communications wiring is properly connected and free of all shorts and ground faults. Verify that terminations are tight.
 - 2. Enable control systems and verify instrument calibration and end-to-end reporting accuracy of all input devices individually. Perform calibration in accordance with manufacturers' recommendations. Repair or replace all temperature sensors requiring a calibration offset greater than +/- 1°F.
 - 3. Verify control stability and end-to-end reporting requirements are met.
 - 4. Verify that all binary output devices (relays, solenoid valves, two-position actuators and control valves, magnetic starters, etc.) operate properly and that normal positions are correct.

5. Verify that all analog output devices (I/Ps, actuators, etc.) are functional, start/stop and span are correct, and direction and normal position are correct.
 6. Verify that system operation complies with the sequence of operations. Simulate and observe all modes of operation by overriding and varying inputs and schedules. Tune all control loops and optimum start/stop routines.
 7. Alarms and Interlocks:
 - a. Check each alarm separately by including an appropriate signal at a value that will trip the alarm.
 - b. Trip interlocks using field contacts to check the logic and ensure that the fail-safe condition for all actuators is in the proper direction.
 - c. Test interlock actions by simulating alarm conditions to check the initiating value of the variable and the interlock action.
- D. Contractor shall maintain the following documentation:
1. Calibration log including date, time, control system readout, means of verification, verification measurement, and required calibration offset for each analog input.
- E. After system operation is completely verified, provide written certification to Owner that systems have been fully tested and are operating according to specifications and ready for functional testing. Provide copies of documentation signed by person performing tests. Documentation to include:
1. Calibration logs
 2. Operational logs

3.09 DEMONSTRATION AND ACCEPTANCE

- A. Demonstrate operation of control system to Owner and Engineer.

3.10 TRAINING

- A. Provide a minimum of 4 hours training to Owner's personnel in use and maintenance of control hardware and software.

END OF SECTION

**SECTION 23 3113
METAL DUCTWORK**

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes metal ductwork, liner, and related fittings and sealants.

1.02 PERFORMANCE REQUIREMENTS

- A. Duct construction, including sheet metal thicknesses, seam and joint construction, reinforcements, and hangers and supports, shall comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" and performance requirements and design criteria indicated in "Duct Schedule" Article.
- B. Structural Performance: Duct hangers and supports shall withstand the effects of gravity and seismic loads and stresses within limits and under conditions described in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"
- C. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.

1.03 ACTION SUBMITTALS

- A. See Section 23 05 00 for general submittal requirements.
- B. Materials List:
1. Shop fabricated ductwork:
- C. Catalog Data:
1. Pre-manufactured Ductwork and Fittings.

1.04 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.05 QUALITY ASSURANCE

- A. Comply with applicable requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment" and Section 7 - "Construction and System Start-up."
- B. Comply with applicable requirements in ASHRAE/IESNA 90.1, Section 6.4.4 - "HVAC System Construction and Insulation."

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Ductwork Dimensions: Ductwork dimensions shown on drawings are internal dimensions. Adjust outer ductwork size to accommodate liner, double wall construction, or other conditions that would affect interior clear duct opening size.

2.02 SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS

- A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated.
- B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-1, "Rectangular Duct/Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-2, "Rectangular Duct/Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

- D. Elbows, Transitions, Offsets, Branch Connections, and Other Duct Construction: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 4, "Fittings and Other Construction," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- E. Sealing Requirements:
 - 1. Concealed: Seal longitudinal seams and transverse joints with liquid duct sealer or tape-and-adhesive. Flanged, gasketed joints that meet seal requirements do not require separate duct sealant application.

2.03 SINGLE-WALL ROUND DUCTS AND FITTINGS

- A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 3, "Round, Oval, and Flexible Duct," based on indicated static-pressure class unless otherwise indicated.
- B. General: Round ductwork may be either shop or factory fabricated.
- C. Manufacturers: Subject to compliance with requirements, available manufacturers offering factory fabricated products that may be incorporated into the Work include, but are not limited to the following:
 - 1. McGill AirFlow LLC.
 - 2. MKT Metal Manufacturing.
 - 3. Sheet Metal Connectors, Inc.
 - 4. Spiral Manufacturing Co., Inc.
- D. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-1, "Round Duct Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- E. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-2, "Round Duct Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- F. Tees and Laterals: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-5, "90 Degree Tees and Laterals," and Figure 3-6, "Conical Tees," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- G. Sealing Requirements:
 - 1. Concealed: Flanged, gasketed joints that meet seal requirements do not require separate duct sealant application.

2.04 SHEET METAL MATERIALS

- A. General Material Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.
- B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.
 - 1. Galvanized Coating Designation: G60.
 - 2. Finishes for Surfaces Exposed to View: Mill phosphatized.
- C. Reinforcement Shapes and Plates: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
- D. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.05 SEALANT AND GASKETS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Ductmate Industries
 - 2. McGill AirSeal LLC.
 - 3. Carlisle HVAC Products
- B. General Sealant and Gasket Requirements: Surface-burning characteristics for sealants and gaskets shall be a maximum flame-spread index of 25 and a maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.
- C. Two-Part Tape Sealing System:
 - 1. Tape: Woven cotton fiber impregnated with mineral gypsum and modified acrylic/silicone activator to react exothermically with tape to form hard, durable, airtight seal.
 - 2. Tape Width: 4 inches.
 - 3. Sealant: Modified styrene acrylic.
 - 4. Water resistant.
 - 5. Mold and mildew resistant.
 - 6. Maximum Static-Pressure Class: 10-inch w.g., positive and negative.
 - 7. Service: Indoor and outdoor.
 - 8. Service Temperature: Minus 40 to plus 200 deg F.
 - 9. Substrate: Compatible with galvanized sheet steel.
 - 10. For indoor applications, sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 11. Sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- D. Water-Based Joint and Seam Sealant:
 - 1. Application Method: Brush on.
 - 2. Solids Content: Minimum 65 percent.
 - 3. Shore A Hardness: Minimum 20.
 - 4. Water resistant.
 - 5. Mold and mildew resistant.
 - 6. VOC: Maximum 75 g/L (less water).
 - 7. Maximum Static-Pressure Class: 10-inch w.g., positive and negative.
 - 8. Service: Indoor or outdoor.
 - 9. Substrate: Compatible with galvanized sheet steel.
- E. Flanged Joint Sealant: Comply with ASTM C 920.
 - 1. General: Single-component, acid-curing, silicone, elastomeric.
 - 2. Type: S.
 - 3. Grade: NS.
 - 4. Class: 25.
 - 5. Use: O.
 - 6. For indoor applications, sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 7. Sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- F. Flange Gaskets: Butyl rubber, neoprene, or EPDM polymer with polyisobutylene plasticizer.

2.06 HANGERS AND SUPPORTS

- A. Hanger Rods for Noncorrosive Environments: Cadmium-plated steel rods and nuts.
- B. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct."

- C. Steel Cables for Galvanized-Steel Ducts: Galvanized steel complying with ASTM A 603.
- D. Steel Cable End Connections: Cadmium-plated steel assemblies with brackets, swivel, and bolts designed for duct hanger service; with an automatic-locking and clamping device.
- E. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.
- F. Trapeze and Riser Supports:
 1. Supports for Galvanized-Steel Ducts: Galvanized-steel shapes and plates.

PART 3 - EXECUTION

3.01 DUCT INSTALLATION

- A. Existing ductwork is fiberglass ductboard. Connections to existing shall be durable and made to maintain the sealing requirements listed herein.
- B. Drawing plans, schematics, and diagrams indicate general location and arrangement of duct system. Indicated duct locations, configurations, and arrangements were used to size ducts and calculate friction loss for air-handling equipment sizing and for other design considerations. Install duct systems as indicated unless deviations to layout are approved by Engineer.
- C. Install ducts according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" unless otherwise indicated.
- D. Install round ducts in maximum practical lengths.
- E. Install ducts with fewest possible joints.
- F. Install factory- or shop-fabricated fittings for changes in direction, size, and shape and for branch connections.
- G. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.
- H. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.
- I. Install ducts with a clearance of 1 inch, plus allowance for insulation thickness.
- J. Route ducts to avoid passing through electrical equipment rooms and enclosures.
- K. Protect duct interiors from moisture, construction debris and dust, and other foreign materials. Comply with SMACNA's "IAQ Guidelines for Occupied Buildings Under Construction," Appendix G, "Duct Cleanliness for New Construction Guidelines."

3.02 DUCT SEALING

- A. Provide Seal Class in accordance with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible,"
- B. Clean duct surfaces prior to applying sealant.
- C. Prior to application, verify that ducts are dry and within specified temperature limits.
- D. Open ends of completed and overnight work-in-progress shall be sealed.

3.03 HANGER AND SUPPORT INSTALLATION

- A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 5, "Hangers and Supports."
- B. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.
 1. Where practical, install concrete inserts before placing concrete.
 2. Install powder-actuated concrete fasteners after concrete is placed and completely cured.
 3. Use powder-actuated concrete fasteners for standard-weight aggregate concretes or for slabs more than 4 inches thick.
 4. Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches thick.
 5. Do not use powder-actuated concrete fasteners for seismic restraints.

6. Confirm design of existing concrete slabs prior to installing fasteners. Where existing slabs contain embedded components such as tension cables. Locate embedded components and install fasteners to so that embedded components remain undamaged.
- C. Hanger Spacing: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct," for maximum hanger spacing; install hangers and supports within 24 inches of each elbow and within 48 inches of each branch intersection.
- D. Support vertical ducts with steel angles or channel secured to the sides of the duct with welds, bolts, sheet metal screws, or blind rivets; support at each floor and at a maximum interval of 16 feet.
- E. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

3.04 CONNECTIONS

- A. Make connections to equipment with flexible connectors complying with Section 23 33 00 – Air Duct Accessories.
- B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.

3.05 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Duct System Cleanliness Tests:
 1. Visually inspect duct system to ensure that no visible contaminants are present.
- C. Duct system will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

3.06 START UP

- A. Air Balance: Comply with requirements in Section 23 05 93 – Testing, Adjusting, and Balancing for HVAC.

3.07 DUCT SCHEDULE

- A. Fabricate ducts with galvanized sheet steel.
- B. Pressure Class
 1. Rating shall be the largest of the following conditions.
 - a. 2-inch minimum.
 2. Ductwork connected to fan discharge shall be rated for positive pressure.
 3. Ductwork connected to the fan inlet shall be rated for negative pressure.
- C. Seal Class
 1. Class A
- D. Leakage Class
 1. Leakage Class as required to meet recommended maximum leakage percentages as tabulated in ASHRAE Handbook “ HVAC Systems and Equipment -2012, Chapter 19, Table 2
- E. All ductwork single wall, except as otherwise indicated.
- F. Supply Ducts:
 1. Ducts Connected to Heat Pumps:
 - a. Pressure Class: Positive 2-inch w.g.
- G. Return Ducts:
 1. Ducts Connected to Heat Pumps:
 - a. Pressure Class: 2-inch w.g.
- H. Intermediate Reinforcement: Match duct material.

- I. Elbow Configuration:
 - 1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-2, "Rectangular Elbows."
 - a. Velocity 800 fpm or Lower:
 - 1) Radius Type RE 1 with minimum 0.5 radius-to-diameter ratio.
 - 2) Mitered Type RE 4 without vanes.
 - b. Velocity 800 to 1500 fpm:
 - 1) Radius Type RE 1 with minimum 1.0 radius-to-diameter ratio.
 - 2) Radius Type RE 3 with minimum 0.5 radius-to-diameter ratio and two vanes.
 - 3) Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-3, "Vanes and Vane Runners," and Figure 4-4, "Vane Support in Elbows."
 - c. Velocity 1500 fpm or Higher:
 - 1) Radius Type RE 1 with minimum 1.5 radius-to-diameter ratio.
 - 2) Radius Type RE 3 with minimum 1.0 radius-to-diameter ratio and two vanes.
 - 3) Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-3, "Vanes and Vane Runners," and Figure 4-4, "Vane Support in Elbows."
 - 2. Round Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-4, "Round Duct Elbows."
 - a. Minimum Radius-to-Diameter Ratio and Elbow Segments: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 3-1, "Mitered Elbows." Elbows with less than 90-degree change of direction have proportionately fewer segments.
 - 1) Velocity 1000 fpm or Lower: 0.5 radius-to-diameter ratio and three segments for 90-degree elbow.
 - 2) Velocity 1000 to 1500 fpm: 1.0 radius-to-diameter ratio and four segments for 90-degree elbow.
 - 3) Velocity 1500 fpm or Higher: 1.5 radius-to-diameter ratio and five segments for 90-degree elbow.
 - b. Construction:
 - 1) Round Elbows, 12 Inches and Smaller in Diameter: Stamped, pleated, or standing seam, except fully welded where required for adjoining ductwork.
 - 2) Round Elbows, 14 Inches and Larger in Diameter: Standing seam or welded, except fully welded where required for adjoining ductwork.
- J. Branch Configuration:
 - 1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-6, "Branch Connection."
 - a. Rectangular Main to Rectangular Branch: 45-degree entry.
 - b. Rectangular Main to Round Branch:
 - 1) Velocity less 1000 fpm: Conical tap or 45-degree entry.
 - 2) Velocity 1000 fpm or Higher: 45-degree entry.
 - 2. Round: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-5, "90 Degree Tees and Laterals," and Figure 3-6, "Conical Tees." Saddle taps are permitted in existing duct.
 - a. Velocity less 1000 fpm: Conical tap or 45-degree lateral.
 - b. Velocity 1000 fpm or Higher: 45-degree lateral.

END OF SECTION

**SECTION 23 3300
AIR DUCT ACCESSORIES**

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes: Accessories for duct systems.

1.02 ACTION SUBMITTALS

- A. Provide submittals for products listed in the Product Table below in accordance with Section 23 0500 – General HVAC Provisions. Submittal requirements indicated by column number designation as follows:
 - 1. Materials List
 - 2. Catalog Data
 - 3. Product Data
 - 4. Performance Data
 - 5. Wiring Diagrams
 - 6. Shop Drawings
 - 7. Installation Instructions
 - 8. Special Requirement listed herein.

PRODUCT TABLE	1	2	3	4	5	6	7	8
Manual Volume Dampers		x						
Turning Vanes		x						
Flexible Ducts		x						

- B. Shop Drawings: For duct accessories. Include plans, elevations, sections, details and attachments to other work.
 - 1. Detail duct accessories fabrication and installation in ducts and other construction. Include dimensions, weights, loads, required clearances, and method of field assembly into duct systems and other construction. Include the following:
 - a. Special fittings.
 - b. Manual volume damper and remote damper operator's installations.

1.03 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For air duct accessories to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.01 ASSEMBLY DESCRIPTION

- A. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."
- B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

2.02 MATERIALS

- A. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.
 - 1. Galvanized Coating Designation: G60.
- B. Reinforcement Shapes and Plates: Galvanized-steel reinforcement where installed on galvanized sheet metal ducts; compatible materials for aluminum and stainless-steel ducts.
- C. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.03 MANUAL VOLUME DAMPERS

- A. Acceptable Manufacturers
 - 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. Greenheck
 - b. Nailor Industries Inc.
 - c. Pottorff.
 - d. Ruskin Company.
 - e. Trox USA Inc.
 - f. Young Regulator Company.
- B. Round/Oval Single Blade Manual Volume Dampers:
 - 1. Operating Conditions:
 - a. Maximum temperature: 180°F
 - b. Maximum differential pressure: 1-inch water column.
 - c. Maximum air velocity: 2,000 fpm.
 - d. Standard leakage rating.
 - 2. Suitable for horizontal or vertical applications.
 - 3. Frames:
 - a. One piece 20-gauge construction. Material to match connected ductwork.
 - 4. Blades:
 - a. Single blade.
 - b. 20-gauge construction. Material to match connected ductwork.
 - c. Stiffen damper blades for stability.
 - 5. Blade Axles: Minimum 3/8-inch diameter plated steel or stainless steel, except stainless steel where adjacent ductwork is aluminum or stainless steel.
 - 6. Bearings:
 - a. Dampers shall have axles full length of damper blades and bearings at both ends of operating shaft.
 - 7. Actuator:
 - a. Manual locking quadrant, except where remote damper operator is required.
 - b. Elevated platform for insulated duct mounting.
- C. Single Blade Rectangular Manual Volume Dampers:
 - 1. Operating Conditions:
 - a. Maximum temperature: 180°F
 - b. Maximum differential pressure: 1-inch water column.
 - c. Maximum air velocity: 2,000 fpm.
 - d. Standard leakage rating.
 - 2. Suitable for horizontal or vertical applications.
 - 3. Frames: Hat-shaped, welded or gusset reinforced corners. 18-gauge construction. Material to match connected ductwork.
 - 4. Blades:
 - a. Single blade.
 - b. 20-gauge construction. Material to match connected ductwork.
 - c. Stiffen damper blades for stability.
 - 5. Blade Axles: Minimum 1/2 inch dia. plated steel or stainless steel, except stainless steel where adjacent ductwork is aluminum or stainless steel.
 - 6. Linkages: Concealed in jamb outside or air stream.
 - 7. Bearings:
 - a. Dampers shall have axles full length of damper blades and bearings at both ends of operating shaft.
 - 8. Actuator:
 - a. Manual locking quadrant, except where remote damper operator is required.
 - b. Elevated platform for insulated duct mounting.

2.04 TURNING VANES

- 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:
 - 1. Ductmate Industries, Inc.
 - 2. Duro Dyne Inc.
 - 3. Elgen Manufacturing.
 - 4. SEMCO LLC.
- B. General Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"; Figures 4-3, "Vanes and Vane Runners," and 4-4, "Vane Support in Elbows."
- C. Manufactured Turning Vanes for Metal Ducts: Curved blades of galvanized sheet steel; support with bars perpendicular to blades set; set into vane runners suitable for duct mounting.
 - 1. Acoustic Turning Vanes: Fabricate airfoil-shaped aluminum extrusions with perforated faces and fibrous-glass fill.
- D. Vane Construction: Single wall for ducts up to 18 inches wide and double wall for larger dimensions.

2.05 FLEXIBLE DUCTS

- 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:
 - 1. Flexmaster U.S.A., Inc.
 - 2. JP Lamborn Co.
 - 3. McGill AirFlow LLC.
 - 4. Thermaflex; a Flex-Tek Group company.
- B. Insulated, Flexible Duct: UL 181, Class 1, 2-ply vinyl film supported by helically wound, spring-steel wire; fibrous-glass insulation; polyethylene or aluminized vapor-barrier film.
 - 1. Pressure Rating: 10-inch wg positive and 1.0-inch wg negative.
 - 2. Maximum Air Velocity: 4,000 fpm.
 - 3. Temperature Range: Minus 10 to plus 160°F.
 - 4. Insulation R-value: R 4.2.
- C. Insulated, Flexible Duct: UL 181, Class 1, black polymer film supported by helically wound, spring-steel wire; fibrous-glass insulation; polyethylene or aluminized vapor-barrier film.
 - 1. Pressure Rating: 4-inch wg positive and 0.5-inch wg negative.
 - 2. Maximum Air Velocity: 4,000 fpm.
 - 3. Temperature Range: Minus 20 to plus 175°F.
 - 4. Insulation R-Value: R4.2.
- D. Flexible Duct Elbow Support:
 - 1. Manufacturers: Titus, Flexright, Thermaflex, FlexFlow, or equal.
 - 2. Description: Radius forming brace to support flexible air ducts. UL 2043 listed.
 - 3. Material" polypropylene brace, nylon cable ties to secure duct to boards.
 - a. Flexright.

2.06 DUCT ACCESSORY HARDWARE

- A. Instrument Test Holes: Cast iron or cast aluminum to suit duct material, including screw cap and gasket. Size to allow insertion of pitot tube and other testing instruments and of length to suit duct-insulation thickness.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install duct accessories according to applicable details in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for metal ducts and in NAIMA AH116, "Fibrous Glass Duct Construction Standards," for fibrous-glass ducts.
- B. Install duct accessories of materials suited to duct materials; use galvanized-steel accessories in galvanized-steel and fibrous-glass ducts, stainless-steel accessories in stainless-steel ducts, and aluminum accessories in aluminum ducts.

- C. Install products in locations that are accessible and that will permit adjustment and maintenance from floor, equipment platforms, or catwalks. Where ladders are required for Owner's access, confirm unrestricted ladder placement is possible under occupied condition.
- D. Manual Volume Dampers:
 - 1. Install in ductwork where shown on drawings and as required to properly balance airflow rates to values shown on Drawings. Provide damper for each air inlet and outlet.
 - 2. Install volume dampers at points on supply, return, and exhaust systems where branches extend from larger ducts. Where dampers are installed in ducts having duct liner, install dampers with hat channels of same depth as liner, and terminate liner with nosing at hat channel.
 - 3. Dampers must be accessible to allow inspection, adjustment, and replacement of components.
 - a. Where manual actuators are not accessible for adjustment provide remote manual cable actuator. An actuator is not accessible if it is located more than 24 inches horizontally from an access point or more than 48 inches above an access point. Coordinate location of actuator drive assembly with Engineer.
 - 4. Do not compress or stretch the damper frame into the duct or opening. Damper shall move freely throughout full range of travel.
 - 5. Dampers shall be rigid and secure not producing any audible noise due to vibration of components.
 - 6. Set dampers to fully open position before testing, adjusting, and balancing.
- E. Turning Vanes
 - 1. Install in mitered ductwork elbows and as shown on drawings.
 - 2. Install with leading and trailing edges parallel to entering and leaving airflow.
- F. Flexible Ductwork
 - 1. Install in professional manner with straight sections without bends or sagging. Bends in flexible ductwork shall not exceed 20 degree unless supported by a Flexible Duct Elbow Support. Maximum length of 48-inches or as detailed on Drawings.
 - 2. Connect flexible duct directly to diffusers and grilles, except where otherwise shown on drawings. Provide Flexible Duct Elbow Support at 90-degree elbow to diffuser or grille.
 - 3. Connect flexible ducts to metal ducts with tape and draw bands.
 - a. Tape inner duct liner to ductwork.
 - b. Secure inner duct liner with nylon draw strap.
 - c. Secure outer liner with nylon draw strap.
- G. Test Holes
 - 1. Install test holes at fan inlets and outlets, coil inlets and outlets, and elsewhere as indicated.

3.02 APPLICATION

- A. Manual Volume Dampers:
 - 1. Material: Volume damper construction frame and blade material shall match material of connected ductwork.
 - 2. Type:
 - a. Round/Oval Single Blade Manual Volume Dampers: All round ductwork 20-inch diameter and below.
 - b. Rectangular Single Blade Manual Volume Dampers: Rectangular ductwork where largest cross-sectional dimension is 18-inches and below.

3.03 FIELD QUALITY CONTROL

- A. Tests and Inspections:
 - 1. Operate dampers to verify full range of movement.
 - 2. Inspect turning vanes for proper and secure installation.

END OF SECTION

SECTION 23 3713
AIR OUTLETS AND INLETS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Diffusers
 - 2. Grilles

1.02 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Data Sheet: Indicate materials of construction, finish, and mounting details; and performance data including throw and drop, static-pressure drop, and noise ratings.

1.03 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Ceiling suspension assembly members.
 - 2. Size and location of initial access modules for acoustical tile.
 - 3. Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.
 - 4. Duct access panels.

PART 2 - PRODUCTS

2.01 COMMON REQUIREMENTS

- A. Source Quality Control
 - 1. Verification of Performance: Rate diffusers according to ASHRAE 70, "Method of Testing for Rating the Performance of Air Outlets and Inlets."
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following, unless specifically stated otherwise:
 - 1. Anemostat Products; a Mestek company.
 - 2. Krueger.
 - 3. Nailor Industries Inc.
 - 4. Price Industries.
 - 5. Titus.

2.02 RECTANGULAR AND SQUARE CEILING DIFFUSERS

- A. Square and Rectangular Neck Louvered Diffusers SD-1
 - 1. Basis of Design: Titus TDC
 - 2. Material: Steel.
 - 3. Finish: Baked enamel, white.
 - 4. Duct Inlet: Round, size as shown on Drawings.
 - 5. Pattern: Four-way core style, or as shown on drawings. Provide adjustable pattern controller to adjust vertical to horizontal blow pattern where shown on Drawings.
 - 6. Mounting:
 - a. Suspended Ceiling: Flush, border type and module size compatible with ceiling system.

2.03 RETURN GRILLES

- A. Fixed Blade Grille RG/EG-1
 - 1. Basis of Design: Titus 350 RL/RS
 - 2. Material: Steel.
 - 3. Finish: Baked enamel, white.
 - 4. Blade Arrangement: 35-degree blade deflection. Spaced 3/4 inch apart. Blades parallel to long dimension if installed in ceiling or horizontal position. Blades parallel to floor if installed in wall or vertical position.

5. Frame: 1-1/4 inches wide.
6. Mounting:
 - a. Suspended Ceiling: Flush, border type and module size compatible with ceiling system.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine areas where diffusers are installed for compliance with requirements for installation tolerances and other conditions affecting performance of equipment.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install diffusers level and plumb.
- B. Ceiling-Mounted Outlets and Inlets: Drawings indicate general arrangement of ducts, fittings, and accessories. Air outlet and inlet locations have been indicated to achieve design requirements for air volume, noise criteria, airflow pattern, throw, and pressure drop. Make final locations where indicated, as much as practical. For units installed in lay-in ceiling panels, locate units in the center of panel. Where architectural features or other items conflict with installation, notify Architect for a determination of final location.
- C. Install diffusers with airtight connections to ducts and to allow service and maintenance of dampers, air extractors, and fire dampers.
- D. Mounted devices tight to finished surface.
- E. Provide boot or transition from return grilles to round duct size indicated on drawings.

3.03 ADJUSTING

- A. After installation, adjust diffusers to air patterns indicated, or as directed, before starting air balancing.

END OF SECTION

**SECTION 23 8146
AIR SOURCE HEAT PUMPS**

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Packaged air source rooftop heat pump.

1.02 DESIGN REQUIREMENTS

- A. Unit shall be capable of operating with entering air temperatures between 20°F and 120°F.

1.03 ACTION SUBMITTALS

- A. Provide submittals for products listed in the Product Table below in accordance with Section 23 05 00 – General HVAC Provisions. Submittal requirements indicated by column number designation as follows:
 1. Materials List
 2. Catalog Data
 3. Product Data
 4. Performance Data
 5. Wiring Diagrams
 6. Shop Drawings
 7. Installation Instructions
 8. Special Requirement listed herein.

PRODUCT TABLE	1	2	3	4	5	6	7	8
Water source heat pump			X	X				

1.04 QUALITY ASSURANCE

- A. Unit shall be UL listed
- B. Unit shall be AHRI/ISO 13256-1 certified and listed by ETL.
- C. Each unit shall be run-tested at the factory to verify unit performance.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Accept products on site in factory-fabricated protective containers, with factory-installed shipping skids. Inspect for damage.
- B. Store in clean dry place and protect from weather and construction traffic. Handle carefully to avoid damage to components, enclosures, and finish.

PART 2 - PRODUCTS

2.01 AIR SOURCE HEAT PUMP

- A. Acceptable Manufacturers: Carrier, Daikin Applied, Trane.
- B. Factory-assembled heat pump unit with reverse cycle for heating and cooling operation, completely assembled, piped and internally wired. Downflow configuration as shown on drawings.
- C. Cabinet and Frame Construction: All components shall be mounted in a weather resistant steel cabinet with an enamel finish. Exterior panels insulated with ½" thick, cleanable foil backed, NFPA 90A fire resistant insulation. Seismic mounting brackets. Inlet and outlet duct connections.
 1. Drain pans: Plastic or stainless-steel pan. Terminate drain connection on side of unit. Sloped for complete drainage with no standing water. Provide float switch or solid-state electronic condensate overflow protection.
- D. Fan Section: Fans shall be direct drive, forward curved, centrifugal, double width, double inlet type; statically and dynamically balanced at factory. L50-100,000 bearing, concentric mounted, Air Handler quality. Fan/motors assembly mounted on a neoprene mount vibration isolators. The

fan housing shall be removable from the unit without disconnecting the supply air ductwork for servicing of the fan motor.

1. Motor: ECM type, soft starting, minimum 5 adjustable fan speed settings. Motors shall be permanently lubricated and have thermostatic overload protection. Locate adjacent to access door.
- E. Refrigerant Compressor: High-efficiency single speed scroll type designed for heat pump duty and mounted on vibration isolators. Acoustically deadened galvanized steel mounting bracket to prevent vibration transmission to the cabinet.
- F. Refrigerant Heat Exchanger: Coaxial tube water-to-refrigerant heat exchanger. 600 PSIG working refrigerant pressure and 450 PSIG working water pressure.
 1. Refrigerant heat exchanger, water lines and refrigerant suction lines shall be insulated to prevent condensation at low liquid temperatures below 50°F.
- G. Refrigerant Coil: Coil constructed of seamless copper tubes with mechanically bonded aluminum fins. 600 PSIG working refrigerant pressure. Stainless steel or PVC condensate drain pan sloped to drain outlet and piped to exterior drain piping connection. Secondary condensate overflow float switch, interlock float switch to shutoff supply fan and activate system alarm.
- H. Refrigerant Circuit: Sealed refrigerant circuit including hermetic compressor, bidirectional thermostatic expansion valve, reversing valve, and service ports. R410A refrigerant
- I. Filter Section: 2-inch pleated, MERV 8
- J. Economizer:
 1. 0-100% fresh air damper, damper drive motor fixed dry bulb enthalpy control and low voltage pigtails for electrical connections.
 2. Relay kit for interfacing the economizer to the heat pump.
- K. Electrical:
 1. Single Point Electrical Power Connections: Complete power and control wiring factory assembled and tested.
 2. Control transformer.
 3. Wiring Termination: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated.
- L. Controls: Microprocessor control system.
 1. Heat Pump Control: Microprocessor-based controller that interfaces with a multi-stage electronic thermostat or building automation system to monitor and control unit operation. Provide operational sequencing, fan speed control-, high- and low-pressure switch monitoring, freeze detection, condensate overflow sensing, auxiliary heat staging, lockout mode control, LED status and fault indicators, fault memory, field selectable options and accessory output. The control shall provide fault retry three times before locking out to limit nuisance trips.
 2. BAS Controls: Compressor and fan control by the Building Automation System (BAS). Provide terminal strip for BAS fan, compressor and reversing valve digital input.
- M. Capacity & Performance: As scheduled on Drawings.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. General: Install in accordance with manufacturer's installation instruction. Install units plumb and level, firmly anchored in locations indicated, and maintain manufacturer's recommended clearances.

3.02 START-UP

- A. Manufacturer's certified representative to provide the following services:
 1. Inspect after installation to ensure equipment is installed in accordance with manufacturer's recommendation.
 2. Supervise initial start-up.
 3. Adjust control system parameters and setpoints to obtain specified performance.

4. Provide a minimum of 2 hours of training, including operation and maintenance.

3.03 DEMONSTRATION

- A. Demonstration system operation and adjustment of control system setpoints and parameters to Owner's Authorized Representative.

END OF SECTION

SECTION 26 0155
ELECTRICAL SYSTEMS FIRESTOPPING

PART 1 - GENERAL

1.01 SCOPE

- A. Section includes requirements for through-penetration fire stopping for items including, but not limited to, conduit and cable tray provided under Divisions 26, 27, and 28.
- B. Section also includes requirements for recessing fixtures, cabinets, or devices in fire rated walls, ceilings, and floors.
- C. Products shall be of a single manufacturer for each type of fire stopping required, and where several types are integrated into a single assembly. Provide putty sealants, wraps, boards, and accessories as necessary and required for the work of this project.

1.02 REFERENCES

- A. Underwriters Laboratories:
 - 1. UL Fire Resistance Directory
 - 2. UL Component Listing Test Criteria
 - 3. Warnock Hersey
- B. American Society for Testing and Materials Standards:
 - 1. ASTM E 814 – 88: Standard Test Method for Fire Tests of Through-Penetration Firestops.
- C. International Building Code, current edition, with Oregon Amendments (Oregon Structural Specialty Code, OSSC, current edition) – Chapter 7 Fire Resistance Rated Construction.

1.03 DEFINITIONS

- A. Assembly: Particular arrangement of materials specific to a given type of construction.
- B. Barriers: Time rated fire walls, ceiling/floor assemblies, and structural floors.
- C. Fire Stopping: Assembly of materials applied at penetrations to limit spread of heat, fire, gases, and smoke.
- D. Penetration: Opening through or into a barrier such the full thickness of rated materials is not obtained.
- E. System: Specific products and applications, classified and numbered by Underwriters Laboratories (UL), Inc. to close specific barrier penetrations.
- F. F Rating: Time period that fire stop assembly can withstand fire and hose stream test as determined in UBC Standard 7-5.
- G. T Rating: As required for F Rating and to limit temperature rise above initial temperature to 325 degrees F on protected sides as determined in UBC Standard 7-5.

1.04 SHOP DRAWINGS, PRODUCT DATA, OPERATION & MAINTENANCE DATA

- A. Provide manufacturer's installation drawings and instructions for each proposed assembly. Identify intended product and applicable UL System number or UL classified devices.
- B. Provide manufacturer recommendations and drawings relating to non-standard applications where necessary.

1.05 QUALITY ASSURANCE

- A. Installer Qualification: Acceptable to, or certified by, Fire Stopping system manufacturer.
- B. Regulatory Requirement: Contractor shall verify acceptance from Authority Having Jurisdiction for proposed assemblies conforming to, or not conforming to, specific UL Fire Stop System Numbers, or UL classified devices.
- C. Products shall comply with the requirements of Oregon Revised Statute (ORS) 453.005 (7) (e), effective January 1, 2011. The referenced statute limits the use of three types of brominated fire-retardant chemicals, which are defined as hazardous substances.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products in original, unopened packaging with legible manufacturer's identification. Store materials in accordance with manufacturer's instructions. Store in clean, dry, ventilated location, protected from freezing.

1.07 WARRANTY

- A. Submit copies of written warranty for Fire Stopping assemblies. Warranty period shall be one year minimum.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Fire Stop products and accessories shall be asbestos-free, intumesce when exposed to temperatures of 250 degrees F, and maintain an effective barrier against flame, smoke and gases. Mortar systems must be Warnock Hersey approved.
- B. Fire Stop Fire Rating: Not less than the rating of barrier penetrated in which fire stopping will be installed.

2.02 FIRE STOPPING ASSEMBLIES

- A. Assemblies of materials used to seal spaces around penetrations shall have a UL Fire Stop System Number appropriate for the construction type, penetration type, annular space requirements, and fire rating at each penetration.
- B. Systems and devices must withstand the passage of cold smoke either as an inherent property of the system or by the use of a separate product included as part of the UL system or devices and designed to perform this function. Systems complying with the requirements for through-penetration firestopping in fire-rated construction are acceptable provided the system will provide a smoke seal.
- C. Performance Requirements: Fire Stop assembly shall be able to withstand standard fire and hose stream test (F Rating) and limit temperature rise (T Rating) of penetrations on protected side as required by Authorities Having Jurisdiction. Conform to UBC Standard 7-5.
- D. Manufacturers: 3M, Dow, Chase Technology Corp., Bio Fireshield Inc., Johns Manville, Specified Technologies Inc., Metacaulk, GS Hevi-Duti/Nelson, or approved.

2.03 ACCESSORIES

- A. Fill, void, or cavity materials: As classified under category XHHW in the UL Fire Resistance Directory.
- B. Forming materials: As classified under category XHKU in the UL Fire Resistance Directory.

PART 3 - EXECUTION

3.01 GENERAL

- A. Provide Fire Stopping seal at cable tray, wiring, or conduit penetration, installed under Divisions 26, 27 and 28, through fire rated construction.
- B. Provide fire rated assembly around electrical devices, panelboards, outlet boxes, back boxes, cabinets, and luminaires recessed in fire rated walls and ceilings. See Architectural drawings for locations of fire rated walls and ceilings.
- C. Verify barrier penetrations are properly sized and in suitable condition for application of materials.
- D. Provide masking and drop cloths to prevent contamination of adjacent surfaces by Fire Stopping materials. Clean spills of liquid components. Remove equipment, materials and debris, leaving area in undamaged, clean condition.

- E. Clean surfaces to be in contact with penetration seal materials of dirt, grease, oil, loose materials, rust, or other substances that may affect proper fitting, adhesion, or the required fire resistance. Cut and trim materials as required to neatly match edges of penetration.
- F. Comply with manufacturer's recommendations for temperature and humidity conditions before, during, and after installation of Fire Stopping.

END OF SECTION

SECTION 26 0500
GENERAL ELECTRICAL PROVISIONS

PART 1 - GENERAL

1.01 CONTRACT DOCUMENTS

- A. General electrical provisions apply to all work performed in Division 26, 27 & 28.
- B. The Contract Documents are complementary. What is required by any one, as affects this Division, shall be as binding as if repeated herein.
- C. Separation of this Division from other Contract Documents shall not be construed as segregation of the Work.
- D. Location of equipment on Drawings is approximate. Plan exact location with respect to site measurements and work of other trades prior to starting work. If measurements differ slightly, modify work. If measurements differ substantially, notify Architect and Owner's Authorized Representative prior to fabrication.
- E. Make minor changes in equipment connections and equipment locations as directed or required before rough-in without extra cost.
- F. Use of the word "Provide" shall be equivalent to "Furnish and Install."
- G. For products specified by listing one or more manufacturers, followed by "Similar to" and one manufacturer's model number, the following requirements apply:
 - 1. Approval of each listed manufacturer is contingent upon that manufacturer having a product which meets the specification, fits in the available space, and is comparable to the listed model.
 - 2. Electrical and space requirements indicated on drawings are based on the listed model and may not be suitable for all manufacturers listed. Provide revisions required to accommodate the model actually furnished.
- H. For products specified by listing one or more manufacturers, followed by a model number for each manufacturer, the following requirements apply:
 - I. Provide one of the listed model numbers or an approved substitution.
- J. Electrical and space requirements indicated on the Drawings are based on one of the listed models, and may not be suitable for all models listed. Provide revisions required to accommodate the model actually furnished.

1.02 DEFINITIONS

- A. Authority Having Jurisdiction (AHJ): The governmental agency or sub-agency which regulates the construction process.
- B. Owner's Authorized Representative (OAR): Owner's representative with authority to act on Owner's behalf.
- C. Provide: Equivalent to "Furnish and Install."

1.03 COORDINATION

- A. Reference drawings of other trades to avert possible installation conflicts. Should major changes from original drawings be necessary to resolve such conflicts, notify Architect and secure written approval and agreement on necessary adjustments before commencing work.
- B. Architectural drawings govern all other drawings. Reference Architectural drawings for door swings, counter heights and similar items affecting work before rough-in.
- C. Coordinate identification systems with other trades. All electrical systems shall use identical wiring, conduit, and equipment identification and regulatory signage.

1.05 SUBMITTALS AND SHOP DRAWINGS

- A. See Division 01
- B. Action Submittal Content
 - 1. Action submittal information not expressly required by the specifications will not be reviewed.
 - 2. Action submittal information shall be provided in sufficient detail to establish conformance with specified requirements. Where submitted literature includes multiple models, features, or options, the specific models, features, or options proposed shall be clearly indicated. Where a brief inspection shows that product data is not complete, the submittal will be rejected without review.
 - 3. Action submittal data shall be clear, concise, legible, and relevant. Where data is not properly organized and contains significant information that is not relevant, the submittal will be rejected without review.
 - 4. Action submittal requirements are listed in individual specification sections. The following definitions apply.
 - a. Materials List: Provide tabular list of materials including specification reference, specification product name, manufacturer, model/part number, and size and/or quantity where appropriate. Do not include supplemental data, except where specifically requested.
 - b. Catalog data: Manufacturer's standard product cut sheet.
 - c. Product Data: Detailed data including dimensions, weight, materials of construction, connections, and all other information needed to confirm that the product conforms to all requirements listed in the individual specification section.
 - d. Performance Data: Capacity, input, output, flow, etc. as required to confirm that the product meets the performance requirements scheduled in the Specifications or on the Drawings.
 - e. Wiring Diagrams: Power and control wiring diagrams.
 - f. Shop Drawings: Construction drawings of items manufactured specifically for this project including dimensions, construction details, weights, and additional information to identify the physical features of the system or piece of equipment.
 - g. Installation Instructions
 - h. Special Requirements Listed: Additional requirements indicated in individual specification sections.
- C. Delegated Design
 - 1. Delegated work will include but is not limited to the following:
 - a. Section 28 3100 - Fire Alarm.
 - 2. 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.
 - a. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Engineer.
 - 3. Delegated-Design Services Certification: In addition to shop drawings, product data, and other required submittals, submit digitally signed PDF electronic file, 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.
 - a. 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.
- D. Sustainable Design Requirements
 - 1. See Division 01 for procedures used to establish compliance with the US Green Building Council LEED prerequisites and credits established for the project.

1.06 QUALITY ASSURANCE

- A. All materials and equipment provided hereunder shall be installed and started in complete conformance with the manufacturer's recommendations.
- B. Asbestos products or equipment or materials containing asbestos shall not be used.
- C. Certify that each welder has passed the American Welding Society (AWS) qualification tests for the welding processes involved, and that certification is current.

1.07 DESIGN REQUIREMENTS

- A. Equipment and systems provided hereunder shall be rated to provide performance specified and scheduled on Drawings at the elevation of the project site.
- B. Materials and equipment provided hereunder shall be rated for the service conditions of the system to which they are connected including but not limited to temperature, pressure, and humidity.

1.08 CODES AND STANDARDS

- A. Applicable codes and standards shall determine minimum requirements for materials, methods, and labor practices not otherwise stated herein.
- B. Work shall comply with the Americans with Disabilities Act (ADA).

1.09 TEMPORARY SERVICES

- A. Provide in accordance with Division 01 as required for completion of work. Provide additional filters as required to keep areas clean during construction.
- B. Maintain existing systems operational. Owner will be responsible to operate and maintain existing equipment during the course of the project. However, any damage to existing equipment resulting directly from work under this Contract shall be repaired by the Contractor at no expense to Owner.

1.10 OPERATIONS AND MAINTENANCE MANUALS

- A. Prepare a digital file in Portable Document Format (PDF), clearly indexed with bookmarks for each item or product. Include a directory of all subcontractors and maintenance contractors with names, addresses, and telephone numbers, indicating the area of responsibility for each. Index bookmarks shall match submittal schedule and include any additional information required for operations and maintenance, whether in submitted schedule or not.
- B. Maintenance instructions shall indicate routine-type work with step-by-step instructions that should be performed to ensure long life and proper operations. Recommended frequency of performance shall also be included.
- C. Provide copy of approved submittal for each product included in manual
- D. Provide printed copy and electronic configuration files for all packaged equipment control systems furnished with equipment.
- E. Mark the model actually provided where the literature covers more than one model. Include four copies of all submittal data corrected to "as-built" conditions within the manual.
- F. Provide a composite summary table indicating each item of equipment listed in the operations and maintenance manual and its required maintenance and time period. This summary table shall be the first section in the O&M manual.
- G. Manual Content: Manuals shall contain complete information for each item of mechanical electrical or other operating equipment. Include as applicable:
 - 1. Manufacturer's instructions for installation, startup, operation, inspection, and maintenance
 - 2. Performance capacity
 - 3. Catalog data sheets
 - 4. Parts list
 - 5. Maintenance schedules

1.11 RECORD DRAWINGS

- A. Provide record "as-built" drawings in accordance with Division 1 requirements. Show all deviations from contract drawings and location of underground lines by accurate dimensions from building lines. Show depth of stub outs and underground lines. Dimension all concealed piping from column grids or building lines. Concealed raceways, that contain feeder cables, communication conduits that are 1.5-inch diameter or greater shall be dimensioned from column grids or building lines. Alternately, provide electronically using PDF markup of contract drawings.

1.12 DEMONSTRATION

- A. General: After installation is complete, demonstrate to Engineer and Owner's Authorized Representative satisfaction as being complete and operational and entirely in conformance with Contract Documents.
- B. Preparation: Prior to demonstration, submit check-off list indicating completeness of submittals and certificates of compliance for review to Owner's Authorized Representative. Operate completed system for one week. Verify that control verification is complete and verification report has been approved by Architect.
- C. Arrange for demonstration with Owner, Engineer, required factory technicians, and installer at least one week in advance of demonstration.

1.13 TRAINING

- A. Instruct Owner in proper operation and maintenance of equipment and systems. Instruction shall generally include topics listed in manufacturer's operations and maintenance manual. Operator instructions shall cover all aspects of manual, automatic, and safety controls. Contractor shall also instruct the Owner in the general configuration of systems and location of equipment and components.
- B. Furnish competent qualified technicians knowledgeable in the building electrical and lighting systems and equipment provided for this project for a minimum of 4 hours on-site to instruct Owner in operation and maintenance of systems and equipment. This figure does not include additional training noted under individual specification sections. Contractor shall keep a log of this instruction including date, times, subjects, and those present and shall present such log when requested by Engineer. Contractor shall coordinate training with Owner's Project Manager and provide a schedule for training minimum two-weeks prior to Substantial Completion. All training shall be complete 30-days after Substantial Completion.
- C. Contractor shall furnish training by equipment manufacturers in addition to training described in this section where specifically listed in other sections. Contractor shall schedule training with Owner's Project Manager minimum 48-hours prior to training session. Equipment shall be fully operational prior to scheduling training session. Manufacturer's field start-up, adjustment, and service will not fulfill manufacturer's training requirement.

1.14 WARRANTY

- A. Warrant all Work included in the Specification for a period of one year from the date of substantial completion, under provisions of Division 1.
- B. During warranty period, remedy without delay or expense to Owner any defects providing, in judgement of Engineer, that such defects are not a result of misuse or abuse on part of Owner.
- C. Warrant that all equipment and installations are in compliance with OSHA regulations.

PART 2 - PRODUCTS

2.01 PRODUCTS AND MATERIALS

- A. All materials employed in permanent construction shall be new, full weight, in first class condition, and suitable for space provided. All similar equipment and materials shall be of one manufacturer.
- B. Equipment used as the basis of design is scheduled on Drawings or designated in product specifications. If Contractor chooses to use equipment that is not the basis of design, Contractor is responsible for all re-design and construction costs associated with variations in arrangement,

dimension, or capacity. Such work may include, but is not limited to, changes to facility structure or dimensions and revisions to associated mechanical and electrical systems needed to provide equal system performance and maintainability.

2.02 ELECTRICAL EQUIPMENT

- A. Electrical Disconnect Switch: Electrical disconnect switches specified for mechanical equipment shall conform to OSHA Lock-out/Tag-out requirements.
- B. All electrical equipment shall be listed as approved for its application by the Underwriters Laboratory or other testing agency approved by the State of Oregon Electrical and Elevator Board. Approval indicates agency meets testing standard requirements for electrical safety required by Oregon Revised Statutes 479.510 through 479.855 and Oregon Administrative Rules.
- C. Enclosure: Provide the following electrical equipment enclosure types.
 - 1. NEMA 1: Dry, enclosed locations where the ambient temperature will not be outside of the equipment temperature ratings.
 - 2. NEMA 12: Enclosed mechanical spaces equipped with floor drains where dripping or splashing may occur and where the ambient temperature will not be outside of the equipment temperature ratings.
 - 3. NEMA 3R: Outdoors or in spaces where sustained water spray is possible.
 - 4. NEMA 3R: with Temperature Control: Outdoors or in unconditioned spaces where ambient temperatures will be outside of the equipment temperature ratings.
 - 5. NEMA 4X: Outdoors or in spaces that are corrosive environments.

2.03 EQUIPMENT CONNECTIONS

- A. Provide a complete electrical connection for all items of equipment including incidental wiring, materials, devices and labor necessary for a complete operating system. The location and method for connection to each item of equipment shall be verified prior to rough-in. The voltage and phase of each item of equipment shall be checked prior to connecting. Motor rotations shall be made in the proper direction. Pump motors are not to be test run until liquid is in the system and proper lubrication to all bearings in unit is checked.
- B. Conduit, wire and circuit breaker sizes for mechanical and similar equipment are based on the equipment ratings of one manufacturer. The equipment actually furnished may have different electrical characteristics. Conduit, wire, and circuit breakers shall not be ordered or installed until exact electrical requirements are obtained. The Contractor is responsible for this coordination.

PART 3 - EXECUTION

3.01 ACCESS TO EQUIPMENT AND ACCESSORIES

- A. Install equipment with sufficient access for service. Where not conveniently accessible by other means, provide adequately sized access doors for junction & pull boxes, relays & power packs, and all other electrical equipment requiring access for removal or maintenance. Type, size and exact location of access doors shall be coordinated with Architect prior to work.
- B. Provide clearances for maintenance access as indicated on Drawings or as recommended by manufacturer. If access requirements shown on Drawings conflict with manufacturer's recommendations, provide larger clearance of the two.
- C. If equipment location shown on Drawings does not allow required access, notify Architect prior to start of work.
- D. Apply and install all items in accordance with manufacturer's written instructions. Refer conflicts between the manufacturer's instructions and the contract drawings and specifications to Architect for resolution prior to starting work.

3.02 ARRANGEMENT AND INSTALLATION OF ELECTRICAL EQUIPMENT AND CONDUIT

- A. Minor Conduit: Small diameter conduit runs from receptacles, lighting, equipment, and similar minor services are generally not shown but must be provided. Contractor is responsible to provide all such minor conduit where needed to maintain electrical spaces clean and neat and to allow full equipment function and maintenance.

- B. Work in Existing Building: Cut required openings through existing masonry and reinforced concrete using diamond core drills. Use of pneumatic hammer type drills, impact type electric drills, and hand or manual hammer type drills, will be permitted only with approval of the Owner's Authorized Representative. Locate openings that will least affect structural slabs, columns, ribs or beams. Refer to the Architect for determination of proper design for openings through structural sections and obtain layout approval prior to cutting or drilling into structure. After Architect's approval, carefully cut opening through construction no larger than absolutely necessary for the required installation.
- C. Inaccessible Equipment
 - 1. Where the Owner's Authorized Representative determines that the Contractor has installed equipment not conveniently accessible for operation and maintenance, equipment shall be removed and reinstalled or remedial action performed as directed at no additional cost to the Owner.
 - 2. The term "conveniently accessible" is defined as capable of being reached without the use of ladders, or without climbing or crawling under or over obstacles such as motors, fans, pumps, belt guards, transformers, high voltage lines, piping, and ductwork.

3.03 EXISTING EQUIPMENT REUSED OR RELOCATED

- A. All equipment designated as existing or furnished by Owner shall be cleaned and repaired before reinstallation. Any items requiring repair shall be brought to the attention of the construction manager before the item is reinstalled. Damage not brought to the attention of the construction manager shall be deemed the result of reinstallation of the item and shall be repaired without expense to the Owner.

3.04 ELECTRICAL SYSTEMS FIRESTOPPING

- A. Do not cover firestop installations until they are examined by the Authority Having Jurisdiction, if required.
- B. Install firestopping in accordance with manufacturer's recommendations and conditions of product UL listing.

3.05 CLEANING SYSTEMS

- A. General: After all equipment, conduits and cable tray are installed, system shall be thoroughly cleaned. Remove all nonessential stickers and labels from equipment or fixtures. Clean all light fixture lenses. Clean interior of conduit systems prior to installation of wiring.
- B. Repair or replace any discolorations or damage to systems, building finish, or furnishings resulting from Contractor's failure to properly clean system.

3.06 START UP

- A. The Electrical Contractor shall be responsible for proper operation of all systems and shall coordinate startup procedures, calibration and system checkout. System operational problems shall be diagnosed and corrected as required for system operation prior to Substantial Completion inspection.
- B. Start equipment in accordance with manufacturer's recommendations and under manufacturer's supervision where required. Ensure that associated breakers, relays, , electrical overloads, and other devices intended to protect the equipment are installed and functional prior to startup.

3.07 EXTRA STOCK

- A. Provide extra stock, as described in individual sections, to Owner in accordance with Division 1.

END OF SECTION

**SECTION 26 0501
ELECTRICAL DEMOLITION**

PART 1 - GENERAL

1.01 SCOPE

- A. It is the intent of these documents to provide the necessary information and adjustments to the electrical system required to meet Code and accommodate installation of the new work.
- B. Contractor shall coordinate with the Owner so that work can be scheduled not to interrupt operations, normal activities, building access, access to different areas. The Owner will cooperate to the best of their ability to assist in a coordinated schedule but will remain the final authority as to time of work permitted.

1.02 EXISTING CONDITIONS

- A. The locations of existing utilities and equipment are shown in an approximate way only and have not been independently verified by the Owner or its representative. The Contractor shall determine the exact location of all existing utilities before commencing work and agrees to be fully responsible for any and all damages which might be occasioned by the Contractor's failure to exactly locate and preserve any and all utilities and equipment. Replace damaged items with new material to match existing. Promptly notify Owner if utilities are found which are not shown on the Drawings.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. All materials accumulated during the demolition process are the Owner's property and shall be removed from the job site as directed by the Owner.

PART 3 - EXECUTION

3.01 DEMOLITION

- A. Remove all existing fixtures, clocks, switches, receptacles, and other electrical equipment and devices and associated wiring from walls, ceilings, floors, and other surfaces scheduled for remodeling, relocation, or demolition unless specifically shown as retained or relocated on the Drawings.
- B. Disconnect all existing mechanical equipment scheduled for removal, relocation or abandonment. See mechanical drawings for scope of work. Remove abandoned cables and unusable raceways. Relabel panels and motor control centers to reflect changes.
- C. Maintain electrical continuity of all existing systems. Remove or relocate electrical boxes, conduit, wiring, equipment, fixtures, etc. as may be encountered in removed or remodeled areas in the existing construction affected by this work. Wiring which serves usable existing outlets shall be removed and restored clear of the construction or demolition. If existing junction boxes will be made inaccessible, or if abandoned outlets serve as feed through boxes for other existing electrical equipment which is being retained, new conduit and wire shall be provided to bypass the abandoned outlets. If existing conduits pass through partitions or ceiling which are being removed or remodeled, new conduit and wire shall be provided to reroute clear of the construction or demolition and maintain service to the existing load.
- D. Extend circuiting and devices in all existing walls to be furred out.
- E. Existing electrical outlets and light fixtures are denoted by dotted or dashed lines. Verify exact location of existing electrical outlets and light fixtures in the field. Only partial existing electrical shown. Locations of items shown on the Drawings as existing are partially based on as built and other drawings which may contain errors. The contractor shall verify the accuracy of the information shown prior to bidding and provide such labor and material as is necessary to accomplish the intent of the contract documents.
- F. Remove all abandoned wiring to leave site clean.

- G. Keep outages to occupied areas to a minimum and prearrange all outages with the Owner's representative. Requests for outages shall state the specific dates and hours and the maximum durations, with the outages kept to these specific dates and hours and the maximum durations. This Contractor will be liable for any damages resulting from unscheduled outages or for those not confined to the preapproved times. Outages shall take place at times when the facility is not in operation or occupied by non-essential personnel. Include all costs for overtime labor as necessary to maintain electrical services in the initial bid proposal. Temporary wiring and facilities, if used, shall be removed and the site left clean before final acceptance. Requests for outages must be submitted at least (5) days prior to intended shutdown time.
- H. No circuit breaker or disconnects shall be turned off without prior approval from Owner. Coordinate with the Owner's representative responsible for the area or equipment affected for any electrical interruptions which affect the operation of the remaining portions of the facility.
- I. Verify with the General Contractor a location for storage of materials, supplies, tools, rubbish, etc. prior to start of work.

END OF SECTION

SECTION 26 0519

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Copper building wire rated 600 V or less.
 - 2. Connectors, splices, and terminations rated 600 V and less.

1.03 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Product Schedule: Indicate type, use, location, and termination locations.

1.04 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Field quality-control reports.

PART 2 - PRODUCTS

2.01 COPPER BUILDING WIRE

- A. Description: Flexible, insulated and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.
- B. 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:
 - 1. American Bare Conductor.
 - 2. Cerro Wire LLC.
 - 3. General Cable Technologies Corporation.
 - 4. Okonite Company (The).
 - 5. Southwire Company.
- C. Standards:
 - 1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
 - 2. RoHS compliant.
 - 3. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."
- D. Conductors: Copper, complying with ASTM B 3 for bare annealed copper and with ASTM B 8 for stranded conductors.
- E. Conductor Insulation:
 - 1. Type THHN and Type THWN-2: Comply with UL 83.
 - 2. Type XHHW-2: Comply with UL 44.
- F. Ninety-eight percent conductivity, minimum.
- G. Branch Circuit Wiring: Conductors smaller than No. 12 AWG for power system branch circuits not permitted.
- H. Motor control wires shall be No. 14 minimum.

2.02 CONNECTORS AND SPLICES

- A. Description: Factory-fabricated connectors, splices, and lugs of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.

- B. 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:
 1. 3M Electrical Products.
 2. AFC Cable Systems.
 3. Gardner Bender.
 4. Ideal Industries, Inc.
 5. Burndy
 6. Thomas & Betts Corporation.
- C. Jacketed Cable Connectors: For steel and aluminum jacketed cables, zinc die-cast with set screws, designed to connect conductors specified in this Section.
- D. Lugs: One piece, seamless, designed to terminate conductors specified in this Section.
 1. Material: Copper.
 2. Type: Two hole with standard barrels.
 3. Termination: Compression.

PART 3 - EXECUTION

3.01 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders: Copper. Stranded conductors only.
- B. Branch Circuits: Copper. Stranded conductors only.
- C. Power-Limited Fire Alarm and Control: Solid for No. 14 AWG and smaller.

3.02 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type THHN/THWN-2, single conductors in raceway.
- B. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN/THWN-2, single conductors in raceway.
- C. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN/THWN-2, single conductors in raceway.
- D. Branch Circuits Installed below Raised Flooring: [Type THHN/THWN-2, single conductors in raceway] [Metal-clad cable, Type MC].

3.03 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.
- B. Use no wire smaller than No. 12 AWG for power and lighting circuits and no smaller than No. 16 AWG for control wiring.
- C. Use No 10 AWG conductors for 20 amperes, 120-volt branch circuit home runs longer than 100 feet, and for 20 ampere, 277-volt branch circuit home runs longer than 200 feet. Neutral conductor shall be sized the same as corresponding phase conductors.
- D. Metal-clad (MC) cable permitted for final connection to one light fixture from a single junction box. Daisy chaining fixtures or junction boxes with MC cable is not permitted.
- E. Provide dedicated neutral conductor with each branch circuit, do not use a shared neutral conductor between phases unless specifically requested or directed.
- F. For remodel work or where shared neutrals are used by equipment such as system furniture, provide a breaker handle tie as required for the phases sharing the neutral conductor.
- G. Conductor length for parallel feeders shall be identical.
- H. Complete raceway installation between conductor and cable termination points according to Section 26 05 33 – Raceways and Boxes for Electrical Systems prior to pulling conductors and cables.

- I. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- J. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- K. Couplings and conduit connectors shall have pre-insulated bushings in place prior to pulling wires.
- L. Splice only in accessible junction or outlet boxes. Splice in feeders and services are not permitted. Splice or taps in branch circuits permitted only in junction boxes where circuits divide.
- M. Install exposed cables parallel and perpendicular to surfaces of exposed structural members and follow surface contours where possible.
- N. Lace or clip groups of feeder conductors at distribution centers, pullboxes, and wireways.
- O. Provide copper grounding conductors and straps. A ground wire shall be pulled through conduits and used as the equipment grounding conductor.
- P. Wire and cable shall be brought to the job site in the original containers bearing the U.L. label.
- Q. Installing wires of different voltage systems in the same raceway, box, gutter or other enclosure is prohibited.
- R. Radius of cable bends shall not be less than ten times the outer diameter of the cable.

3.04 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
 - 1. Use oxide inhibitor in each splice, termination, and tap for aluminum conductors.
- C. Follow manufacturer's instructions using manufacturer's recommended tools.
- D. Stripping Insulation: Carefully strip, avoid nicking conductor. No "ringing".
- E. Design: Connectors shall be designed and approved for the purpose used. Connectors between aluminum and copper shall be listed "AL/CU" for the purpose of preventing electrolytic action.
- F. Bare Connectors and Conductor Free Ends: Wrap with insulating rubber or friction tape to equivalent insulation of wire.
- G. Ground Continuity to Metallic Surfaces: Remove any paint coating and polish surface beneath connection.
- H. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches of slack.
- I. No splices or taps permitted in feeder branch circuiting terminating at a single outlet.
- J. Conductor and cable copper shall not be reduced at the terminal for making connections.

3.05 IDENTIFICATION

- A. Identify and color-code conductors and cables according to Section 26 05 53 - Identification for Electrical Systems.
- B. Color-coding for Phase- and Voltage-Level Identification, 600 V or Less: Use colors listed below for ungrounded service, feeder, and branch-circuit conductors.
 - 1. Color shall be factory applied integral pigmentation or field applied for sizes larger than No. 6 AWG if authorities having jurisdiction permit. Where field applied, apply colored plastic tape in spiral half-lap over exposed conductor portions in manholes, boxes, panels, switchboards, and other enclosures.

2. Colors for 208/120-V circuits:
 - a. Phase A: Black.
 - b. Phase B: Red.
 - c. Phase C: Blue.
 - d. Neutral: White with corresponding phase color stripe.
 3. Color for Equipment Grounds: Green
 4. Color for Isolated Grounds: Green with yellow stripe.
- C. Identify each spare conductor at each end with identity number and location of other end of conductor and identify as spare conductor.

3.06 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Division 07.

3.07 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors for compliance with requirements.
 2. Perform each of the following visual and electrical tests:
 - a. Inspect exposed sections of conductor and cable for physical damage and correct connection according to the single-line diagram.
 - b. Test bolted connections for high resistance using one of the following:
 - 1) A low-resistance ohmmeter.
 - 2) Calibrated torque wrench.
 - c. Inspect compression-applied connectors for correct cable match and indentation.
 - d. Inspect for correct identification.
 - e. Inspect cable jacket and condition.
 - f. Continuity test on each conductor and cable.
 - g. Uniform resistance of parallel conductors.
 - h. Perform insulation-resistance test on each conductor with respect to ground and adjacent conductors. Applied potential shall be 500 volts dc for 300-volt rated cable and 1000 volts dc for 600-volt rated cable. Test duration shall be one minute.
- B. Cables will be considered defective if they do not pass tests and inspections.
- C. Prepare test and inspection reports to record the following:
1. Procedures used.
 2. Results that comply with requirements.
 3. Results that do not comply with requirements, and corrective action taken to achieve compliance with requirements.

END OF SECTION

SECTION 26 0533
RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Metal conduits and fittings.
 - 2. Boxes, enclosures, and cabinets.
 - 3. Handholes and boxes for exterior underground cabling.

1.03 DEFINITIONS

- A. GRC: Galvanized rigid steel conduit.
- B. IMC: Intermediate metal conduit.
- C. EMT: Electric metallic conduit.

1.04 ACTION SUBMITTALS

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.
- B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details.

PART 2 - PRODUCTS

2.01 METAL CONDUITS AND FITTINGS

- A. Metal Conduit:
 - 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. Allied Tube & Conduit; a part of Atkore International.
 - b. Calconduit.
 - c. Thomas & Betts Corporation; A Member of the ABB Group.
 - d. Western Tube and Conduit Corporation.
 - e. Wheatland Tube Company.
 - 2. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 - 3. GRC: Comply with ANSI C80.1 and UL 6.
 - 4. EMT: Comply with ANSI C80.3 and UL 797.
- B. Metal Fittings:
 - 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. Allied Tube & Conduit; a part of Atkore International.
 - b. O-Z/Gedney; a brand of Emerson Industrial Automation.
 - c. Thomas & Betts Corporation; A Member of the ABB Group.
 - d. Western Tube and Conduit Corporation.
 - e. Wheatland Tube Company.
 - 2. Comply with NEMA FB 1 and UL 514B.
 - 3. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 - 4. Fittings, General: Listed and labeled for type of conduit, location, and use.
 - 5. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 1203 and NFPA 70.

6. Fittings for EMT:
 - a. Material: Steel.
 - b. Type: Setscrew.
 7. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
 8. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch, with overlapping sleeves protecting threaded joints.
- C. Joint Compound for IMC, GRC, or ARC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.02 BOXES, ENCLOSURES, AND CABINETS

- 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:
1. Crouse-Hinds, an Eaton business.
 2. FSR Inc.
 3. Hoffman; a brand of nVent.
 4. Hubbell Incorporated.
 5. O-Z/Gedney; a brand of Emerson Industrial Automation.
 6. Wiremold / Legrand.
- B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
- C. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.
- D. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.
- E. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.
- F. Metal Floor Boxes:
1. Material: Cast metal.
 2. Type: Fully adjustable.
 3. Shape: Rectangular.
 4. Listing and Labeling: Metal floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- G. Nonmetallic Floor Boxes: Nonadjustable, rectangular.
1. Listing and Labeling: Nonmetallic floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- H. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb. Outlet boxes designed for attachment of luminaires weighing more than 50 lb shall be listed and marked for the maximum allowable weight.
- I. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- J. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, galvanized, cast iron with gasketed cover.
- K. Box extensions used to accommodate new building finishes shall be of same material as recessed box.
- L. Device Box Dimensions: 4 inches square by 2-1/8 inches deep minimum.
- M. Gangable boxes are allowed.

PART 3 - EXECUTION

3.01 RACEWAY APPLICATION

- A. Outdoors: Apply raceway products as specified below unless otherwise indicated:
1. Exposed Conduit: GRC.
 2. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.

- B. Indoors: Apply raceway products as specified below unless otherwise indicated:
 - 1. Exposed, Not Subject to Physical Damage: EMT.
 - 2. Exposed, Not Subject to Severe Physical Damage: EMT.
 - 3. Concealed in Ceilings and Interior Walls and Partitions: EMT.
 - 4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
 - 5. Damp or Wet Locations: GRC.
- C. Minimum Raceway Size: 3/4-inch trade size for branch circuits, 1-inch for data.
- D. Raceway Fittings: Compatible with raceways and suitable for use and location.
 - 1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
 - 2. EMT: Use setscrew, steel fittings. Comply with NEMA FB 2.10.
 - 3. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.
- E. Install nonferrous conduit or tubing for circuits operating above 60 Hz. Where aluminum raceways are installed for such circuits and pass through concrete, install in nonmetallic sleeve.
- F. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.
- G. Install surface raceways only where indicated on Drawings.

3.02 INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.
- B. Do not install raceways or electrical items on any "explosion-relief" walls or rotating equipment.
- C. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- D. Complete raceway installation before starting conductor installation.
- E. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.
- F. Make bends in raceway using large-radius preformed ells. Field bending shall be according to NFPA 70 minimum radii requirements. Use only equipment specifically designed for material and size involved.
- G. Conceal conduit within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.
- H. Support conduit within 12 inches of enclosures to which attached.
- I. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.
- J. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.
- K. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch trade size and insulated throat metal bushings on 1-1/2-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.
- L. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.

- M. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.
- N. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.
- O. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.
- P. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.
- Q. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.
- R. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.
- S. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.
- T. Locate boxes so that cover or plate will not span different building finishes.
- U. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.
- V. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

3.03 FIRESTOPPING

- A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Division 07.

3.04 PROTECTION

- A. Protect coatings, finishes, and cabinets from damage and deterioration.
 - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
 - 2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION

SECTION 26 0553
IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Equipment Identification Nameplates
 - 2. Wiring Device Identification
 - 3. Miscellaneous Identification Products
 - 4. Pull box and junction box identification

1.03 RELATED SECTIONS

- A. Division 01, General Requirements
- B. Section 26 0533 – Raceways and Boxes for Electrical Systems
- C. Section 26 2416 – Panelboards
- D. Section 26 2726 – Wiring Devices
- E. Section 26 2913 – Motor Circuit Disconnects

1.04 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for electrical identification products.
- B. Identification Schedule: For each piece of electrical equipment and electrical system components to be an index of nomenclature for electrical equipment and system components used in identification signs and labels. Use same designations indicated on Drawings.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. Comply with ASME A13.1 and IEEE C2.
- B. Comply with NFPA 70.
- C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- D. Comply with ANSI Z535.4 for safety signs and labels.
- E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.
- F. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
 - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.02 EQUIPMENT IDENTIFICATION NAMEPLATES

- A. Engraved, Three-layer, Laminated Acrylic or Melamine Nameplate: Drilled or punched for mechanical fasteners. White letters on black background, except emergency equipment nameplates shall have white letters on red background. Beveled edges with minimum letter height of 1/2-inch unless otherwise noted.

2.03 WIRING DEVICE IDENTIFICATION

- A. Self-adhesive vinyl labels, machine printed with black 1/8 inch high text on clear background, except emergency wiring devices shall have black letters on red background, by thermal transfer or equivalent process.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

3.02 INSTALLATION

- A. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project. Labeling shall be reviewed and approved by the Owner's Authorized Representative.
- B. Install identifying devices before installing acoustical ceilings and similar concealment.
- C. Verify identity of each item before installing identification products.
- D. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and operation and maintenance manual.
- E. Apply identification devices to surfaces that require finish after completing finish work.
 - 1. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on 1-1/2-inch-high label; where two lines of text are required, use labels 2 inches high.
- F. Self-Adhesive Vinyl Tape: Secure tight to surface at a location with high visibility and accessibility.
 - 1. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding.
- G. Tape and Stencil: Comply with requirements in painting Sections for surface preparation and paint application.

3.03 IDENTIFICATION SCHEDULE

- A. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.
- B. Junction Box Identification: Identify each junction box with complete system description, including system voltage, panel, and circuits contained within.
 - 1. Acceptable Identification Methods: Neat hand lettering with permanent black marker, machine printed, adhesive vinyl labels, or engraved nameplates.
 - 2. Acceptable Locations:
 - a. In concealed locations: Locate identification on outside of junction box cover.
 - b. In exposed locations: Locate identification on inside of junction box cover.
 - 3. Fire Alarm Junction Boxes: Box covers shall be painted red and labeled "FIRE ALARM" prior to installation.
- C. Wiring Device Plate Identification: Apply machine printed, self-adhesive vinyl labels at bottom center of device plate for single gang and multiple gang devices.
 - 1. Label shall provide branch circuit identification.
 - a. Example: "B-16" indicating panel "B" and circuit #16.
- D. Equipment Identification Labels:
 - 1. Indoor Equipment: Laminated acrylic or melamine plastic sign.
 - 2. Install nameplates for equipment, including but not limited to, the following:
 - a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be in the form of an engraved, laminated acrylic or melamine label.
 - b. Enclosures and electrical cabinets.
 - c. Disconnect switches.
 - d. Panelboards

3. Provide the following information on each nameplate:
 - a. Equipment name/tag:
 - 1) Matching the designation indicated on the contract documents, or identifying the load controlled or function of the equipment where no specific tag is shown on the contract documents unless otherwise noted.
 - b. Equipment operating voltage, phase, wiring configuration and ampacity
 - 1) Example: 480V/3PH/4W/225A
 - c. Source of power supply, including circuit number:
 - 1) Example: FED FROM 4NL1-3

END OF SECTION

SECTION 26 0924
DIGITAL LIGHTING CONTROL EQUIPMENT

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes a networked lighting control system comprised of the following components:
 - 1. System Backbone and Integration Equipment
 - a. Digital Time Clock
 - 2. Wired Network Devices
 - a. Wall Stations
 - b. Auxiliary Input/Output Devices
 - c. Occupancy and Photocell Sensors
 - d. Wall Switch Sensors
 - e. Power Packs and Secondary Packs
 - 3. The networked lighting control system shall meet all the characteristics and performance requirements specified herein.
 - 4. The contractor shall provide, install and verify proper operation of all equipment necessary for proper operation of the system specified herein and as shown on applicable drawings.

1.02 RELATED SECTIONS

- A. Section 26 2726 – Wiring Devices
- B. Section 26 5100 – Lighting Fixtures

1.03 REFERENCES

- A. American Nation Standards Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE).
- B. International Organization for Standards (ISO).
- C. National Electrical Manufacturers Association (NEMA)
- D. Underwriters Laboratories, Inc. (UL)
 - 1. 916 – Energy Management Equipment
 - 2. 924 – Emergency Lighting and Power Equipment

1.04 SYSTEM DESCRIPTION & OPERATION

- A. Control of the following areas indicated on the Drawings:
 - 1. Interior spaces without exterior windows, including but not limited to open/private offices, conference room and meeting rooms.
 - a. Lighting in spaces shall be controlled by occupancy sensors located within the space. Upon detection, lights will turn ON to 50% output and turn OFF after 20 minutes of no occupancy detection.
 - 1) Auxiliary relay in space shall provide contact closure to mechanical system for control of equipment when space is occupied. Coordinate connection with mechanical.
 - b. Override control lighting in space shall be capable of switching lighting ON/OFF and raise/lower lighting level in space.
 - c. Set high-end trim for lighting to 90% output. Verify high-end trim setting with Owner prior to programming and modify as required.
 - 2. Interior spaces with exterior windows, including, but not limited to, open/private offices, conference rooms and meeting rooms.
 - a. Manual input at wall mounted control station shall be required to turn ON lighting in the space and lighting will turn OFF after 20 minutes of no occupancy detection. Set high-end trim for lighting to 90% output. Verify high-end trim setting with Owner prior to programming and modify as required.
 - 1) Auxiliary relay in space shall provide contact closure to mechanical system for control of equipment when space is occupied. Coordinate connection with Mechanical.

- b. Where daylighting zones are indicated on drawings, lighting located within zones shall be continuously dimmed according to the light level measured at the photocell within the space.
 - 1) Target footcandle level at [+30"] AFF in daylighting zone shall be [30] fc. Verify target light level with Owner prior to programming and modify as required.
 - c. Override control of lighting in space shall be capable of switching lighting ON/OFF and raise/lower lighting level within space.
3. Corridors and other Circulation areas, excluding enclosed stairwells.
- a. Normally Occupied Hours:
 - 1) Scheduled operation shall turn lights ON in area to 30% output. Upon occupancy detection, lighting output shall increase to 90% output and return to 30% after 15 minutes of no occupancy detection. Verify high-end trim with Owner prior to programming and modify as required.
 - a) Time schedule operation shall be lights ON at 6AM / OFF at 6PM. Verify schedule with Owner prior to programming and modify as required.
 - 2) Where daylighting zones are indicated on drawings, lighting located within zones shall be continuously dimmed according to the light level measured at the photocell within the space.
 - a) Target footcandle level in at +30" AFF in daylighting zones shall be 15 fc. Verify target light level with Owner prior to programming and modify as required.
 - b. Normally Unoccupied Hours:
 - 1) Lighting in zone will be controlled by local occupancy sensors located within the zone. Upon detection lights will turn ON to 90% output and turn OFF after 15 minutes of no occupancy detection. Verify high-end trim with Owner prior to programming and modify as required.
 - c. Lighting in circulation areas shall remain ON at 30% output when occupancy is detected in any space within the building, including but not limited to Break rooms, Conference and Meeting rooms, Open and Private Offices
4. Remaining areas that are not indicated above are intended to have standalone control utilizing digital lighting control components unless otherwise noted.
- a. These areas shall have auto ON/auto OFF control of lighting using local switches and occupancy sensors within their respective spaces, unless otherwise noted.
 - b. Occupancy sensors in remaining areas shall have a timeout period of 20 minutes.

1.05 ACTION SUBMITTALS

- A. Submittals prior to commencing Work:
 - 1. When Manufacturers' product information applies to a product series rather than a specific product, the data specifically applicable to the project shall be highlighted or clearly indicated by other means. Each submitted piece of literature and drawings shall clearly reference the pertinent specification or drawing.
 - 2. Control System Hardware:
 - a. Provide a complete bill of materials of control system hardware indicating quantity, manufacturer, model number, and technical data. Technical data shall include performance curves, product specifications sheets, and installation maintenance instructions.
 - b. Network Communication Diagrams: Provide schematic diagram showing all components, communications cabling, and termination points. Identify power requirements and power source for each device. Identify equipment each device is controlling. Show termination numbers.
 - c. Provide plans indicating locations of all control hardware.
 - d. Hardware and Software Operation Manuals and any software required for updates or changes to the system.
 - e. Provide digital copies of programming manuals for each configurable device furnished.

3. Controlled Systems:
 - a. Provide an instrumentation list for each control zone including all controlled system elements in table format. Tables to show element name, type of device, manufacturer, model number, and product data sheet number.
 - b. Provide a schematic wiring diagram for each controlled system. Label all elements. Label all terminals.
 - c. Provide a mounting, wiring, and routing plan-view drawing.
 - d. Provide a complete description of all devices for each control zone including sequence of operation and configuration parameters.
 - e. Start-up and Verification: Provide example Contractor Startup and Verification Worksheet.
 - f. Submittal name and certification for Manufacturers Field Start-up Technician.
- B. Closeout Submittals
 1. Fully executed Contractor Startup and Verification Worksheet demonstrating system installation and operation in accordance with requirements specified herein. Worksheet must be submitted prior to Substantial Completion.
 2. Record documents shall include the following.
 - a. Project record drawings. Project record drawings will be as-built versions of the Shop Drawings in digital PDF format.
 - b. Provide copy of approved start-up and verification worksheets.

1.06 QUALITY ASSURANCE

- A. Product Qualifications
 1. System electrical components shall be listed or recognized by a national recognized testing laboratory (e.g., UL, ETL, or CSA) and shall be labeled with required markings as applicable.
 2. System shall be listed as qualified under DesignLights Consortium Networked Lighting Control System Specification V4.0.
 3. System luminaires and controls are certified by manufacturer to have been designed, manufactured and tested for interoperability.
 4. All components shall be subjected to 100% end of line testing prior to shipment to the project site to ensure proper device operation.
 5. All components and the manufacturing facility where product is manufactured must be RoHS compliant.
- B. Installation and Startup Qualifications
 1. System startup shall be performed by qualified personnel approved or certified by the manufacturer.
- C. Service and Support Requirements
 1. Phone Support: Toll free technical support shall be available.
 2. Remote Support: The bidder shall offer a remote support capability.
 3. Onsite Support: The bidder shall offer onsite support that is billable at whole day rates.
 4. Service Contract: The bidder shall offer a Service Contract that packages phone, remote, and onsite support calls for the project. Response times for each type of support call shall be indicated in the terms of the service contract included in the bid package.

1.07 COORDINATION

- A. Coordinate lighting control components to form an integrated interconnection of compatible components.
- B. Coordinate lighting controls with Building Automation System through hardwired auxiliary relay outputs. Reference mechanical drawings for equipment requiring.
- C. The installing contractor shall be responsible for a complete and functional system in accordance with all applicable local and national codes.

1.08 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace components of lighting controls that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Software: Failure of input and output to execute switching or dimming commands.
 - b. Failure of modular relays to operate under manual or software commands.
 - c. Damage of electronic components due to transient voltage surges.
 - 2. Warranty Period:
 - a. For Control Hardware Components: [**Five**] <Insert number> years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. nLight Network Control System – Basis of Design.
- B. Wattstopper Digital Lighting Management (DLM) System.
- C. Or approved equivalent.

2.02 SYSTEM REQUIREMENTS

- A. System shall have an architecture that is based upon three main concepts:
 - 1. Intelligent lighting control devices.
 - 2. Standalone lighting control zones.
- B. Intelligent lighting control devices shall consist of one or more basic lighting control components; occupancy sensors, photocell sensors, relays, dimming outputs, manual switch stations, and manual dimming stations. Combining one or more of these components into a single device enclosure should be permissible so as to minimize overall device count of system.
- C. Where required the system must interface directly with intelligent LED luminaires such that only CAT-5/6 cabling is required to interconnect luminaires with control components such as sensors and switches.
- D. Intelligent lighting control devices shall communicate digitally, require <4mA of current to function (Graphic WallPod excluded), and possess at least two RJ-45 connectors.
- E. Lighting control zones shall consist of one or more intelligent lighting control components, be capable of stand-alone operation, and be capable of being connected to a higher-level network backbone.
- F. Devices within a lighting control zone shall be connected with CAT-5/6 low voltage cabling, in a daisy-chain fashion, and in any order.
 - 1. Provide blue thermoplastic jacket color for category cabling serving digital lighting control equipment. Confirm jacket color with Owner prior to installation.
- G. Lighting control zone shall be capable of automatically configuring itself for default operation without any start-up labor required.
- H. Individual lighting zones must continue to provide a user defined default level of lighting control in the event of a system communication failure with the backbone network or the management software becoming unavailable.
- I. Power for devices within a lighting control zone shall come from either resident devices already present for switching (relay device) or dimming purposes, or from the network backbone. Standalone “bus power supplies” shall not be required in all cases.
- J. All switching and dimming for a specific lighting zone shall take place within the devices located in the zone itself (i.e. not in a remotely located devices such as panels) to facilitate system robustness and minimize wiring requirements.
- K. System shall have a web-based software management program that enables remote system control, status monitoring, and creation of lighting control profiles.

- L. Individual lighting zones shall be capable of being segmented into several channels of occupancy, photocell, and switch functionality for more advanced configurations and sequences of operation.
- M. Devices located in different lighting zones shall be able to communicate occupancy, photocell, and switch information via the wired backbone.
- N. System shall be capable of operating a lighting control zone according to several sequences of operation. Note operating modes should be utilized only in manners consistent with local energy codes.
 - 1. Manual-On / Auto-Off.
 - a. Pushing a switch will turn lights on.
 - b. Zones with occupancy and/or photocell sensors turn lights off or dim when vacancy or sufficient daylight is detected.
 - 2. Auto-On / Predictive Off.
 - a. Zones with occupancy sensor automatically turn lights on when occupant is detected.
 - b. Zones with occupancy and/or photocell sensors turn lights off or dim when vacancy or sufficient daylight is detected.
 - c. If switch is pressed, lights turn off and a short "exit timer" begins. After time expires, sensor scans the room to detect whether occupant is still present. If no occupancy is detected, zone returns to auto-on. If occupancy is detected, light must be turned on via the switch
 - 3. Multi-Level On (multiple lighting levels per manual button press).
 - a. Operating mode designed specifically for bi-level applications.
 - b. Enables the user to cycle through the up to four potential on/off lighting states using a single button.
 - c. Eliminates user confusion as to which of two buttons controls which load.
 - d. Three different transition sequences are available in order to comply with energy codes or user preferences.
 - e. In addition to achieving bi-level lighting control by switching loads with relays, the ability to command dimming outputs to "step" in a sequence that achieves bi-level operation is present.
- O. A taskbar style desktop application shall be available for personal lighting control.
- P. An application that runs on "smart" handheld devices (such as smart phones) shall be available for personal lighting control.
- Q. Control software shall enable logging of system performance data and presenting useful information in a web-based graphical format and downloadable to .CSV files.
- R. Control software shall enable integration with a BMS via BACnet IP.
- S. System shall provide the option of having pre-terminated plenum rated CAT-5/6 cabling supplied with hardware.

2.03 SYSTEM BACKBONE EQUIPMENT

- A. Digital Electronic Time Clock
 - 1. Shall control and program a linear bus of lighting devices and supply all time function without connection to a system controller.
 - a. Programming of the linear bus of lighting devices shall not require additional hardware, including computers, specialized dongles, or other connection devices.
 - b. Programming of the linear bus shall be exclusively done through the touch screen interface.
 - 2. Shall be capable of up to 32 schedules. Each schedule shall consist of one set of On and Off times per day for each day of the week and for each of two holiday lists. The schedules shall apply to any individual relay or group of relays.
 - 3. Shall be run from non-volatile memory so that all system programming is retained indefinitely.
 - 4. Shall be optionally mounted inside of a relay panel. Installation inside of the relay panel shall eliminate the necessity of any additional enclosures for complete installation.

5. Device shall have a capacitive 3.5" full color touch screen.

2.04 WIRED NETWORKED DEVICES

- A. Wired Networked Wall Switches, Dimmers & Scene Controllers
 1. Wall switches, dimmers and scene controllers shall be the following nLight model numbers, with device options as specified, or approved Wattstopper DLM equivalent:
 - a. nPODMA (single on/off, pushbuttons).
 - b. nPODMA-DX (single on/off, single dimming raise/lower, pushbuttons)
 - c. nPODMA-2P-DX (two-channel on/off and dimming raise/lower, pushbuttons).
 - d. nPODMA-4S-DX (single on/off, 4-button scene control, dimming raise/lower, pushbutton).
 2. Devices shall recess into single-gang switch box and fit a standard GFI opening.
 3. Communication and low voltage power shall be delivered to each device via standard low voltage network cabling with RJ-45 connectors.
 4. All switches shall have the ability to detect when it is not receiving valid communication and blink its LED in a pattern to visually indicate a potential wiring issue.
 5. Devices with mechanical pushbuttons shall provide tactile and LED user feedback.
 6. Devices with mechanical pushbuttons shall be made available with custom button labeling.
- B. Wired Networked Occupancy Sensors
 1. Occupancy sensors shall be the following nLight model numbers, with device options as specified, or approved Wattstopper DLM equivalent:

Type	Model # Series	Low Voltage Aux. Relay	Lens Type	Detection Technology	Integral Photocell
	nCM 9 AR	Yes	Small Motion	360° PIR	No
	nCM 9 ADCX AR	Yes	Small Motion	360° PIR	Yes
	nCM PDT 9 AR	Yes	Small Motion	Dual 360° PIR, Microphonic	No
	nCM PDT 9 ADCX AR	Yes	Small Motion	Dual 360° PIR, Microphonic	Yes
	nCM PDT 10 AR	Yes	Large Motion	Dual 360° PIR, Microphonic	No
	nCM PDT 10 ADCX AR	Yes	Large Motion	Dual 360° PIR, Microphonic	Yes
	nCM 6 AR	Yes	High Bay	360° PIR	No
	nCM 6 ADCX AR	Yes	High Bay	360° PIR	Yes
	nWV 16	No	Wide View	120° PIR	No
	nWV 16 PDT	No	Wide View	120° PIR, Microphonic	No

2. Occupancy sensors system shall sense the presence of human activity within the desired space and fully control the on/off function of the lights.
3. Sensors shall utilize passive infrared (PIR) technology, which detects occupant motion, to initially turn lights on from an off state; thus, preventing false on conditions. Ultrasonic or Microwave based sensing technologies shall not be accepted.
4. For applications where a second method of sensing is necessary to adequately detect maintained occupancy (such as in rooms with obstructions), a sensor with an additional "dual" technology shall be used.
5. Dual technology sensors shall have one of its two technologies to not require motion to detect occupancy. Acceptable dual technology includes PIR/Microphonics (also known as Passive Dual Technology or PDT) which both looks for occupant motion and listens for sounds indicating occupants. Sensors where both technologies detect motion (PIR/Ultrasonic) shall not be acceptable.
6. All sensing technologies shall be acoustically passive meaning they do not transmit sounds waves of any frequency (for example in the Ultrasonic range), as these

technologies have the potential for interference with other electronic devices within the space (such as electronic white board readers). Acceptable detection technologies include Passive Infrared (PIR), and/or Microphonics technology. Ultrasonic or Microwave based sensing technologies shall not be accepted.

7. Ceiling sensors shall be provided with one integrated dry contact switching relay, capable of switching 1 amp at 24 VAC/VDC (resistive only). Dry contact switching relay for use with BAS system integration. Where an integrated relay is not available for a sensor, a discrete relay shall be provided for each sensor and installed in the digital control circuit.
8. Sensors shall be available with one or two occupancy "poles", each of which provides a programmable time delay.
9. Sensors shall have optional features for photosensor/daylight override, automatic dimming control, and low temperature/high humidity operation.
10. Communication and Class 2 low voltage power shall be delivered to each device via standard CAT-5 low voltage cabling with RJ-45 connectors.
11. All sensors shall have two RJ-45 ports or capable of utilizing a splitter.
12. All sensors shall have the ability to detect when it is not receiving valid communication (via CAT-5 connections) and blink its LED in a pattern to visually indicate of a potential wiring issue.
13. Every sensor parameter shall be available and configurable remotely from the software and locally via the device push-button.
14. Sensors shall be able to function together with other sensors in order to provide expanded coverage areas by simply daisy-chain wiring together the units with CAT-5 cabling.

C. Wired Networked Power Packs and Secondary Packs

1. Power (Relay) Packs and Supplies shall be the following nLight model numbers, or approved Wattstopper DLM equivalent:
 - a. nPP16 (Power pack with 16-amp relay).
 - b. nPP16 D (Power pack with 16-amp relay and 0-10VDC dimming output).
 - c. nPP16 ER (UL924 listed secondary pack with 16-amp relay for switching emergency power circuits).
 - d. nPP16 D ER (UL924 listed secondary pack with 16-amp relay and 0-10VDC dimming output for switching emergency circuits).
 - e. nPP20 PL (Power pack with full 20-amp relay switching of general purpose receptacle/circuit).
 - f. nSP5 PCD 2W (Power pack with 5-amp relay and 2-wire dimming)
 - g. nSP5 PCD 3W (Power pack with 5-amp relay and 2-wire dimming)
 - h. nSP5 PCD MLV (Power pack with 5-amp relay and magnetic low-voltage dimming)
 - i. nSP5 PCD ELV 120 (Power pack with 4-amp relay and electronic low-voltage dimming)
 - j. PS 150 (Standard power supply 150mA).
 - k. nPS 80 (Auxiliary bus power supply).
 - l. nAR 40 (Low voltage auxiliary relay pack)
2. Power Packs shall incorporate one optional Class 1 relay, optional 0-10 VDC dimming output, and contribute low voltage Class 2 power to the rest of the system.
3. Power Packs shall accept 120 or 277 VAC (or optionally 347 VAC) and carry a plenum rating.
4. Secondary Packs shall incorporate the relay and 0-10 VDC or line voltage dimming output, but shall not be required to contribute system power.
5. Power Supplies shall provide system power only, but are not required to switch line voltage circuit.
6. Auxiliary Relay Packs shall switch low voltage circuits only, capable of switching 1 amp at 40 VAC/VDC (resistive only).
7. Communication shall be delivered to each device via standard low voltage network cabling with RJ-45 connectors. Secondary packs shall receive low voltage power via standard low voltage network cable.
8. Power Pack programming parameters shall be available and configurable remotely from the software and locally via the device push-button.

9. Power Pack shall securely mount through a threaded ½ inch chase nipple or be capable of being secured within a luminaire ballast/driver channel. Plastic clips into junction box shall not be accepted. All Class 1 wiring shall pass through chase nipple into adjacent junction box without any exposure of wire leads. Note: UL Listing under Energy Management or Industrial Control Equipment automatically meets this requirement, whereas Appliance Control Listing does not meet this safety requirement.
10. When required by local code, Power Pack must install inside standard electrical enclosure and provide UL recognized support to junction box. All Class 1 wiring is to pass through chase nipple into adjacent junction box without any exposure of wire leads.

PART 3 - EXECUTION

3.01 INSTALLATION REQUIREMENTS

- A. Installation Procedures and Verification
 1. The successful bidder shall review all required installation and pre-startup procedures with the manufacturer's representative through pre-construction meetings.
 2. The successful bidder shall install and connect the networked lighting control system components according to the manufacturer's installation instructions, wiring diagrams, the project submittals and plans specifications.
 3. The successful bidder shall be responsible for testing of all low voltage network cable included in the bid. Bidder is responsible for verification of the following minimum parameters:
 - a. Wire Map (continuity, pin termination, shorts and open connections, etc.)
 - b. Length
 - c. Insertion Loss
- B. Documentation and Deliverables
 1. The installing contractor shall be responsible for documenting installed location of all networked devices, including networked luminaires. This includes responsibility to provide as-built plan drawing showing device address barcodes corresponding to locations of installed equipment.
 2. The installing contractor is also responsible for the following additional documentation to the manufacturer's representative if visualization / graphical floorplan software is provided as part of bid package:
 - a. As-Built floor plan drawings showing device address locations required above. All documentation shall remain legible when reproducing\scanning drawing files for electronic submission.
 - b. As-Built electrical lighting drawings (reflected ceiling plan) in PDF and CAD format. Architectural floor plans shall be based on as-built conditions.
 - 1) CAD files shall have layers already turned on/off as desired to be shown in the graphical floorplan background images. The following CAD elements are recommended to be hidden to produce an ideal background graphical image:
 - a) Titleblock
 - b) Text- Inclusive of room names and numbers, fixture tags and drawings notes.
 - c) Fixture wiring and homeruns
 - d) Control devices
 - e) Hatching or poche of light fixture or architectural elements.
 - 2) CAD files shall be of AutoCAD 2013 or earlier. Revit file overall floor plan views shall be exported to AutoCAD 2013.

3.02 IDENTIFICATION

- A. Identify system components, wiring, cabling, boxes, cabinets, and terminals. Comply with identification requirements specified in Section 26 0553 "Identification for Electrical Systems."
- B. Identify all ceiling-mounted controls with data bus number and device address.
- C. Label each device cable within 6 inch of connection to bus power supply or termination block.

3.03 FIELD QUALITY CONTROL

- A. Control Start-up and Configuration
 - 1. Contractor shall furnish all labor and test apparatus required to inspect, calibrate and prepare for service all instruments, controls, and accessory equipment furnished hereunder.
 - 2. System start-up and configuration shall be performed by a Manufacturers Certified Field Technician. Service to include.
 - a. Verify that control system has been installed in accordance with the manufacturer's installation instructions.
 - b. Verify that all control and communications wiring is properly connected and free of all shorts and ground faults. Verify that terminations are tight.
 - c. Verify that all lighting control devices properly communicate on network. Verify communication speed and reliability is acceptable.
 - d. Calibrate light level sensors. Perform calibration in accordance with manufacturers' recommendations.
 - e. Verify function of all installed devices.
 - f. Perform programming and configuration of control system components to achieve specified system performance.
- B. Control System Verification Testing
 - 1. Manufacturers Certified Field Technician shall completely test and verify specified control system performance. Provide verification report demonstrating proper system installation and operation. Verification shall include the following:
 - a. Lighting Control Configuration
 - 1) Provide a list of all programmed time schedules.
 - 2) Provide a list of all sweep times, sweep control on or off, and relays that are swept off.
 - 3) Provide a list of all group load assignments.
 - 4) Provide all photocell control parameters and setpoints.
 - 5) Provide a checkout document indicating the following:
 - a) Lighting relay designation
 - b) Relay number
 - c) Relay description
 - d) Power circuit feeding relay
 - e) Verified relay operation
 - f) Verified time schedule control
 - g) Verified sweep control
 - h) Verified photocell control
 - b. Low Voltage Switches
 - 1) Provide a verification document indicating the following:
 - a) Switch location
 - b) Verified switch operation
 - c) Verified switch override operation
 - c. Occupancy Sensors
 - 1) Provide a verification document indicating the following:
 - a) Room or space designation
 - b) Manufacturer
 - c) Model
 - d) Technology type
 - e) Trigger settings
 - f) Time delay settings
 - g) Sensitivity settings
 - h) Verified sensor operation
 - d. Photosensors
 - 1) Provide a verification document indicating the following:
 - a) Room or space designation

- b) Manufacturer
 - c) Model
 - d) Light level maintained at the work plane
 - e) Provide all parameters and settings for all devices
- e. Demonstration: Demonstrate operation of control system to Engineer, Commissioning Agent, and Owner. Schedule with Owner's Authorized Representative minimum 48 hours prior to Demonstration. Demonstration to include:
- 1) Menu functions
 - 2) Relay overrides
 - 3) Programming of relays, time schedules
- f. Commissioning Requirements
- 1) Contractor shall provide a minimum of four hours of on-site assistance to the commissioning provider.
 - 2) Provide necessary software, equipment, or other appurtenances required to execute functional performance testing.
 - 3) Issue Resolution: Where determined that the control system does not function as specified then the Manufacturers Certified Field Technician will meet the Commissioning Provider on-site to investigate and correct observed deficiencies at no additional cost to the Owner.
- C. Training: Provide minimum eight hours of training including operation and maintenance. Coordinate training time with Owner's Authorized Representative minimum 30 days prior to training. Training shall be performed prior to Substantial Completion and will not occur on the same day as equipment start-up.
- 1. All training sessions shall be videotaped and converted to DVD format for the Owner's use.

3.04 ADJUSTING

- A. Occupancy Adjustments: When requested within 12 months from date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.

END OF SECTION

SECTION 26 2416
PANELBOARDS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Distribution panelboards.
 - 2. Lighting and appliance branch-circuit panelboards.
 - 3. Load centers.
 - 4. Electronic-grade panelboards.

1.03 DEFINITIONS

- A. GFCI: Ground-fault circuit interrupter.
- B. MCCB: Molded-case circuit breaker.

1.04 ACTION SUBMITTALS

- A. Product Data: For each type of panelboard.
 - 1. Include materials, switching and overcurrent protective devices, SPDs, accessories, and components indicated.
 - 2. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.
- B. Shop Drawings: For each panelboard and related equipment.
 - 1. Include dimensioned plans, elevations, sections, and details.
 - 2. Show tabulations of installed devices with nameplates, conductor termination sizes, equipment features, and ratings.
 - 3. Detail enclosure types including mounting and anchorage, environmental protection, knockouts, corner treatments, covers and doors, gaskets, hinges, and locks.
 - 4. Detail bus configuration, current, and voltage ratings.
 - 5. Short-circuit current rating of panelboards and overcurrent protective devices.
 - 6. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.

1.05 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For panelboards and components to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 include the following:
 - 1. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
 - 2. Time-current curves, including selectable ranges for each type of overcurrent protective device that allows adjustments.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: ISO 9001 or 9002 certified.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Remove loose packing and flammable materials from inside panelboards; install temporary electric heating (250 W per panelboard) to prevent condensation.
- B. Handle and prepare panelboards for installation according to NECA 407.

1.08 FIELD CONDITIONS

- A. Environmental Limitations:
 - 1. Do not deliver or install panelboards until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above panelboards is complete, and temporary

- HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
2. Rate equipment for continuous operation under the following conditions unless otherwise indicated:
 - a. Ambient Temperature: Not exceeding 23 deg F to plus 104 deg F.
 - b. Altitude: Not exceeding 6,600 feet.
 - B. Service Conditions: NEMA PB 1, usual service conditions, as follows:
 1. Ambient temperatures within limits specified.
 2. Altitude not exceeding 6600 feet.
 - C. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
 1. Notify Architect no fewer than 7 days in advance of proposed interruption of electric service.
 2. Do not proceed with interruption of electric service without Owner's written permission.
 3. Comply with NFPA 70E.

1.09 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace panelboards that fail in materials or workmanship within specified warranty period.
 1. Panelboard Warranty Period: 12 months from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 PANELBOARDS AND LOAD CENTERS COMMON REQUIREMENTS

- A. Fabricate and test panelboards according to IEEE 344 to withstand seismic forces defined in Section 26 05 48.16 – Seismic Controls for Electrical Systems.
- B. Product Selection for Restricted Space: Drawings indicate maximum dimensions for panelboards including clearances between panelboards and adjacent surfaces and other items. Comply with indicated maximum dimensions.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- D. Comply with NEMA PB 1.
- E. Comply with NFPA 70.
- F. Enclosures: Dead-front cabinets.
 1. Rated for environmental conditions at installed location.
 - a. Indoor Dry and Clean Locations: NEMA 250, Type 1.
 2. Height: 84 inches maximum.
 3. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box. Trims shall cover all live parts and shall have no exposed hardware.
 4. Door in door. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover. Trims shall cover all live parts and shall have no exposed hardware.
 5. Finishes:
 - a. Panels and Trim: Steel and galvanized steel, factory finished immediately after cleaning and pretreating with manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat.
 - b. Back Boxes: Galvanized steel.
 - c. Fungus Proofing: Permanent fungicidal treatment for overcurrent protective devices and other components.
- G. Incoming Mains:
 1. Main Breaker: Main lug interiors up to 400 amperes shall be field convertible to main breaker.

- H. Phase, Neutral, and Ground Buses:
 - 1. Material: Hard-drawn copper, 98 percent conductivity.
 - a. Plating shall run entire length of bus.
 - b. Bus shall be fully rated the entire length.
 - 2. Interiors shall be factory assembled into a unit. Replacing switching and protective devices shall not disturb adjacent units or require removing the main bus connectors.
 - 3. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment grounding conductors; bonded to box.
 - 4. Full-Sized Neutral: Equipped with full-capacity bonding strap for service entrance applications. Mount electrically isolated from enclosure. Do not mount neutral bus in gutter.
 - 5. Extra-Capacity Neutral Bus: Neutral bus rated 200 percent of phase bus and listed and labeled by an NRTL acceptable to authority having jurisdiction, as suitable for nonlinear loads in electronic-grade panelboards and others designated on Drawings. Connectors shall be sized for double-sized or parallel conductors as indicated on Drawings. Do not mount neutral bus in gutter.
- I. Conductor Connectors: Suitable for use with conductor material and sizes.
 - 1. Material: Hard-drawn copper, 98 percent conductivity.
 - 2. Terminations shall allow use of 75 deg C rated conductors without derating.
 - 3. Size: Lugs suitable for indicated conductor sizes, with additional gutter space, if required, for larger conductors.
 - 4. Main and Neutral Lugs: Mechanical type, with a lug on the neutral bar for each pole in the panelboard.
 - 5. Ground Lugs and Bus-Configured Terminators: Mechanical type, with a lug on the bar for each pole in the panelboard.
 - 6. Extra-Capacity Neutral Lugs: Rated 200 percent of phase lugs mounted on extra-capacity neutral bus.
- J. Future Devices: Panelboards or load centers shall have mounting brackets, bus connections, filler plates, and necessary appurtenances required for future installation of devices.
- K. Panelboard Short-Circuit Current Rating: Fully rated to interrupt symmetrical short-circuit current available at terminals. Assembly listed by an NRTL for 100 percent interrupting capacity.
 - 1. Panelboards and overcurrent protective devices rated 240 V or less shall have short-circuit ratings as shown on Drawings, but not less than 10,000 A rms symmetrical.
 - 2. Panelboards and overcurrent protective devices rated above 240 V and less than 600 V shall have short-circuit ratings as shown on Drawings, but not less than 14,000 A rms symmetrical.

2.02 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Panelboards shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
 - 1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."

2.03 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

- A. Manufacturers:
 - 1. Eaton
 - 2. Siemens
 - 3. Square D
- B. Panelboards: NEMA PB 1, lighting and appliance branch-circuit type.
- C. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.
- D. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.

- E. Doors: Door-in-door construction with concealed hinges; secured with multipoint latch with tumbler lock; keyed alike. Outer door shall permit full access to the panel interior. Inner door shall permit access to breaker operating handles and labeling, but current carrying terminals and bus shall remain concealed.

2.04 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

- A. Manufacturers:
 - 1. Eaton
 - 2. Siemens
 - 3. Square D
- B. MCCB: Comply with UL 489, with interrupting capacity to meet available fault currents.
 - 1. Thermal-Magnetic Circuit Breakers:
 - a. Inverse time-current element for low-level overloads.
 - b. Instantaneous magnetic trip element for short circuits.
 - c. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.

2.05 IDENTIFICATION

- A. Panelboard Label: Manufacturer's name and trademark, voltage, amperage, number of phases, and number of poles shall be located on the interior of the panelboard door.
- B. Breaker Labels: Faceplate shall list current rating, UL and IEC certification standards, and AIC rating.
- C. Circuit Directory: Computer-generated circuit directory mounted inside panelboard door with transparent plastic protective cover.
 - 1. Circuit directory shall identify specific purpose with detail sufficient to distinguish it from all other circuits.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify actual conditions with field measurements prior to ordering panelboards to verify that equipment fits in allocated space in, and comply with, minimum required clearances specified in NFPA 70.
- B. Receive, inspect, handle, and store panelboards according to NECA 407.
- C. Examine panelboards before installation. Reject panelboards that are damaged, rusted, or have been subjected to water saturation.
- D. Examine elements and surfaces to receive panelboards for compliance with installation tolerances and other conditions affecting performance of the Work.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.
- B. Comply with NECA 1.
- C. Install panelboards and accessories according to NECA 407.
- D. Equipment Mounting:
 - 1. Attach panelboard to the vertical finished or structural surface behind the panelboard.
 - 2. Comply with requirements for seismic control devices specified in Section 26 0548 "Seismic Controls for Electrical Systems."
- E. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from panelboards.

- F. Comply with mounting and anchoring requirements specified in Section 26 05 48 – Seismic Controls for Electrical Systems.
- G. Mount top of trim 72” above finished floor unless otherwise indicated.
- H. Mount panelboard cabinet plumb and rigid without distortion of box.
- I. Mount recessed panelboards with fronts uniformly flush with wall finish and mating with back box.
- J. Install overcurrent protective devices and controllers not already factory installed.
- K. Make grounding connections and bond neutral for services and separately derived systems to ground. Make connections to grounding electrodes, separate grounds for isolated ground bars, and connections to separate ground bars.
- L. Install filler plates in unused spaces.
- M. Stub four 1-inch empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four 1-inch empty conduits into raised floor space or below slab not on grade.
- N. Arrange conductors in gutters into groups and bundle and wrap with wire ties.

3.03 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Acceptance Testing Preparation:
 - 1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
 - 2. Test continuity of each circuit.
- C. Tests and Inspections:
 - 1. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
- D. Prepare test and inspection reports, including a certified report that identifies panelboards included and that describes scanning results, with comparisons of the two scans. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.04 ADJUSTING

- A. Adjust moving parts and operable components to function smoothly and lubricate as recommended by manufacturer.

3.05 PROTECTION

- A. Temporary Heating: Prior to energizing panelboards, apply temporary heat to maintain temperature according to manufacturer's written instructions.

END OF SECTION

SECTION 26 2726
WIRING DEVICES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Standard-grade receptacles, 125 V, 20 A.
 - 2. GFCI receptacles, 125 V, 20 A.
 - 3. Toggle switches, 120/277 V, 20 A.
 - 4. Wall plates.

1.03 DEFINITIONS

- A. GFCI: Ground-fault circuit interrupter.

1.04 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.
- C. Samples: One for each type of device and wall plate specified, in each color specified.

1.05 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.06 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing-label warnings and instruction manuals that include labeling conditions.

PART 2 - PRODUCTS

2.01 GENERAL WIRING-DEVICE REQUIREMENTS

- A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
- B. Comply with NFPA 70.
- C. RoHS compliant.
- D. Comply with NEMA WD 1.
- E. Devices that are manufactured for use with modular plug-in connectors are not acceptable.
- F. Devices for Owner-Furnished Equipment:
 - 1. Receptacles: Match plug configurations.
 - 2. Cord and Plug Sets: Match equipment requirements.
- G. Device Color:
 - 1. Wiring Devices Connected to Normal Power System: Gray unless otherwise indicated or required by NFPA 70 or device listing.
 - 2. Wiring Devices Connected to Essential Electrical System: Red.
- H. Receptacles shall be Industry Class 5362.
- I. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.02 SPECIFICATION-GRADE RECEPTACLES, 125 V, 20 A

- 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:

1. Hubbell Incorporated (Commercial and Industrial Group - Wiring Device-Kellems).
 2. Leviton Manufacturing Co., Inc.
 3. Pass & Seymour/Legrand (Pass & Seymour).
- B. Duplex Receptacles, 125 V, 20 A:
1. Description: Two pole, three wire, and self-grounding.
 2. Configuration: NEMA WD 6, Configuration 5-20R.
 3. Standards: Comply with UL 498 and FS W-C-596.

2.03 GFCI RECEPTACLES, 125 V, 20 A

- 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:
1. Hubbell Incorporated (Commercial and Industrial Group - Wiring Device-Kellems).
 2. Leviton Manufacturing Co., Inc.
 3. Pass & Seymour/Legrand (Pass & Seymour).
- B. Duplex GFCI Receptacles, 125 V, 20 A:
1. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding.
 2. Configuration: NEMA WD 6, Configuration 5-20R.
 3. Type: Non-feed through.
 4. Standards: Comply with UL 498, UL 943 Class A, and FS W-C-596.
- C. Standards: Comply with FS W-C-596.

2.04 TOGGLE SWITCHES, 120/277 V, 20 A

- 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:
1. Hubbell Incorporated (Commercial and Industrial Group - Wiring Device-Kellems).
 2. Leviton Manufacturing Co., Inc.
 3. Pass & Seymour/Legrand (Pass & Seymour).
- B. Single- and Two-Pole Switches, 120/277 V, 20 A:
1. Standards: Comply with UL 20 and FS W-S-896.

2.05 WALL PLATES

- A. Single Source: Obtain wall plates from same manufacturer of wiring devices.
- B. Single and combination types shall match corresponding wiring devices.
1. Plate-Securing Screws: Metal with head color to match plate finish.
 2. Material for Finished Spaces: 0.035-inch-thick, satin-finished, Type 302 stainless steel.
 3. Material for Unfinished Spaces: Galvanized steel.
 4. Material for Damp Locations: Cast aluminum with spring-loaded lift cover, and listed and labeled for use in wet and damp locations.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.
- B. Coordination with Other Trades:
1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes, and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
 2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
 3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
 4. Install wiring devices after all wall preparation, including painting, is complete.

- C. Conductors:
 - 1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
 - 2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
 - 3. The length of free conductors at outlets for devices shall comply with NFPA 70, Article 300, without pigtails.
 - 4. Existing Conductors:
 - a. Cut back and pigtail or replace all damaged conductors.
 - b. Straighten conductors that remain and remove corrosion and foreign matter.
 - c. Pigtailing existing conductors is permitted, provided the outlet box is large enough.
- D. Device Installation:
 - 1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
 - 2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
 - 3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
 - 4. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.
 - 5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
 - 6. Use a torque screwdriver when a torque is recommended or required by manufacturer.
 - 7. When conductors larger than No. 12 AWG are installed on 20-A circuits, splice No. 12 AWG pigtails for device connections.
 - 8. Tighten unused terminal screws on the device.
 - 9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.
 - 10. Install toggle switches at 48 inches (to center line of faceplate) above finished floor with OFF position down, unless otherwise noted.
 - 11. Install receptacles at 18 inches (to center line of faceplate) above finished floor, unless otherwise noted.
 - 12. Verify mounting height and orientation of wiring devices above counter tops and benches with Architectural Details prior to rough-in.
- E. Receptacle Orientation:
 - 1. Install ground pin of vertically mounted receptacles down, and on horizontally mounted receptacles to the left.
- F. Device Plates:
 - 1. Do not use oversized or extra-deep plates.
 - 2. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush, level, or do not cover rough wall opening.
 - 3. Where outlets are adjacent to each other at same mounting heights, install under common device plate, except where outlets are of different voltages, such as data and duplex receptacle, unless otherwise noted.
- G. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multi-gang wall plates.
- H. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

3.02 GFCI RECEPTACLES

- A. Install non-feed-through GFCI receptacles where protection of downstream receptacles is not required.

3.03 FIELD QUALITY CONTROL

- A. Test Instruments: Use instruments that comply with UL 1436.
- B. Test Instrument for Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.
- C. Perform the following tests and inspections:
 - 1. In healthcare facilities, prepare reports that comply with NFPA 99.
 - 2. Test Instruments: Use instruments that comply with UL 1436.
 - 3. Test Instrument for Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.
- D. Tests for Receptacles:
 - 1. Line Voltage: Acceptable range is 105 to 132 V.
 - 2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
 - 3. Ground Impedance: Values of up to 2 ohms are acceptable.
 - 4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
 - 5. Using the test plug, verify that the device and its outlet box are securely mounted.
- E. Wiring device will be considered defective if it does not pass tests and inspections.
- F. Prepare test and inspection reports.

END OF SECTION

SECTION 26 5100
LIGHTING FIXTURES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Related Requirements:
 - 1. Section 26 0924 "Digital Lighting Control Equipment" for manual or programmable control systems with low-voltage control wiring or data communication circuits.

1.02 DEFINITIONS

- A. CCT: Correlated color temperature.
- B. CRI: Color Rendering Index.
- C. Fixture: See "Luminaire."
- D. IP: International Protection or Ingress Protection Rating.
- E. LED: Light-emitting diode.
- F. Lumen: Measured output of lamp, or luminaire assembly.
- G. Luminaire: Complete lighting unit, including lamp, reflector, and housing.

1.03 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Arrange in order of luminaire designation.
 - 2. Include data on features, accessories, and finishes.
 - 3. Include physical description and dimensions of luminaires.
 - 4. Include emergency lighting units, including batteries and chargers.
 - 5. Include life, output (lumens, CCT, and CRI), and energy-efficiency data.
 - 6. Photometric data and adjustment factors based on laboratory tests[, complying with IES "Lighting Measurements Testing and Calculation Guides" for each luminaire type. The adjustment factors shall be for lamps and accessories identical to those indicated for the luminaire as applied in this project, IES LM-79 and IES LM-80.
- B. Shop Drawings: For nonstandard or custom luminaires.
 - 1. Include plans, elevations, sections, and mounting and attachment details.
 - 2. Include details of luminaire assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 3. Include diagrams for power, signal, and control wiring.

1.04 QUALITY ASSURANCE

- A. Provide luminaires from a single manufacturer for each luminaire type.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Protect finishes of exposed surfaces by applying a strippable, temporary protective covering before shipping.

1.06 WARRANTY

- A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.
- B. Warranty Period: Five year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 ACCEPTABLE LUMINAIRES

- A. Refer to LUMINAIRE SCHEDULE.

2.02 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Luminaires shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
 - 1. The term "withstand" means "the luminaire will remain in place without separation of any parts when subjected to the seismic forces specified."
- B. Ambient Temperature: 41 to 104 deg F unless noted otherwise.
 - 1. Relative Humidity: Zero to 95 percent.

2.03 LUMINAIRE REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps, as needed. Locate labels where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.
 - 1. Label shall include the following lamp characteristics:
 - a. "USE ONLY" and include specific lamp type.
 - b. Lamp diameter, shape, size, wattage, and coating.
 - c. CCT and CRI.
- C. RECESSED LUMINAIRES
 - 1. Recessed luminaires shall comply with NEMA LE 4.
 - 2. Supply recessed luminaire complete with trim type required for ceiling system installed. Before ordering, confirm ceiling construction details and architectural finish for each area.
- D. PENDANTS/CABLE HANGERS
 - 1. Swivel sockets permitting normal fixture motion and self-adjustment. Adjustable to provide fixture height alignment.
 - 2. One-piece with matching canopies
 - 3. Fixtures shall be factory counter-weighted and balanced to provide level hanging. Weights shall not be visible.
 - 4. Cable hangers shall be adjustable for a minimum of 12".
- E. LED LUMINAIRES
 - 1. LED light fixtures shall be in accordance with IES, NFPA, UL as shown on the Drawings and as specified.
 - 2. LED light fixtures shall be Reduction of Hazardous Substances (RoHS) compliant.
 - 3. LED drivers shall include the following features unless otherwise indicated:
 - a. Minimum Efficiency: 85% at full load.
 - b. Minimum Operating Ambient Temperature: -20°C (-4°F).
 - 4. Input Voltage: 120-277V (±10%) at 60 Hz.
 - 5. Integral short circuit, open circuit, and overload protection.
 - 6. Power Factor: ≥ 0.95.
 - 7. Total Harmonic Distortion: ≤ 20%.
 - 8. 4-wire (0-10VDC voltage controlled) dimming driver.
 - a. Capable of dimming to black from 100% to 1% light output and step to 0%. Driver shall respond similarly when raising from 0% to 100%.
 - 9. Driver shall be free from objectionable flicker as measured by flicker index (ANSI/IES RP-16-10).
 - 10. LED modules shall include the following features unless otherwise indicated:
 - a. Comply with IES LM-79 and LM-80 requirements.
 - b. Minimum CRI 80 unless otherwise specified in LUMINAIRE SCHEDULE.
 - c. Minimum Rated Life: 50,000 hours per IES L70.
 - d. Light output lumens as indicated in the LUMINAIRE SCHEDULE.
- F. LED Downlights
 - 1. LED drivers, modules, and reflector shall be accessible, serviceable, and replaceable from below the ceiling.
 - 2. Housing, LED driver, and LED module shall be products of the same manufacturer.

- G. LED Troffers:
 - 1. LED drivers, modules, and reflector shall be accessible, serviceable, and replaceable from below the ceiling.
 - 2. Housing, LED driver, and LED module shall be products of the same manufacturer.
- H. EXIT Signage:
 - 1. Exit signs will be provided and mounted as indicated on documents and be configured to display egress directional arrows as shown, following NFPA Life Safety Code. On projects without existing or installed standby power, self-powered (battery) options shall be required.

PART 3 - EXECUTION

3.01 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.
- B. Examine roughing-in for luminaire to verify actual locations of luminaire and electrical connections before luminaire installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 LUMINAIRE SUPPORT

- A. Single-Stem Hangers: 1/2-inch steel tubing with swivel ball fittings and ceiling canopy. Finish same as luminaire.
- B. Rod Hangers: 3/16-inch minimum diameter, cadmium-plated, threaded steel rod.
- C. Hook Hangers: Integrated assembly matched to luminaire, line voltage, and equipment with threaded attachment, cord, and locking-type plug.

3.03 INSTALLATION

- A. Comply with NECA 1.
- B. Install luminaires level, plumb, and square with ceilings and walls unless otherwise indicated.
- C. Install lamps in each luminaire, as needed.
- D. Supports:
 - 1. Sized and rated for luminaire weight.
 - 2. Able to maintain luminaire position after cleaning and relamping.
 - 3. Provide support for luminaire without causing deflection of ceiling or wall.
 - 4. Luminaire-mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire weight and a vertical force of 400 percent of luminaire weight.
- E. Flush-Mounted Luminaires:
 - 1. Secured to outlet box.
 - 2. All luminaires 12 lbs. or above to be attached directly to ceiling structural members.
 - 3. Trim ring flush with finished surface.
- F. Suspended Luminaires:
 - 1. Ceiling Mount:
 - 2. Do not use ceiling grid as support for pendant luminaires. Connect support wires or rods to building structure.
- G. Ceiling-Grid-Mounted Luminaires:
 - 1. Secure to any required outlet box.

3.04 IDENTIFICATION

- A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 26 0553 "Identification for Electrical Systems."

3.05 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:

1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
 2. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery power and retransfer to normal.
- B. Luminaire will be considered defective if it does not pass operation tests and inspections.
- C. Prepare test and inspection reports.

3.06 ADJUSTING

- A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting the direction of aim of luminaires to suit occupied conditions. Make up to two visits to Project during other-than-normal hours for this purpose. Some of this work may be required during hours of darkness.
1. During adjustment visits, inspect all luminaires. Replace lamps or luminaires that are defective.
 2. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.

END OF SECTION

SECTION 27 1500
COMMUNICATIONS HORIZONTAL CABLING

PART 1 - GENERAL

1.01 SCOPE

- A. This section details product and execution requirements for Horizontal (Station) Cabling for Communications Systems.

1.02 DESCRIPTION

- A. Systems shall include cabling, termination hardware and active components, installed as indicated on drawings and specifications.
- B. Cables and equipment shall be provided, tested, and terminated, including proper grounding and bonding.
- C. Communications Horizontal cabling subsystem is portion of communication link that connects horizontal or intermediate cross-connect (typically at Telecom Room) and Telecommunications Outlet as part of a cabling system.
 - 1. Horizontal Cable types include:
 - a. 4-pair Copper Unshielded Twisted Pair (UTP)

1.03 DEFINITIONS

- A. In this section, "Telecommunications Outlet" is considered to consist of Frame/Faceplate into which Modular Jacks or other couplings snap, Modular Jacks, blanks fitted to unused jack positions, and labeling/identification components.

1.04 SUBMITTALS

- A. submit:
 - 1. Samples of each Telecommunications Outlet Faceplate type to confirm color and material.
 - 2. One 3-foot section of each cable type from cable reels sent to site for Engineer's final approval.
 - a. Section shall have manufacturer's cable markings visible.
 - 3. Nominal Velocity of Propagation (NVP) for 4-pair Horizontal Copper Cable.

1.05 QUALITY ASSURANCE

- A. Refer to Section 27 0500 - General Communications Requirements and Section 27 1000 - Structured Cabling which identify general quality assurance requirements for the Project.

1.06 GUARANTEE

- A. Refer to Division 01, General Conditions, and General Requirements - Guarantee Documents for general warranty requirements.
- B. Refer to Section 27 1000 - Structured Cabling for particular Warranty requirements for Structured Cabling. Those requirements apply to all cable and components covered in this section.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Cables and Termination hardware shall be technically compliant with and installed in accordance with referenced TIA documents.
- B. Cables shall be Underwriters Laboratory (UL) listed, comply with Article 800 (Communications Circuits) of National Electrical Code and shall meet specifications of NEMA (low loss), UL 444, and ICEA (where applicable).
- C. Horizontal (Station) Cable and Termination Components (Jack, Patch Panel) are specified to function as System.
 - 1. Where required for warranty purposes, manufacturers of cabling and termination components used (if more than one) shall recognize each other in their Certification Programs.

- D. 4-Pair Horizontal Copper Cables and Modular Jacks are application independent (i.e., voice will share the same cable as data).

2.02 4-PAIR HORIZONTAL COPPER CABLE

- A. Cables shall be suitable for installation in environment defined.
- B. Cabling shall be packaged to minimize tangling and kinking of cable during installation.
- C. Configuration:
 - 1. Number of Pairs: 4 twisted pair
 - a. Pair twists of any pair shall not be same as any other pair.
 - b. Pair twist lengths shall be selected by manufacturer to ensure compliance with crosstalk requirements of TIA 568.
 - 2. Conductors: insulated solid annealed copper pairs
 - a. Category 6 & 6A: 23 AWG
 - b. Pairs of 4-pair cables shall be identified by banded color code in which conductor insulation is marked with dominant color and banded with contrasting color.
 - 1) By pair number, pair colors or dominant band are:
 - a) Pair 1: Tip - White/Blue; Ring - Blue (or Blue/White)
 - b) Pair 2: Tip - White/Orange; Ring - Orange (or Orange/White)
 - c) Pair 3: Tip - White/Green; Ring - Green (or Green/White)
 - d) Pair 4: Tip - White/Brown; Ring - Brown (or Brown/White)
 - 3. Cable Rating: NEC Article 800 Type CMP, UL listed.
 - 4. Maximum outside diameter:
 - a. Category 6: 0.25 inches
 - b. Category 6A: 0.28 inches
 - 5. Cable routed thru wet locations shall be listed as such in addition to riser/plenum if cable routing requires.
- D. Horizontal Voice/Data Cable:
 - 1. Shall meet or exceed TIA Category 6 or TIA Category 6A performance requirements per application requirements stated elsewhere.
 - 2. Shall not incorporate an overall shield.
 - 3. Jacket Color: UON in Telecommunications Configuration Schedule on Drawings, per application requirements as stated elsewhere.
- E. Horizontal Data Cable:
 - 1. Shall meet or exceed TIA Category 6 TIA Category 6A performance requirements.
 - 2. Shall incorporate an overall shield.
 - 3. Jacket Color: UON in Telecommunications Configuration Schedule on Drawings, Blue.

2.03 TELECOMMUNICATIONS OUTLET

- A. Each outlet shown on drawings has two communication ports unless otherwise noted.
- B. Connectors (modular jacks, fiber optic couplings, and coaxial connectors, each as applicable) shall snap onto faceplate.
 - 1. In surface-mount designs (if applicable) Jacks and connectors may mount to frame onto which coverplate is mounted.
- C. Work Area Faceplate
 - 1. Wall-mounted faceplates intended to be used in general work areas shall:
 - a. Be configured to mount on standard, single gang opening when wall mounted.
 - b. Accommodate minimum of 4 modular jacks and connectors, configuration as detailed on drawings in Telecommunications Outlet Configuration Schedule.
 - c. Be constructed of high impact plastic (except where otherwise noted).
 - d. Incorporate recessed designation strips at top and bottom of frame for identifying labels.
 - 1) Triple row faceplates with no provisions for labeling of middle outlet row are not acceptable.
 - 2) Designation strips shall be fitted with clear plastic covers.

- 3) Designation strips and covers shall be positioned over faceplate mounting screws.
2. Faceplate Color: to match electrical device faceplates.

2.04 MODULAR JACK

- A. Manufacturers: Refer to "Telecommunications Outlet" above.
- B. Modular Jacks shall be:
 1. 8-position, 8-conductor (8P8C)
 2. Non-keyed
- C. Jacks shall have an attached color-coded wiring instruction label as an aid to installer.
- D. Interface between jack and station cable shall be insulation displacement type contact.
- E. Termination components shall maintain cable's pair twists as closely as possible to point of mechanical termination.
- F. Jack contacts shall have minimum of 50 micro-inches of gold plating.
- G. Data Jack shall:
 1. Meet or exceed performance requirements of TIA Category 6.
 2. Be color White.
 - a. Alternately, color-coded Bezel or Icon may be used to identify Jack type.

PART 3 - EXECUTION

3.01 GENERAL

- A. Refer to project Drawings for outlet locations.
- B. Provide Modular Jacks, Coaxial Connectors (if applicable) and Fiber Optic couplings (if applicable) in faceplates as shown on Project Documents.
 1. Provide 1 faceplate per Telecommunications Outlet symbol shown on Project Documents.
- C. Maximum length of 4-pair Category-rated horizontal cable shall not exceed 295 feet (90 m) measured from horizontal cross-connect (typically at TR) to Telecommunications Outlet.
 1. Includes slack required for installation and termination.
 2. Contractor is responsible for installing station cable to avoid unnecessarily long runs.
 3. Any area that cannot be reached within above constraints shall be identified and reported to Engineer prior to installation.
- D. Follow manufacturers recommended termination practices.

3.02 CABLE INSTALLATION AND TERMINATION

- A. Horizontal Copper Twisted-Pair Cabling
 1. Provide horizontal copper twisted pair cable between horizontal cross connect (typically at Telecommunications Room) and Telecommunications Outlet.
 2. At Telecommunications Outlet, terminate each 4-pair Horizontal Cable on 8P8C Modular Jack.
 - a. Terminating one cable on more than one jack is not allowed.

3.03 TELECOMMUNICATIONS OUTLET

- A. Mount modular jacks and connectors into faceplates and secure faceplates to outlet box, raceway or modular furniture.
 1. Use faceplate extender if required to provide adequate clearance between jack and furniture or raceway panel to maintain minimum cable bend radius.
 2. Provide blank(s) in unused jack/connector positions. Match color of blank to faceplate color.
- B. Position Telecommunications Outlet for wall-mounted telephone in area clear of other utilities and wall mounted hardware.
 1. Coordinate with other trades to maintain 8-inch clear space (minimum) on all sides from faceplate centerline.

- C. MPTL connectors shall be installed following connector manufacturer requirements.
 - 1. Contractor shall ensure installed MPTL will fit in available space at outlet-end of cable while maintaining cable bend radius requirements.

3.04 FIELD TESTING

- A. Refer to Sections 27 0500 - General Communications Requirements and 27 1000 – Structured Cabling for guidelines regarding testing requirements common to all Division 27 Structured Cabling sections.
 - 1. In addition, refer to sub-sections below for cable type under test.
- B. 4-Pair Horizontal Copper Cable
 - 1. Test from:
 - a. Horizontal Cross-connect (HC) to Jack at Telecommunications Outlet (TO).
 - 2. Testing shall be per TIA-568 Permanent Link test configurations.
 - 3. Maximum length of station cable shall not exceed 300 ft.
 - 4. Cables shall be free of shorts within pairs, and be verified for Continuity, Pair Validity and Polarity, and Wire Map (Conductor Position on Modular Jack).
 - a. Identify and correct defective, split or mis-positioned pairs.
 - 5. In addition to above, Performance Testing shall be performed on all cables. Testing of Transmission Performance shall include the following:
 - a. Length
 - b. Insertion Loss / Attenuation
 - c. Pair-to-pair NEXT (Near End Crosstalk)
 - d. PSNEXT (Power Sum Near End Crosstalk)
 - e. Pair-to-pair ELFEXT (Equal Level Far End Crosstalk)
 - f. PSELFEXT (Power Sum Equal Level Far End Crosstalk)
 - g. Return Loss
 - h. Propagation Delay
 - i. Delay Skew
 - 6. Test cables to maximum frequency defined by standards covering specified performance category.

3.05 DOCUMENTATION

- A. Information added by Contractor to Record Drawings relating to Horizontal Cabling shall include cable routes, outlet locations and numbering and other detail necessary to document cable installation.

END OF SECTION

SPRINGFIELD CITY HALL RENOVATION

CITY OF SPRINGFIELD

225 5TH STREET SPRINGFIELD, OR 97477



CONSTRUCTION DRAWINGS

09.28.2023

2125.00

PROJECT TEAM

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VICINITY MAP



ABBREVIATIONS

@	ANCHOR BOLT
AB	ASPHALTIC CONCRETE
AC	ACOUSTIC
ACOUS	ACOUSTICAL TILE CEILING SYSTEM
ACT	ABOVE FINISH FLOOR
AFF	ALUMINUM
ALUM	BUILDING
BLDG	BOTTOM OF
BO	CATCH BASIN
CB	CONTRACTOR FURNISHED/CONTRACTOR INSTALLED
CFCI	CONTROL JOINT
CJ	CENTER LINE
CL	CEILING
CLG	CLEAR
CLR	CONCRETE MASONRY UNIT
CMU	COLUMN
COL	CONCRETE
CONC	CONTINUOUS
CONT	CARPET
CPT	DOUBLE
DBL	DEMOLITION/DEMOLISH
DEMO	DOUGLAS FIR, DRINKING FOUNTAIN
DF	DIAGONAL
DIAG	DIAMETER
DIA	DISPENSER
DISP	DOWN
DN	DOWNSPOUT
DS	DETAIL
DTL	DRAWING
DWG	EXISTING
(E)	EACH
EA	EACH
EJ	EXPANSION JOINT
EL, ELEV	ELEVATION
ELEC	ELECTRICAL
ENAM	ENAMEL
EQ	EQUAL
EW	EACH WAY
EXT	EXTERIOR
FD	FLOOR DRAIN
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FFE	FINISH FLOOR ELEVATION
FF	FINISH FLOOR
FIN	FINISH/FINISHED
FLR	FLOOR
FO	FACE OF
FOF	FACE OF FINISH
FRP	FIBER REINFORCED PANEL
FTG	FOOTING
GA	GAUGE
GB	GRAB BAR
GLB	GLUE LAM BEAM
GYP BD	GYPSUM BOARD
GYP	GYPSUM BOARD
HGT	HEIGHT
HORIZ	HORIZONTAL
HR	HANDRAIL
HM	HOLLOW METAL
INSUL	INSULATION
INT	INTERIOR
JOINT	JOINT
KD	KNOCK DOWN
LAV	LAVATORY
LOC	LOCATION
MAX	MAXIMUM
MECH	MECHANICAL
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MTL	METAL
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIMENSION
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED OWNER INSTALLED
OFS	OUTSIDE FACE OF STUD
OH	OPPOSITE HAND
OPNG	OPENING
OPP	OPPOSITE
PJ	PANEL JOINT
P LAM	PLASTIC LAMINATE
PS	PAINT SYSTEM
PT	PRESSURE TREATED
PTD	PAINTED
PLY	PLYWOOD
R	RADIUS
RB	RUBBER BASE
RD	ROOF DRAIN
RM	ROOM
RO	ROUGH OPENING
ROW	RIGHT OF WAY
RUB	RUBBER
RVL	REVEAL
SD	STORM DRAIN
SECT	SECTION
SHT	SHEET
SIM	SIMILAR
SPECS	SPECIFICATIONS
SQFT, SF	SQUARE FOOT
S STL	STAINLESS STEEL
STD	STANDARD
STL	STEEL
STRUC	STRUCTURAL
T	TEMPERED
T&B	TOP & BOTTOM
T&G	TONGUE AND GROOVE
TEMP	TEMPORARY
TO	TOP OF
TOC	TOP OF CONCRETE
TOW	TOP OF WALL
TOS	TOP OF STRUCTURE
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VY	VERIFY
VIF	VERIFY IN FIELD
WA	WALL ASSEMBLY
WD	WOOD
WP	WATER PROOF
WRB	WATER RESISTIVE BARRIER

ARCHITECTURAL SYMBOLS

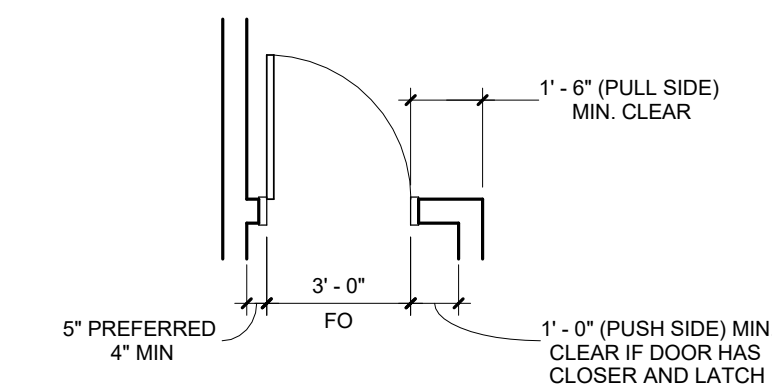
	BUILDING ELEVATION
	INTERIOR ELEVATION
	BUILDING SECTION
	WALL SECTION
	DETAIL SECTION
	DETAIL CALLOUT
	SPECIFICATION KEYNOTE* *LETTER IS A DESIGNATOR AND IS NOT LINKED TO A SPECIFIC SPEC ITEM
	KEYNOTE
	FINISH TAG
	CASEWORK
	REVISION TAG
	COLUMN CENTERLINE
	EXISTING COLUMN CENTERLINE
	ACCESS CONTROL

WALL FILL PATTERNS:

	EXISTING WALL ASSEMBLY
	NON FIRE-RATED WALL ASSEMBLY
	NON FIRE-RATED WALL ASSEMBLY
	1-HOUR FIRE-RATED WALL
	2-HOUR FIRE-RATED WALL

	FLOOR MATERIAL TRANSITION
	ROOM NAME & NUMBER
	WINDOW SYMBOL
	STOREFRONT SYMBOL
	DOOR SYMBOL
	CEILING HEIGHT SYMBOL
	VERTICAL ELEVATION
	INTERIOR WALL TYPE WITH NO SOUND ATTENUATION
	INTERIOR WALL TYPE WITH SOUND ATTENUATION
	ROOM FINISH TAG
	FIRE EXTINGUISHER
	EXIT SIGN
	DOOR ACTUATOR
	TEMPERED GLAZING
	SLOPE ARROW (SLOPE AS INDICATED)

GENERAL NOTES - DIM. PLANS



A. DOORS SHOWN ADJACENT TO A FLANKING WALL OR OTHER FIXED OBSTRUCTION, SHALL BE LOCATED AS SHOWN ABOVE.

B. OTHER LOCATIONS SHALL BE ON CENTERLINE OF ROOM OR AS SPECIFICALLY DIMENSIONED.

SHEET INDEX

GENERAL	TITLE	TITLE SHEET
	G011	CODE REVIEW INFORMATION
	G012	LIFE SAFETY PLAN - CM OFFICE
	G013	LIFE SAFETY PLAN - LIBRARY
DEMOLITION	D111	DEMOLITION PLAN - CM OFFICE
	D112	DEMOLITION PLAN - LIBRARY
	D121	DEMOLITION CEILING PLAN - CM OFFICE
	D122	DEMOLITION CEILING PLAN - LIBRARY
ARCHITECTURE	A101	PHASING PLANS
	A111	FLOOR PLAN - CM OFFICE
	A112	FLOOR PLAN - LIBRARY
	A113	FLOOR PLAN - CHILDREN'S LIBRARY
	A121	REFLECTED CEILING PLAN - CM OFFICE
	A122	REFLECTED CEILING PLAN - LIBRARY
	A201	EXTERIOR ELEVATION
	A301	SECTIONS - CM OFFICE
	A302	SECTIONS - LIBRARY
	A321	BUILDING DETAILS - CM OFFICE
	A500	ROOM FINISH AND MATERIALS LEGEND
	A501	FINISH PLAN - CM OFFICE
	A502	FINISH PLAN - LIBRARY
	A531	WALL ASSEMBLY INFORMATION
	A532	INTERIOR NON-STRUCTURAL WALLS FRAMING DETAILS
	A536	TOP OF WALL DETAILS
	A540	MOUNTING HEIGHT SCHEDULE
	A541	INTERIOR ELEVATIONS - CM OFFICE
	A542	INTERIOR ELEVATIONS - CM OFFICE
	A543	INTERIOR ELEVATIONS - CM OFFICE
	A544	INTERIOR ELEVATIONS - LIBRARY
	A545	INTERIOR ELEVATIONS - LIBRARY
	A546	INTERIOR ELEVATIONS - LIBRARY
	A547	INTERIOR ELEVATIONS - LIBRARY
	A571	INTERIOR DETAILS - FLOOR AND CEILING
	A572	INTERIOR DETAILS - CASEWORK
	A573	INTERIOR DETAILS - TRANSACTION WINDOW
	A574	INTERIOR DETAILS - CIRCULATION DESK
	A575	INTERIOR DETAILS - CIRCULATION DESK
	A576	INTERIOR DETAILS - ACOUSTICAL PANELS
	A601	DOOR SCHEDULE - CM OFFICE
	A602	DOOR SCHEDULE - LIBRARY
	A620	DOOR INFORMATION
	A641	DOOR AND WINDOW DETAILS
	A801	FURNITURE PLAN - CM OFFICE (FOR REFERENCE ONLY)
	A802	FURNITURE PLAN - LIBRARY
MECHANICAL	M001	LEGEND, GENERAL NOTES & SHEET LIST
	M101	DEMOLITION PLAN - CM OFFICE
	M102	DEMOLITION PLAN - LIBRARY
	M121	FLOOR PLAN CM OFFICE
	M122	FLOOR PLAN LIBRARY
	M501	DETAILS
	M601	SCHEDULES
	M701	ZONE PLAN CM OFFICE
	M702	ZONE PLAN LIBRARY
PLUMBING	P001	LEGEND, GENERAL NOTES & SHEET LIST
	P101	SECOND FLOOR DEMOLITION PLAN - CM OFFICE
	P102	SECOND FLOOR DEMOLITION PLAN LIBRARY
	P121	FIRST FLOOR PLAN - CM OFFICE
	P122	SECOND FLOOR PLAN - CM OFFICE
	P123	SECOND FLOOR PLAN LIBRARY
	P601	SCHEDULES AND DETAILS
FIRE PROTECTION	F001	LEGEND, GENERAL NOTES & SHEET LIST
	F111	SECOND FLOOR PLAN - CM OFFICE
	F112	SECOND FLOOR PLAN LIBRARY
ELECTRICAL	E001	LEGEND, GENERAL NOTES & SHEET LIST
	E101	DEMOLITION PLAN - CM OFFICE
	E102	DEMOLITION PLAN LIBRARY
	E103	LIGHTING DEMOLITION PLAN - CM OFFICE
	E104	LIGHTING DEMOLITION PLAN LIBRARY
	E111	LIGHTING PLAN - CM OFFICE
	E112	LIGHTING PLAN LIBRARY
	E121	FLOOR PLAN CM OFFICE
	E122	FLOOR PLAN LIBRARY
	E601	SCHEDULES
	E621	WIRING DIAGRAMS

ALTERNATES

SEE SPECIFICATION

BUILDING CODE INFORMATION

ADDRESS:
225 5TH STREET
SPRINGFIELD, OR 97477

MAP AND TAX LOT:
MAP 17033531, TAX LOT 3300

AUTOMATIC SPRINKLER SYSTEM:
YES

FIRE ALARM:
EXISTING THROUGHOUT FLOOR

NO CHANGES TO THE FOLLOWING:
OCCUPANCY TYPE
MAIN BUILDING EGRESS PATHWAY
MAIN BUILDING EGRESS SYSTEM
CONSTRUCTION TYPE

APPLICABLE CODE:

2022 OREGON STRUCTURAL SPECIALTY CODE
ICC 117.1-2019 ACCESSIBILITY CODE

DEFERRED SUBMITTALS

- STOREFRONT SYSTEMS
- FIRE SUPPRESSION
- MECHANICAL
- ELECTRICAL
- FIRE ALARM SYSTEM

SPECIAL INSPECTIONS

OCCUPANCY & EXITING LEGEND

OCCUPANT LOAD ICON

OCCUPANCY: B → OCCUPANCY TYPE
OFFICE → SPACE NAME
BUSINESS → FUNCTION OF SPACE
2550 SF → OCCUPANT LOAD FACTOR
100 → AREA IN SQUARE FT
→ NUMBER OF OCCUPANTS
WHERE APPLICABLE →

EGRESS WIDTH ICON

0 → NUMBER OF OCCUPANTS USING EXIT
160 → MAXIMUM NUMBER OF OCCUPANTS ALLOWED THROUGH DOOR PER 1005.3.2:
32" CLEAR DOOR WIDTH / 2 = 160 OCC.;
64" CLEAR WIDTH / 2 = 320 OCC.

ALLOWABLE COMMON PATH OF TRAVEL DISTANCE

COMMON PATH OF EGRESS TRAVEL (1006.2.1). THE DISTANCE TO POINT WHERE TWO EXIT PATHS ARE AVAILABLE:
A=75', A=75' (SPRINKLERED BLDG)

ALLOWABLE MAXIMUM TRAVEL DISTANCE

MAXIMUM EXIT ACCESS TRAVEL DISTANCE (TABLE 1017.2), TO NEAREST EXTERIOR EGRESS DOOR OR VERTICAL EXIT ENCLOSURE NOT TO EXCEED:
A=200', A=250' (SPRINKLERED BLDG)

0 → ACTUAL COMMON PATH TRAVEL DISTANCE
0 → ACTUAL MAXIMUM TRAVEL DISTANCE TO NEAREST EXIT

12' → COMMON PATH OF TRAVEL (1006.2.1)
12' → TWO EXIT OPTIONS

→ → DIRECTION OF TRAVEL

● → END OF COMMON PATH OF TRAVEL

----- → OCCUPANCY/ INCIDENTAL USE BOUNDARIES

FIRE EXTINGUISHERS

OFFICE AREAS: LIGHT HAZARD
WAREHOUSE/SHOP AREAS: ORDINARY HAZARD
TYPE AND SIZE: 2A:10BC, 10 LB.
CABINET, WHERE OCCURS: NON-LOCKING, PARTIAL GLASS FRONT
MOUNTING HEIGHT: 48" TO TOP OF EXTINGUISHER
LOCATIONS: SEE FLOOR PLAN

EXIT SIGNS:

HATCH INDICATES DIRECTION OF TRAVEL
REFER TO ELECTRICAL DRAWINGS FOR EXIT SIGN LOCATIONS

////// → MEANS OF EGRESS ILLUMINATION WITH EMERGENCY POWER (SECTION 1008.3), SEE ELEC.

* → ASTERISK DESIGNATES SPACE EXCLUDED FROM OCCUPANT LOAD IN ASSEMBLY (A) OCCUPANCY IN ACCORDANCE WITH THE DEFINITION OF "FLOOR AREA, NET" OSSC CHAPTER 2

* **TWO EXITS REQUIRED IF:**
- DESIGN OCCUPANT LOAD OR COMMON PATH EXCEEDS TABLE 1006.2.1

* **MAX. DEAD END CORRIDOR (1020.4) = 50' - 0"**
(SPRINKLED B, S, M)

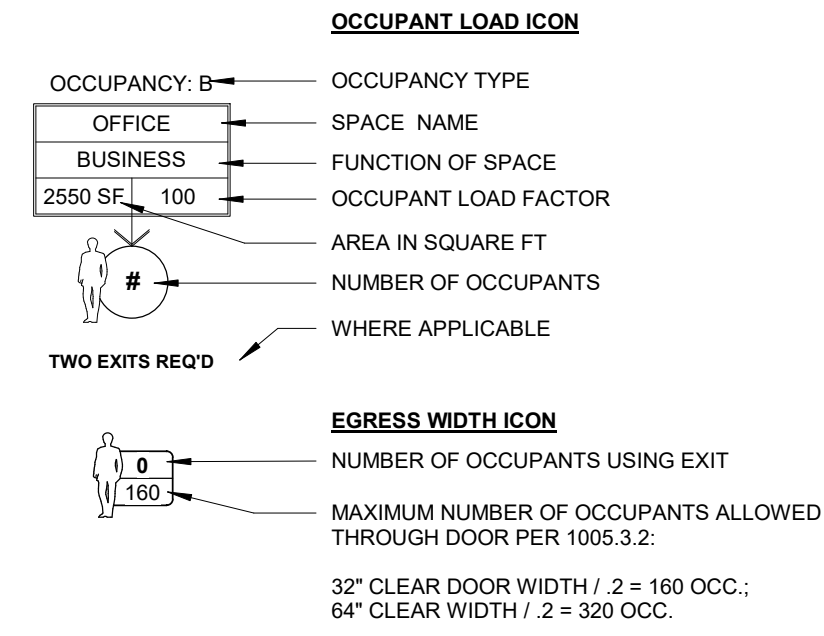
* **CORRIDORS: NO RATING IN SPRINKLED BUILDING (1020)**

■ → AREA NOT IN SCOPE OF WORK



1 LIFESAFETY PLAN - OVERALL
1/32" = 1'-0"

OCCUPANCY & EXITING LEGEND

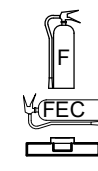
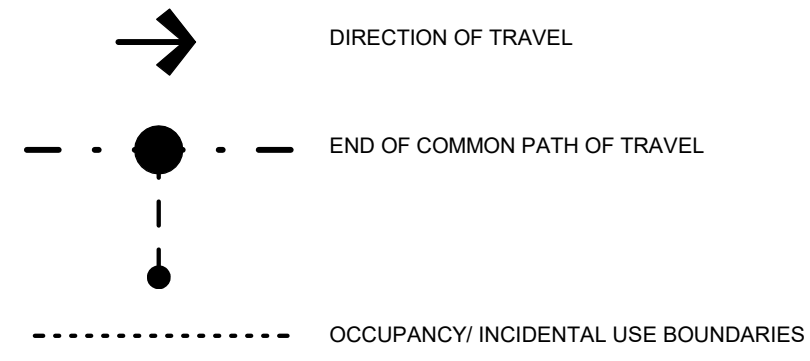
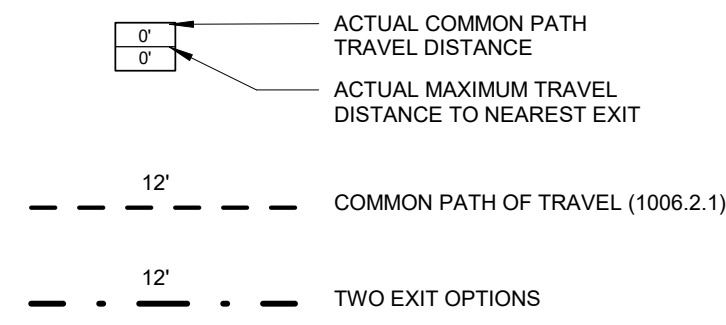


ALLOWABLE COMMON PATH OF TRAVEL DISTANCE

COMMON PATH OF EGRESS TRAVEL (1006.2.1), THE DISTANCE TO POINT WHERE TWO EXIT PATHS ARE AVAILABLE:
 B = 100' (SPRINKLERED BLDG)

ALLOWABLE MAXIMUM TRAVEL DISTANCE

MAXIMUM EXIT ACCESS TRAVEL DISTANCE (TABLE 1017.2), TO NEAREST EXTERIOR EGRESS DOOR OR VERTICAL EXIT ENCLOSURE NOT TO EXCEED:
 B = 300' (SPRINKLERED BLDG)



FIRE EXTINGUISHERS

OFFICE AREAS: LIGHT HAZARD
 WAREHOUSE/SHOP AREAS: ORDINARY HAZARD
 TYPE AND SIZE: 2A:10BC, 10 LB.
 CABINET, WHERE OCCURS: NON-LOCKING, PARTIAL GLASS FRONT
 MOUNTING HEIGHT: 48" TO TOP OF EXTINGUISHER
 LOCATIONS: SEE FLOOR PLAN



EXIT SIGNS:

HATCH INDICATES DIRECTION OF TRAVEL



MEANS OF EGRESS ILLUMINATION WITH EMERGENCY POWER (SECTION 1008.3), SEE ELEC.

*** TWO EXITS REQUIRED IF:**
 - DESIGN OCCUPANT LOAD OR COMMON PATH EXCEEDS TABLE 1006.2.1

*** MAX. DEAD END CORRIDOR (1020.4) = 50' - 0"**
 (SPRINKLED B, S, M)

*** CORRIDORS: NO RATING IN SPRINKLED BUILDING (1020)**

BUILDING CODE INFORMATION

CITY MANAGER'S OFFICE
TOTAL OCCUPANT LOAD:
 21

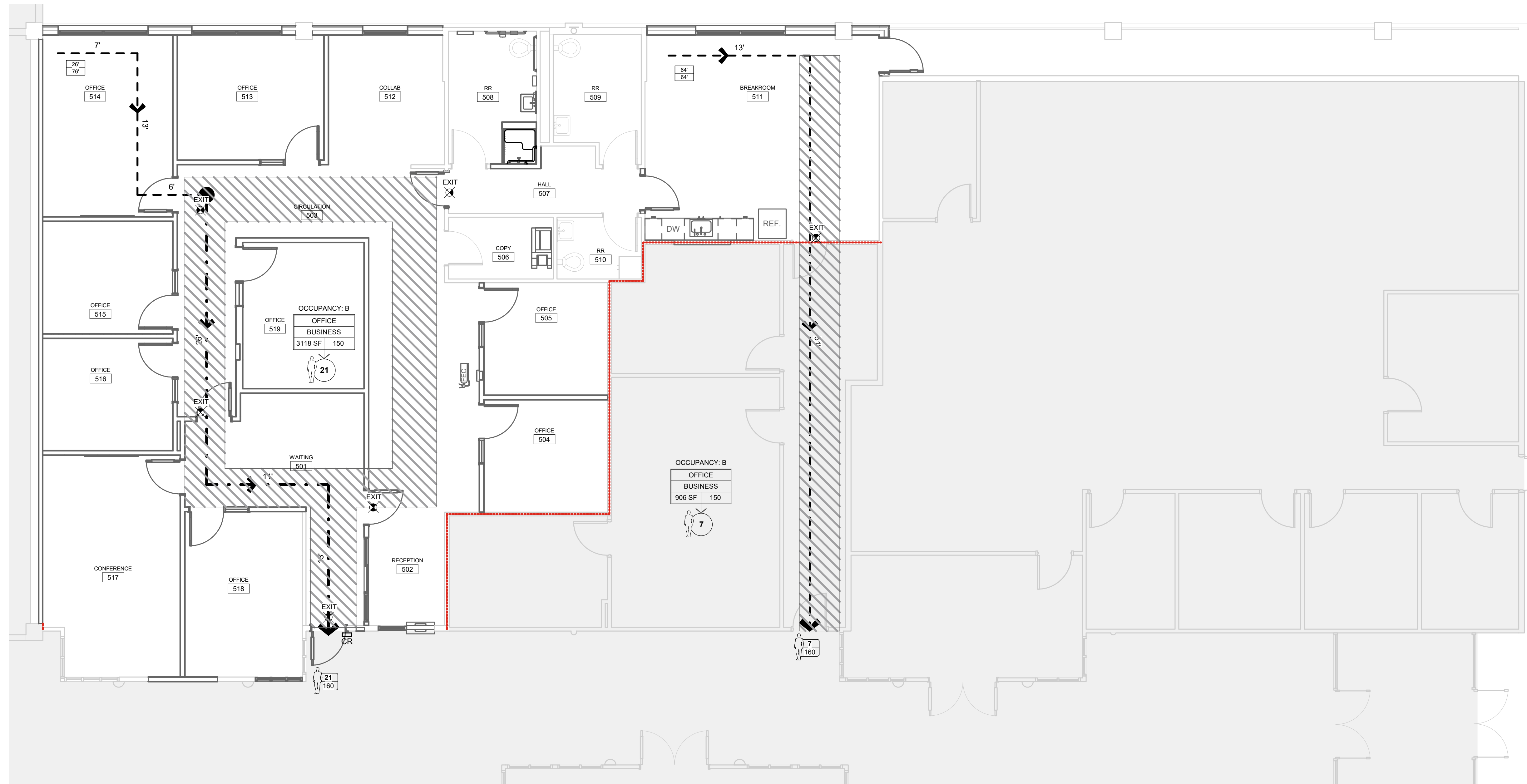
ADDRESS:
 225 5TH STREET
 SPRINGFIELD, OR 97477

MAP AND TAX LOT:
 MAP 17033531, TAX LOT 3300

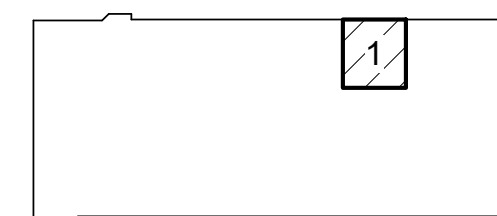
AUTOMATIC SPRINKLER SYSTEM:
 YES

FIRE ALARM:
 EXISTING THROUGHOUT FLOOR

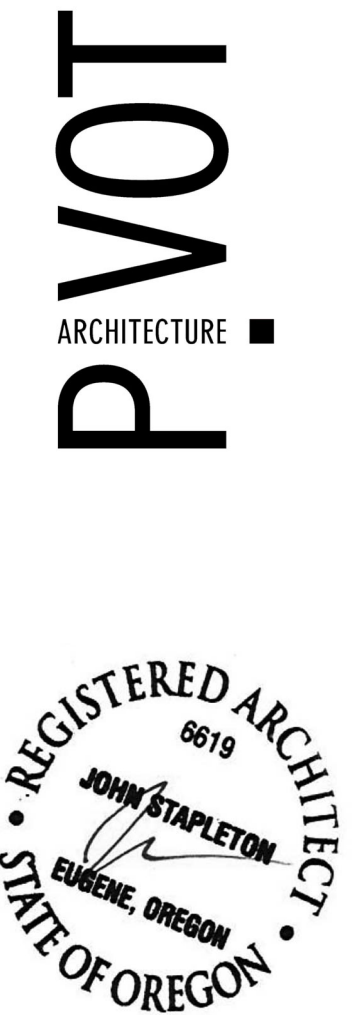
NO CHANGES TO THE FOLLOWING:
 OCCUPANCY TYPE
 MAIN BUILDING EGRESS PATHWAY
 MAIN BUILDING EGRESS SYSTEM
 CONSTRUCTION TYPE



1 LIFE SAFETY PLAN - CM OFFICE
 3/16" = 1'-0"



KEYPLAN



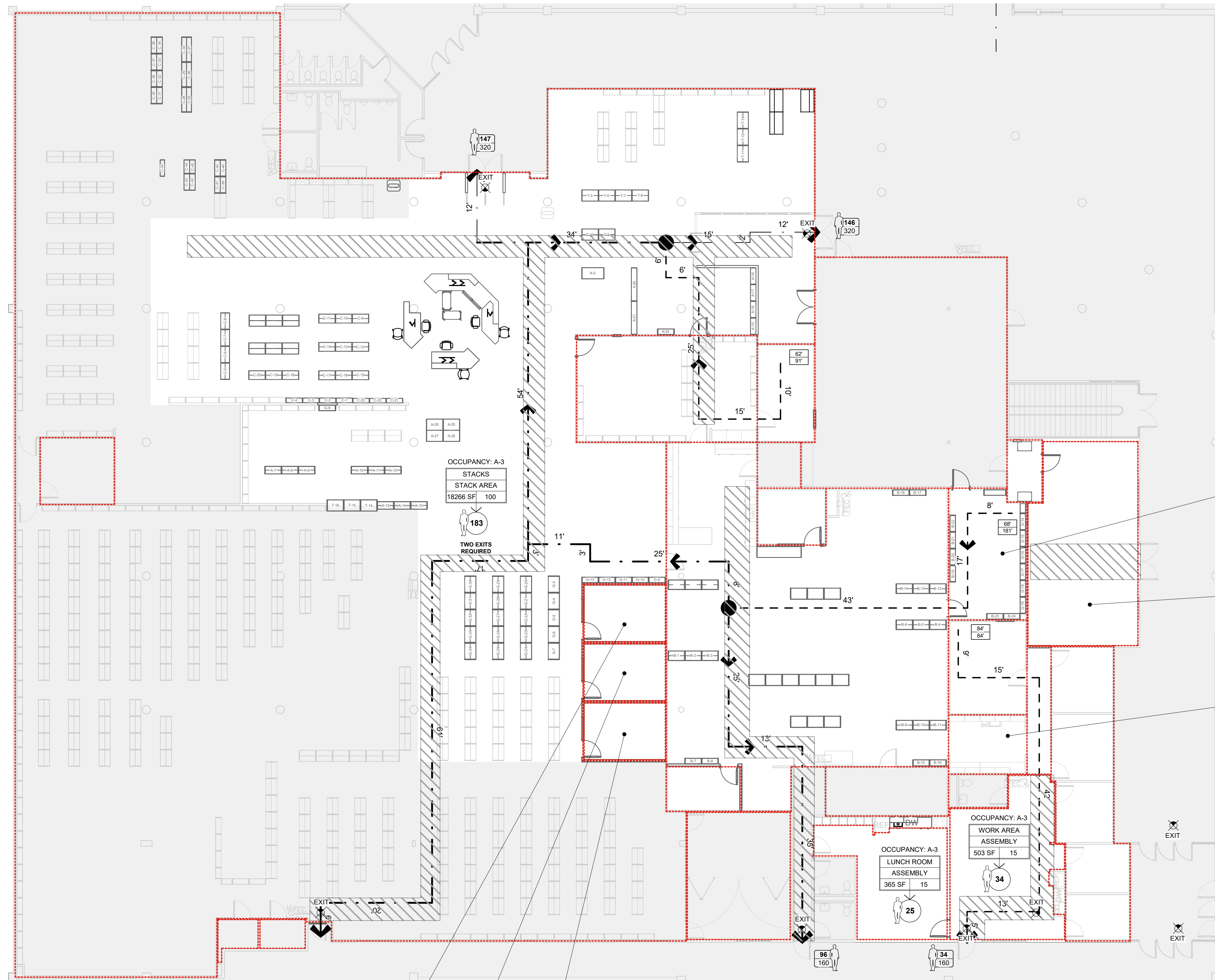
CONSTRUCTION DRAWINGS
SPRINGFIELD CITY HALL RENOVATION
 PROJECT #: 2125.00
 CITY OF SPRINGFIELD
 225 5TH STREET SPRINGFIELD, OR 97477

SHEET TITLE:
LIFE SAFETY PLAN - CM OFFICE

REVISIONS:
 # DESCRP. DATE

ISSUE DATE: 09.28.2023

G012



OCCUPANCY: A-3 MEETING ASSEMBLY 148 SF 15	OCCUPANCY: A-3 MEETING ASSEMBLY 149 SF 15	OCCUPANCY: A-3 MEETING ASSEMBLY 149 SF 15	FORMER OCCUPANCY: STACKS OCCUPANCY CHANGE: INCREASED BY 24
-------------------------------------------------	-------------------------------------------------	-------------------------------------------------	------------------------------------------------------------------

OCCUPANCY: A-3 STORAGE 324 SF 300	FORMER OCCUPANCY: CONFERENCE ROOM OCCUPANCY CHANGE: DECREASE BY 20
OCCUPANCY: A-3 CONFERENCE ASSEMBLY 893 SF 15	FORMER OCCUPANCY: RECEPTION AND OFFICE OCCUPANCY CHANGE: 0
OCCUPANCY: A-3 WORKROOM STORAGE 150 SF 300	FORMER OCCUPANCY: STORAGE OCCUPANCY CHANGE: 0

1 LIFE SAFETY PLAN - LIBRARY

3/32" = 1'-0"

OCCUPANCY & EXITING LEGEND

OCCUPANT LOAD ICON

OCCUPANCY: B → OCCUPANCY TYPE
 OFFICE → SPACE NAME
 BUSINESS → FUNCTION OF SPACE
 2550 SF 100 → OCCUPANT LOAD FACTOR
 # → AREA IN SQUARE FT
 # → NUMBER OF OCCUPANTS
 TWO EXITS REQ'D → WHERE APPLICABLE

EGRESS WIDTH ICON

0/160 → NUMBER OF OCCUPANTS USING EXIT
 MAXIMUM NUMBER OF OCCUPANTS ALLOWED THROUGH DOOR PER 1005.3.2:
 32" CLEAR DOOR WIDTH / 2 = 160 OCC.;
 64" CLEAR WIDTH / 2 = 320 OCC.

ALLOWABLE COMMON PATH OF TRAVEL DISTANCE

COMMON PATH OF EGRESS TRAVEL (1006.2.1). THE DISTANCE TO POINT WHERE TWO EXIT PATHS ARE AVAILABLE:
 A=75', A=75' (SPRINKLERED BLDG)

ALLOWABLE MAXIMUM TRAVEL DISTANCE

MAXIMUM EXIT ACCESS TRAVEL DISTANCE (TABLE 1017.2), TO NEAREST EXTERIOR EGRESS DOOR OR VERTICAL EXIT ENCLOSURE NOT TO EXCEED:
 A=200', A=250' (SPRINKLERED BLDG)

ACTUAL COMMON PATH TRAVEL DISTANCE
 ACTUAL MAXIMUM TRAVEL DISTANCE TO NEAREST EXIT

12' → COMMON PATH OF TRAVEL (1006.2.1)
 12' → TWO EXIT OPTIONS
 → → DIRECTION OF TRAVEL
 ● → END OF COMMON PATH OF TRAVEL
 --- --- OCCUPANCY/ INCIDENTAL USE BOUNDARIES

FIRE EXTINGUISHERS

OFFICE AREAS: LIGHT HAZARD
 WAREHOUSE/SHOP AREAS: ORDINARY HAZARD
 TYPE AND SIZE: 2A:10BC, 10 LB.
 CABINET, WHERE OCCURS: NON-LOCKING, PARTIAL GLASS FRONT
 MOUNTING HEIGHT: 48" TO TOP OF EXTINGUISHER
 LOCATIONS: SEE FLOOR PLAN

EXIT SIGNS:

EXIT → HATCH INDICATES DIRECTION OF TRAVEL
 REFER TO ELECTRICAL DRAWINGS FOR EXIT SIGN LOCATIONS

MEANS OF EGRESS ILLUMINATION WITH EMERGENCY POWER (SECTION 1008.3), SEE ELEC.

* → ASTERISK DESIGNATES SPACE EXCLUDED FROM OCCUPANT LOAD IN ASSEMBLY (A) OCCUPANCY IN ACCORDANCE WITH THE DEFINITION OF "FLOOR AREA, NET" OSSC CHAPTER 2

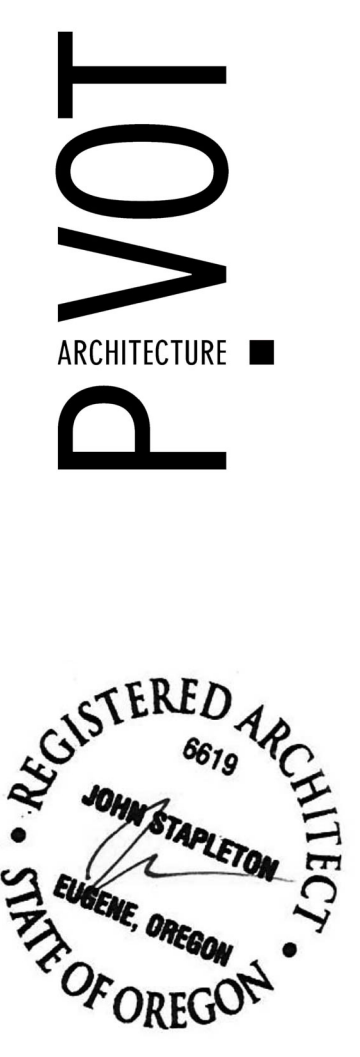
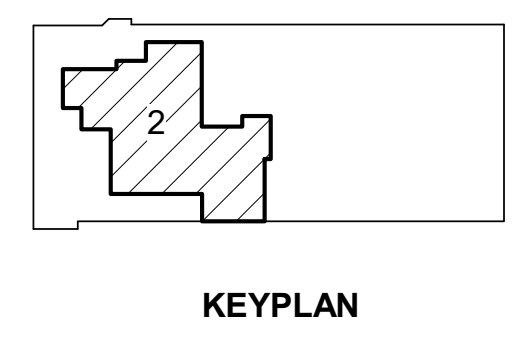
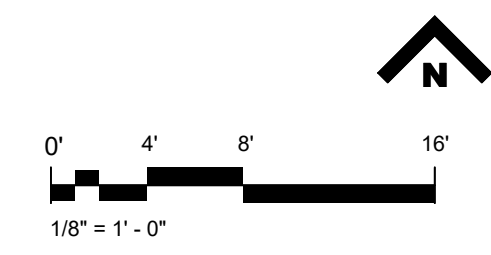
TWO EXITS REQUIRED IF:

- DESIGN OCCUPANT LOAD OR COMMON PATH EXCEEDS TABLE 1006.2.1
- MAX. DEAD END CORRIDOR (1020.4) = 50' - 0" (SPRINKLERED B, S, M)
- CORRIDORS: NO RATING IN SPRINKLERED BUILDING (1020)

AREA NOT IN SCOPE OF WORK

BUILDING CODE INFORMATION

LIBRARY
 TOTAL OCCUPANT LOAD NEW: 485
 TOTAL OCCUPANT LOAD EXISTING: 481



CONSTRUCTION DRAWINGS
 SPRINGFIELD CITY HALL RENOVATION
 PROJECT #: 2125.00
 CITY OF SPRINGFIELD
 225 5TH STREET SPRINGFIELD, OR 97477

SHEET TITLE:
LIFE SAFETY PLAN - LIBRARY

REVISIONS:
 # DESCRP. DATE

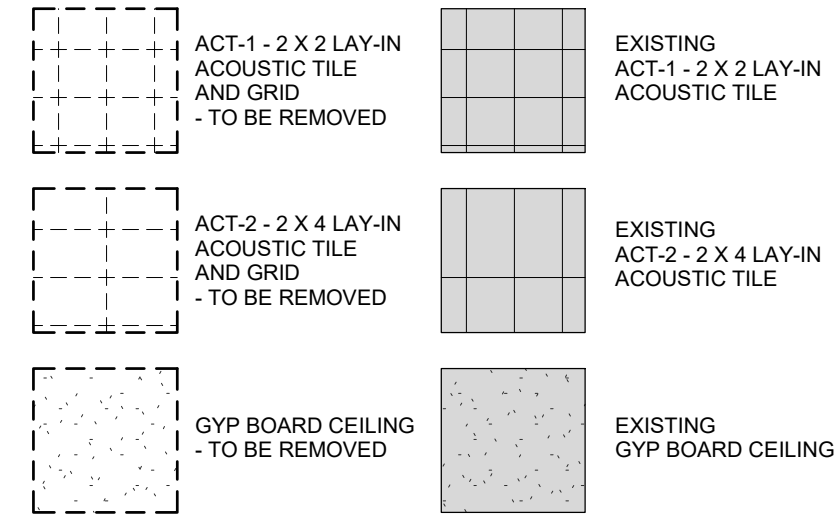
ISSUE DATE: 09.28.2023

G013

WALL PATTERNS



DEMOLITION LEGEND

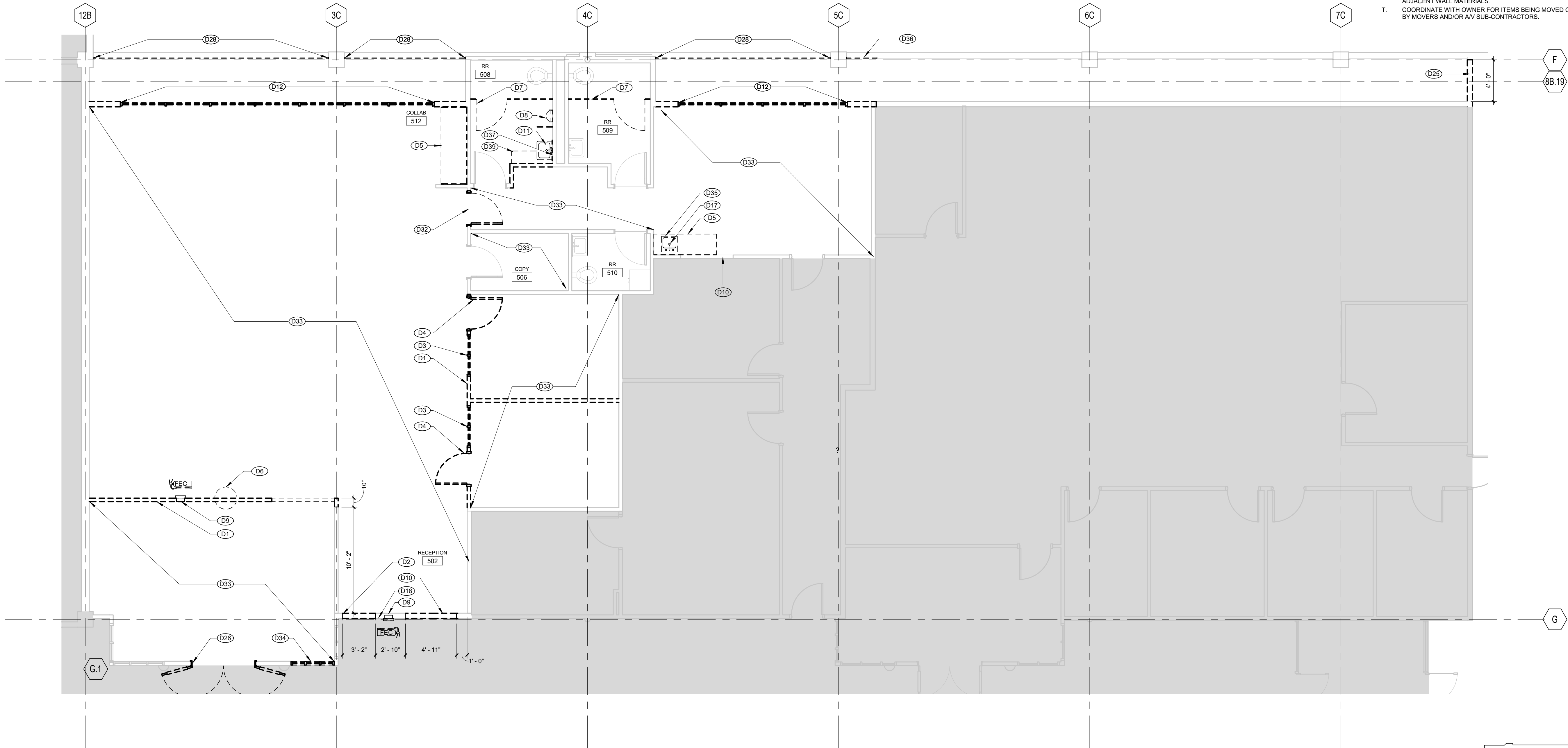


KEYNOTES

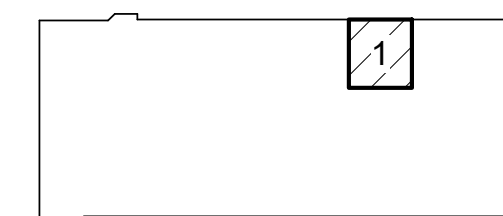
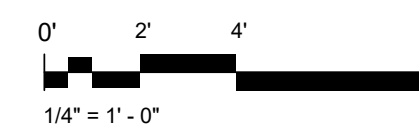
- D1 REMOVE (E) INTERIOR PARTITION
- D2 REMOVE INDICATED PORTION OF (E) INTERIOR PARTITION FOR NEW DOOR AND FRAME
- D3 REMOVE (E) HOLLOW METAL FRAME AND GLAZING
- D4 REMOVE (E) DOOR AND FRAME
- D5 REMOVE (E) CASEWORK
- D6 REMOVE AND SALVAGE (E) BREAKER BOX
- D7 REMOVE (E) TOILET PARTITION
- D8 REMOVE (E) URINAL AND PARTITION. RELOCATE PLUMBING ALONG WALL TO NEW FIXTURES
- D9 REMOVE AND SALVAGE (E) FIRE EXTINGUISHER CABINET
- D10 REMOVE INDICATED PORTION OF (E) INTERIOR PARTITION FOR NEW WINDOW
- D11 RELOCATE (E) SINK
- D12 REMOVE (E) EXTERIOR WALL AND GLAZING
- D17 REMOVE (E) SINK
- D18 REMOVE (E) FIRE ALARM PULL STATION
- D25 SAW CUT AND REMOVE (E) WOOD STUD WALL. VERIFY IN FIELD
- D26 REMOVE (E) DOOR AND FRAME. SALVAGE DOOR PANEL TO BE REUSED.
- D28 REMOVE (E) RAILING
- D32 REMOVE (E) DOOR PANEL. HOLLOW METAL FRAME TO REMAIN.
- D33 REMOVE (E) FLOORING
- D34 REMOVE (E) HOLLOW METAL FRAME AND GLAZING AND REPLACE WITH SALVAGED WINDOW FROM LIBRARY. SEE DEMO PLANS
- D35 RELOCATE PLUMBING ALONG WALL TO NEW SINK LOCATION
- D36 CUT (E) RAILING TO ACCOMMODATE NEW BUILDING WALLS. MODIFY RAILING TO REATTACH TO BUILDING.
- D37 REMOVE PORTION OF DRYWALL FOR SHOWER. SEE FLOOR PLAN FOR DIMENSIONS.
- D39 REMOVE INDICATED PORTION OF (E) TILE

GENERAL NOTES - DEMOLITION

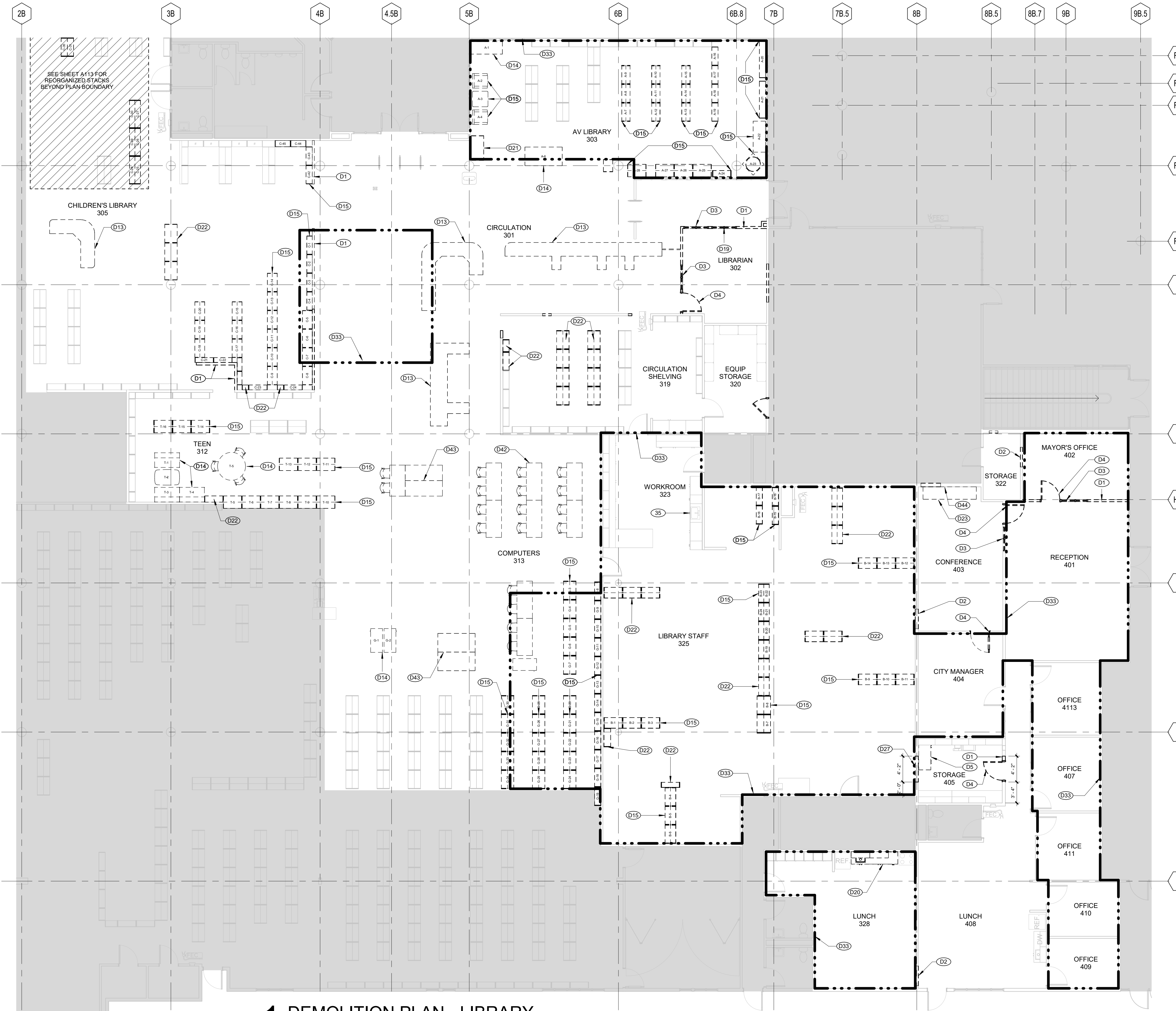
- A. THE ADJACENT EXISTING FACILITIES SHALL REMAIN IN FULL OPERATION DURING DEMOLITION AND DURING ALL CONSTRUCTION WORK.
- B. MAINTAIN SAFE ACCESS TO AND EGRESS FROM THE BUILDING AT ALL TIMES. DO NOT BLOCK ANY REQUIRED EXIT PATHS.
- C. PREVENT INTERRUPTION IN UTILITIES OR SERVICES THAT WOULD INCONVENIENCE BUILDING OCCUPANTS.
- D. COORDINATE WITH THE OWNER TO MAINTAIN CONTINUITY OF OWNER'S OPERATIONS.
- E. PROTECT ALL EXISTING CONSTRUCTION TO REMAIN.
- F. COORDINATE WITH OWNER FOR REMOVAL AND STORAGE OF (E) EQUIPMENT AND CASEWORK TO BE SALVAGED.
- G. REMOVE EXISTING DOOR WALL STOPS WHERE DOORS NO LONGER EXIST.
- H. REMOVE ALL (E) HOOKS, ANCHORS AND OTHER WALL-MOUNTED ITEMS NOT TO BE REUSED.
- I. PROTECT (E) FLOORS, WALLS, CEILINGS & FINISHES TO REMAIN.
- J. REMOVE AND STORE MATERIAL AND EQUIPMENT WHERE INDICATED TO BE SALVAGED OR RELOCATED.
- K. WHEN REMOVING FLOOR FINISHES REMOVE ALL ADHESIVE, GROUT, RESIDUE AND DEBRIS.
- L. REMOVE ALL EXISTING SUSPENDED ACOUSTICAL CEILING TILES WITHIN WORK AREA BEFORE DEMOLITION BEGINS. STORE UNDAMAGED TILE FOR REUSE.
- M. REMOVE PORTIONS OF THE EXISTING SUSPENDED CEILING GRID IN ORDER TO ACCESS ABOVE CEILING AREAS AS NEEDED TO ACCOMPLISH WORK OF THIS CONTRACT.
- N. AT CEILINGS SCHEDULED FOR REMOVAL, REMOVE CEILING SYSTEM INCLUDING BUT NOT LIMITED TO GRID, TILE, AND SUPPORT SYSTEM IF NOT REUSABLE, TO ALLOW FOR NEW CONSTRUCTION.
- O. SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR ADDITIONAL DEMOLITION SCOPE.
- P. DEMOLISH EXISTING WALL AND CEILING FINISHES AS REQUIRED TO ACCOMMODATE MECHANICAL, ELECTRICAL, AND PLUMBING WORK.
- Q. COORDINATE WITH OWNER'S MODULAR SYSTEMS FURNITURE CONTRACTOR FOR CHANGES TO FURNITURE AND SYSTEM CASEWORK.
- R. FOR LIBRARY SCOPE, AT AREAS WHERE CASEWORK IS REMOVED, PREPARE FLOOR FOR NEW CARPET.
- S. PATCH AND REPAIR WALL AREAS WHERE TOILET PARTITIONS, AND OTHER WALL MOUNTED ITEMS WERE REMOVED. MATCH EXISTING ADJACENT WALL MATERIALS.
- T. COORDINATE WITH OWNER FOR ITEMS BEING MOVED OR RELOCATED BY MOVERS AND/OR A/V SUB-CONTRACTORS.



1 DEMOLITION PLAN - CM OFFICE
3/16" = 1'-0"



KEYPLAN



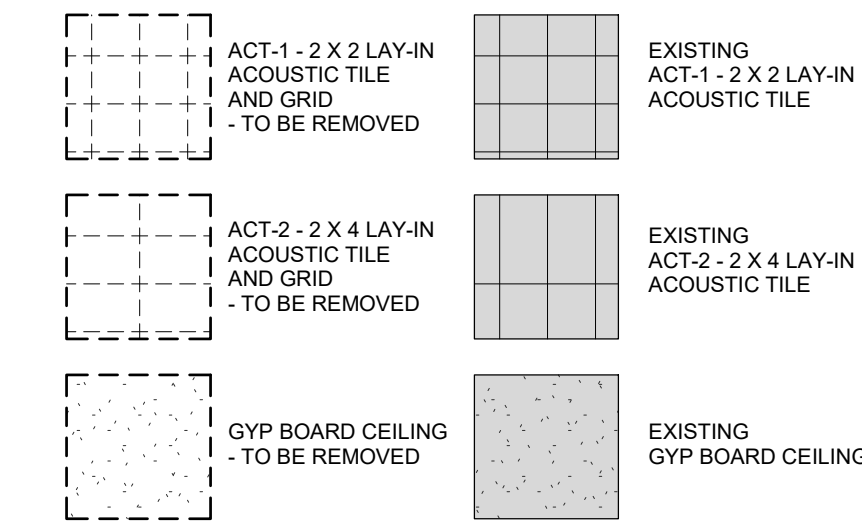
GENERAL NOTES - DEMOLITION

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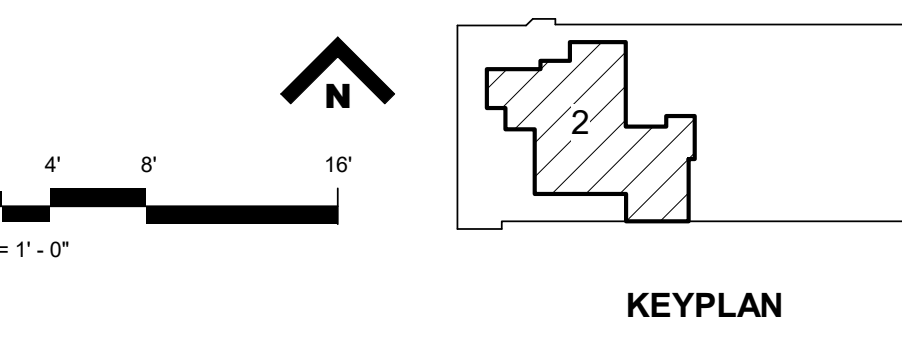
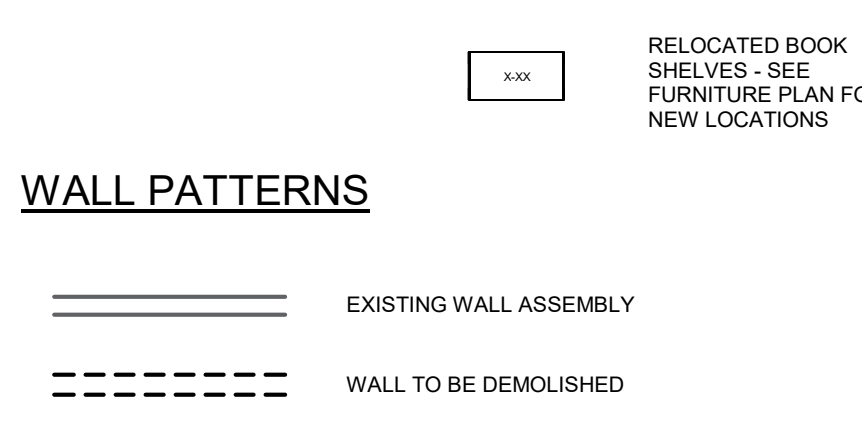
KEYNOTES

- 35 EXISTING CASEWORK AND SINK TO REMAIN
- D1 REMOVE (E) INTERIOR PARTITION
- D2 REMOVE INDICATED PORTION OF (E) INTERIOR PARTITION FOR NEW DOOR AND FRAME
- D3 REMOVE (E) HOLLOW METAL FRAME AND GLAZING
- D4 REMOVE (E) DOOR AND FRAME
- D5 REMOVE (E) CASEWORK
- D13 REMOVE (E) CIRCULATION DESK
- D14 RELOCATE (E) FURNITURE, SEE FURNITURE PLAN FOR NEW LOCATION
- D15 RELOCATE (E) BOOKSHELVES, SEE FLOOR PLAN FOR NEW LOCATION
- D19 SALVAGE (E) WINDOW TO BE USED IN MAYOR'S OFFICE
- D20 ADD ALL - REMOVE (E) CASEWORK AND SINK
- D21 RELOCATE (E) DISPLAY, SEE FLOOR PLAN FOR NEW LOCATION
- D22 DIS-ASSEMBLE (E) BOOKSHELVES AND SALVAGE
- D23 COORDINATE WITH OWNER FOR STORAGE LOCATIONS
- D24 SALVAGE (E) CASEWORK TO BE USED IN CITY MANAGER'S OFFICE BREAK ROOM
- D27 REMOVE INDICATED PORTION OF (E) INTERIOR PARTITION FOR NEW FRAMED OPENING
- D33 REMOVE (E) FLOORING
- D42 RELOCATE AND REARRANGE PER FURNITURE PLAN, COORDINATE WITH OWNER
- D43 RELOCATE (E) FURNITURE, COORDINATE WITH OWNER FOR NEW LOCATIONS
- D44 RELOCATE (E) AV EQUIPMENT TO NEW CMO CONFERENCE ROOM. SEE FLOOR PLANS FOR NEW LOCATION

DEMOLITION LEGEND



WALL PATTERNS



1 DEMOLITION PLAN - LIBRARY
1/8" = 1'-0"



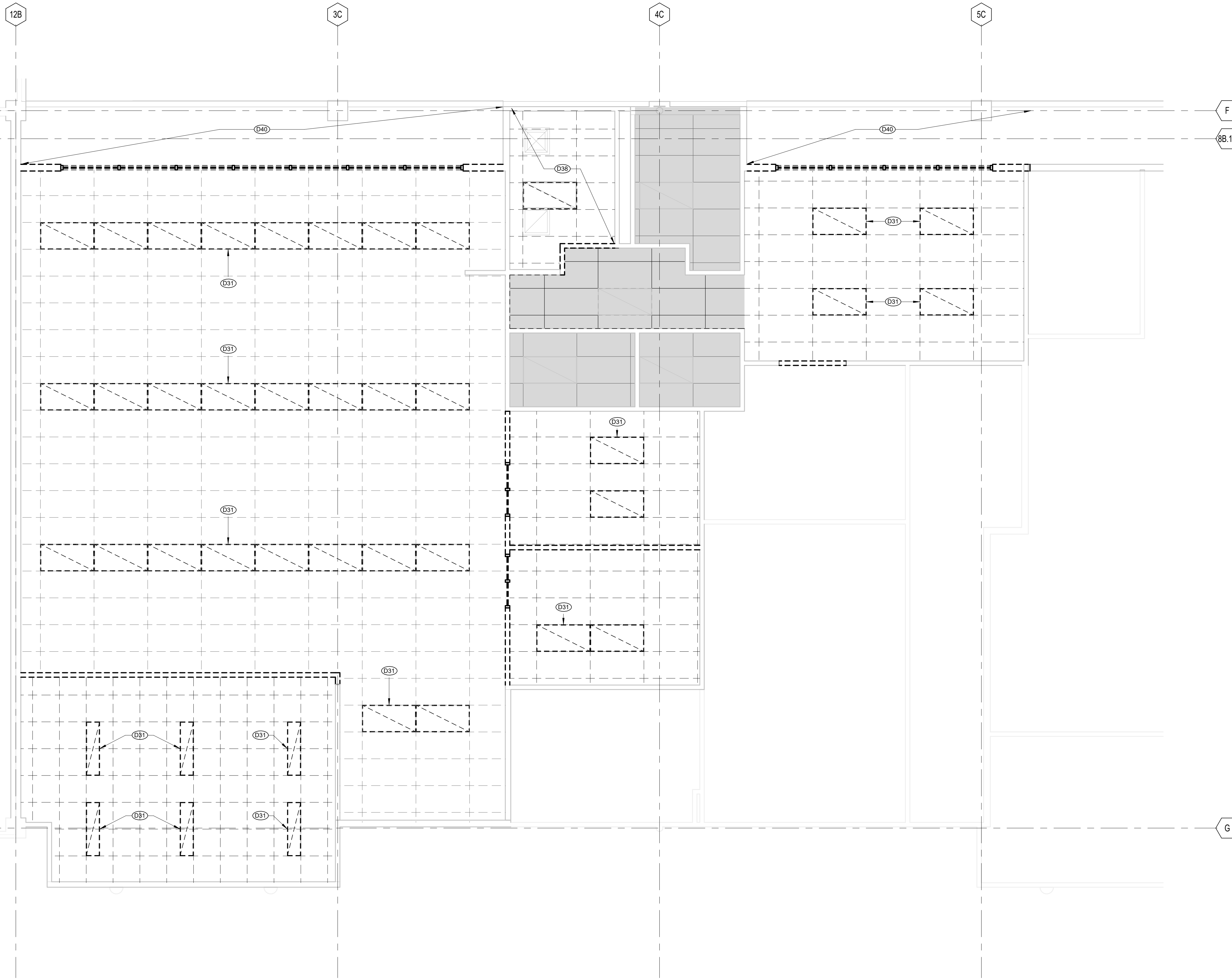
CONSTRUCTION DRAWINGS
 SPRINGFIELD CITY HALL RENOVATION
 PROJECT #: 2125.00
 CITY OF SPRINGFIELD
 225 5TH STREET SPRINGFIELD, OR 97477

SHEET TITLE:
DEMOLITION PLAN - LIBRARY

REVISIONS:
 # DESCRP. DATE

ISSUE DATE: 09.28.2023

D112



GENERAL NOTES - DEMOLITION

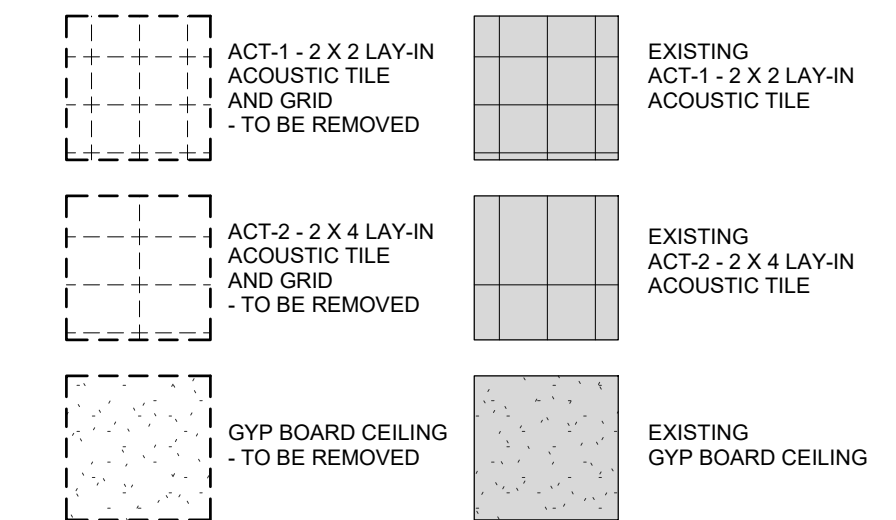
- A. THE ADJACENT EXISTING FACILITIES SHALL REMAIN IN FULL OPERATION DURING DEMOLITION AND DURING ALL CONSTRUCTION WORK.
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- M. REMOVE PORTIONS OF THE EXISTING SUSPENDED CEILING GRID IN ORDER TO ACCESS ABOVE CEILING AREAS AS NEEDED TO ACCOMPLISH WORK OF THIS CONTRACT.
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- P. DEMOLISH EXISTING WALL AND CEILING FINISHES AS REQUIRED TO ACCOMMODATE MECHANICAL, ELECTRICAL AND PLUMBING WORK.
- Q. COORDINATE WITH OWNER'S MODULAR SYSTEMS FURNITURE CONTRACTOR FOR CHANGES TO FURNITURE AND SYSTEM CASEWORK.
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KEYNOTES - SPECIFICATION

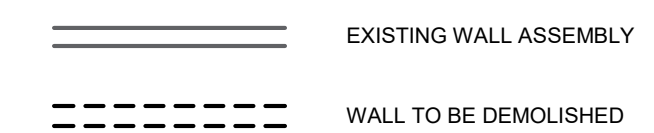
KEYNOTES

- D31 REMOVE (E) LIGHT FIXTURE
- D38 REMOVE EXISTING CEILING TILES

DEMOLITION LEGEND

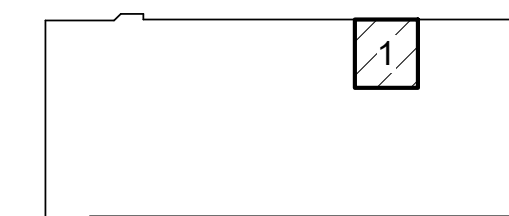
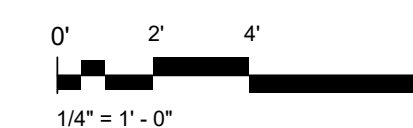


WALL PATTERNS



1 DEMOLITION RCP - CM OFFICE

1/4" = 1'-0"



KEYPLAN

2B

3B

4B

4.5B

5B

6B

6B.8

7B

7B.5

8B

8B.5

8B.7

9B

9B.5

F.3

F.4

F.5

F.7

F.9

G

H

H.5

J

K

L

GENERAL NOTES - DEMOLITION

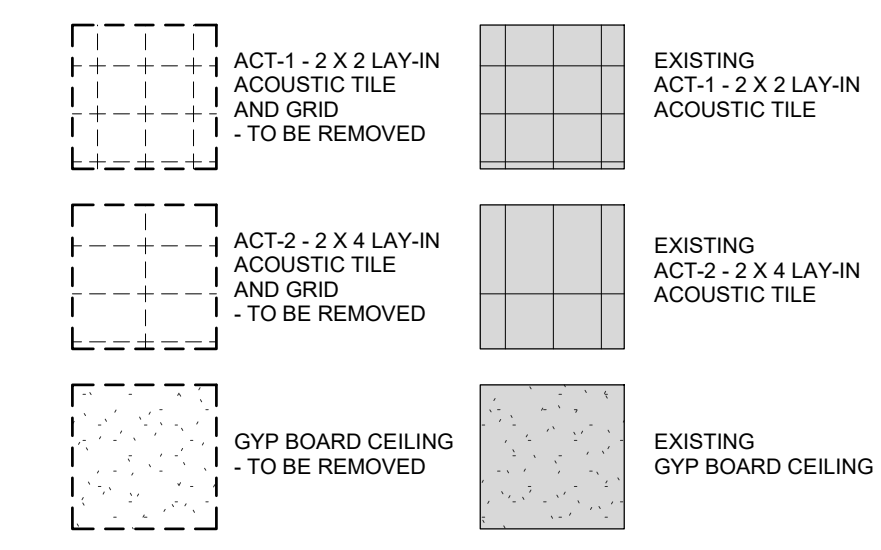
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- E. PROTECT ALL EXISTING CONSTRUCTION TO REMAIN.
- F. COORDINATE WITH OWNER FOR REMOVAL AND STORAGE OF (E) EQUIPMENT AND CASEWORK TO BE SALVAGED.
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- H. REMOVE ALL (E) HOOKS, ANCHORS AND OTHER WALL-MOUNTED ITEMS NOT TO BE REUSED.
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- M. REMOVE PORTIONS OF THE EXISTING SUSPENDED CEILING GRID IN ORDER TO ACCESS ABOVE CEILING AREAS AS NEEDED TO ACCOMPLISH WORK OF THIS CONTRACT.
- N. AT CEILINGS SCHEDULED FOR REMOVAL, REMOVE CEILING SYSTEM INCLUDING BUT NOT LIMITED TO GRID, TILE, AND SUPPORT SYSTEM IF NOT REUSABLE, TO ALLOW FOR NEW CONSTRUCTION.
- O. SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR ADDITIONAL DEMOLITION SCOPE.
- P. DEMOLISH EXISTING WALL AND CEILING FINISHES AS REQUIRED TO ACCOMMODATE MECHANICAL, ELECTRICAL, AND PLUMBING WORK.
- Q. COORDINATE WITH OWNER'S MODULAR SYSTEMS FURNITURE CONTRACTOR FOR CHANGES TO FURNITURE AND SYSTEM CASEWORK FOR LIBRARY SCOPE. AT AREAS WHERE CASEWORK IS REMOVED, PREPARE FLOOR FOR NEW CARPET.
- R. PATCH AND REPAIR WALL AREAS WHERE TOILET PARTITIONS, AND OTHER WALL MOUNTED ITEMS WERE REMOVED. MATCH EXISTING ADJACENT WALL MATERIALS.
- T. COORDINATE WITH OWNER FOR ITEMS BEING MOVED OR RELOCATED BY MOVERS AND/OR AV SUB-CONTRACTORS.

KEYNOTES - SPECIFICATION

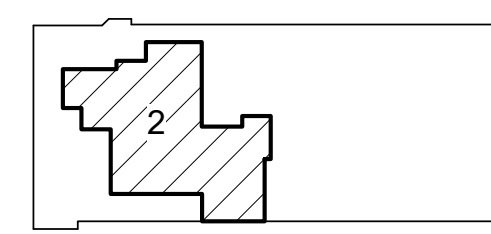
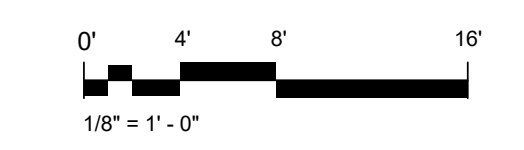
KEYNOTES

- D29 REMOVE INDICATED PORTION OF (E) ACT CEILING AND GRID
- D30 ADD ALL L-2. REMOVE (E) ACT CEILING TILES ONLY. ACT GRID TO REMAIN
- D31 REMOVE (E) LIGHT FIXTURE

DEMOLITION LEGEND



WALL PATTERNS



KEYPLAN

1 DEMOLITION RCP - LIBRARY

1/8" = 1'-0"



SHEET TITLE:
DEMOLITION CEILING PLAN - LIBRARY



REVISIONS:

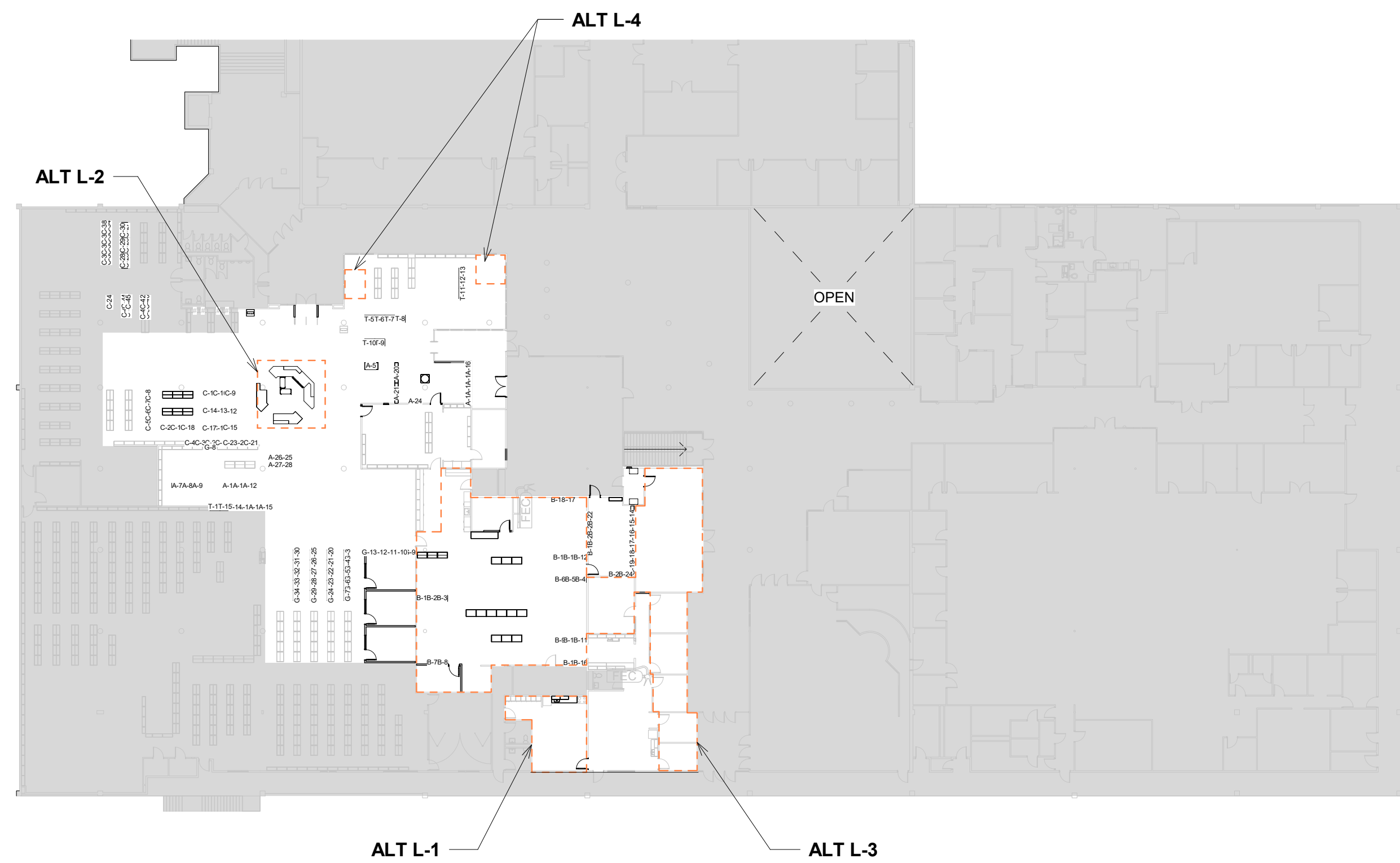
#	DESCRP.	DATE

GENERAL NOTES - FLOOR PLANS

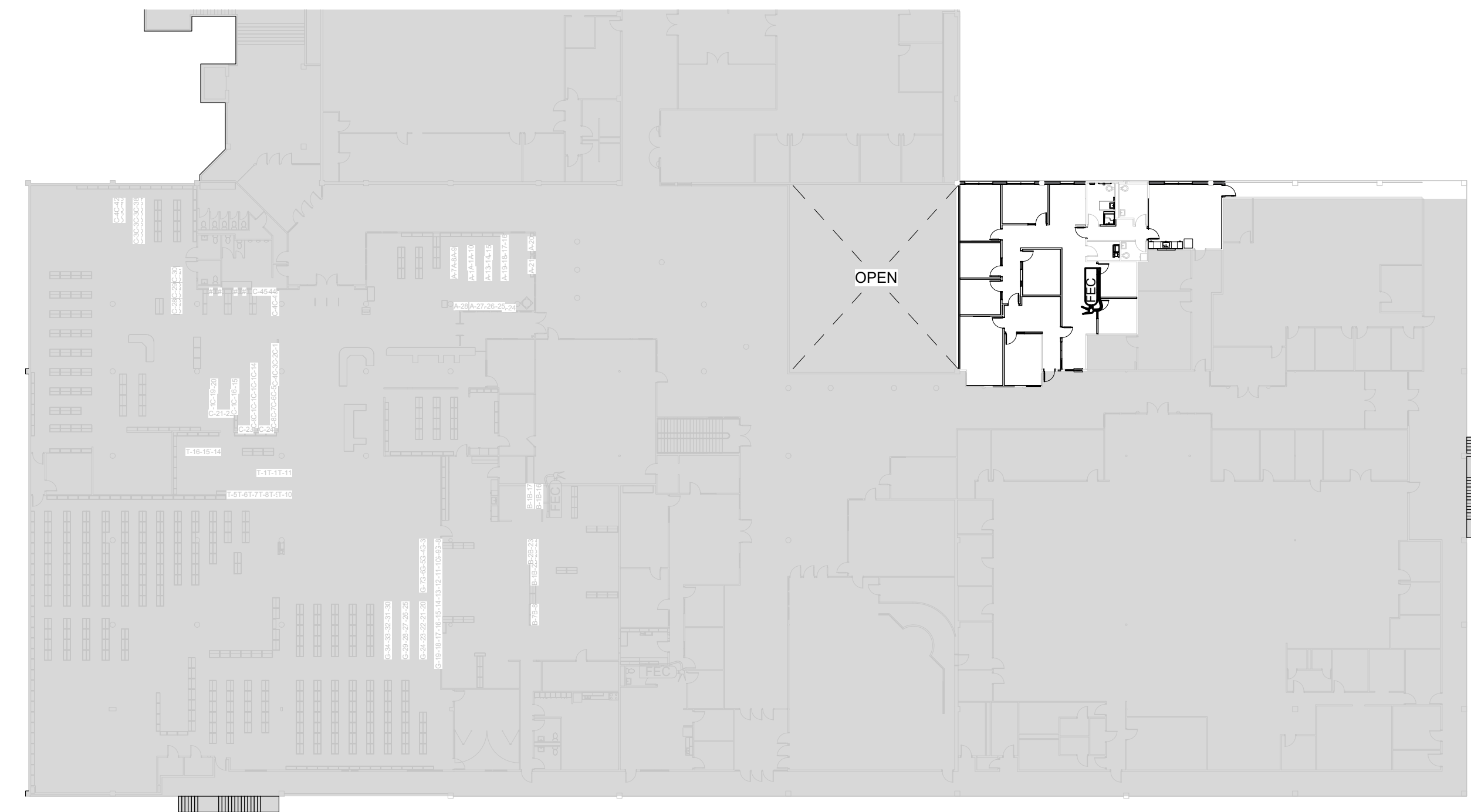
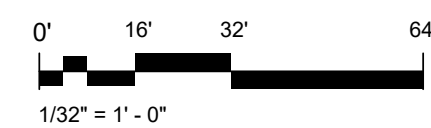
- A. DIMENSIONS SHOWN ARE TO THE FACE OF STUD, CONCRETE OR MASONRY UNLESS OTHERWISE NOTED. CONTACT THE ARCHITECT FOR ANY ADDITIONAL DIMENSIONS REQUIRED TO LAY OUT THE WORK.
- B. REFER TO WALL ASSEMBLY INFORMATION FOR WALL CONSTRUCTION AND THICKNESS.
- C. ALL NEW WALLS, AND GYP. BD. CEILINGS IN WORK AREAS TO BE PAINTED.
- D. REPAIR PATCHED SURFACES THAT ARE DAMAGED, LIFTED, DISCOLORED, OR SHOWING OTHER IMPERFECTIONS DUE TO PATCHING WORK IF DEFECTS ARE DUE TO CONDITION OF SUBSTRATE. REPAIR SUBSTRATE PRIOR TO REPAIRING FINISH.
- E. WHERE (E) FLOOR IS TO REMAIN, PROTECT FROM DAMAGE. PATCH AND REPAIR ANY HOLES IN CONCRETE SLAB CAUSED BY DEMOLITION OF EXISTING WALLS, (I.E. WALL ANCHORS).
- F. PATCH AND REPAIR ANY WALL AND CEILING LOCATIONS WHERE EXISTING ELECTRICAL AND VOICE/DATA OUTLET, JUNCTION BOXES, AND SIMILAR WALL MOUNTED ITEMS ARE REMOVED OR ABANDONED WITHIN THE WORK AREA.
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- K. BOOKCASES AND SHELVES TO BE OFCI. COORDINATE WITH OWNER PRIOR ON MOVING AND SEQUENCING.
- L. SEE A540 FOR DIMENSIONS OF RESTROOM ACCESSORIES.
- M. SEE SHEET A802 - FURNITURE PLAN FOR BOOKSHELF LOCATION DIMENSIONS

FLOOR PLAN LEGEND

-  AREA NOT IN SCOPE OF WORK
-  ADD ALTERNATES, SEE FLOOR PLANS AND REFLECTED CEILING PLANS



2 PHASE 2 - LIBRARY
1/32" = 1'-0"

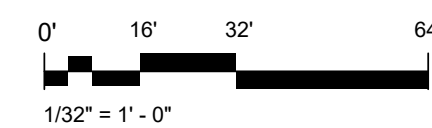


PHASING NOTE

THE WORK SHOWN IN THE AREA DESIGNATED AS PHASE 1, FOR THE CITY MANAGER OFFICE PROGRAM, SHOULD BE COMPLETED FIRST.

PHASE 2 AREA OF WORK MAY BE SEQUENCED ALONG WITH PHASE 1 AREA OF WORK AS REQUIRED FOR AN EFFICIENT AND LOGICAL PROGRESSION OF CONSTRUCTION.

1 PHASE 1 - CITY MANAGER OFFICE
1/32" = 1'-0"



CONSTRUCTION DRAWINGS
SPRINGFIELD CITY HALL RENOVATION
 PROJECT #: 2125.00
 CITY OF SPRINGFIELD
 225 5TH STREET SPRINGFIELD, OR 97477

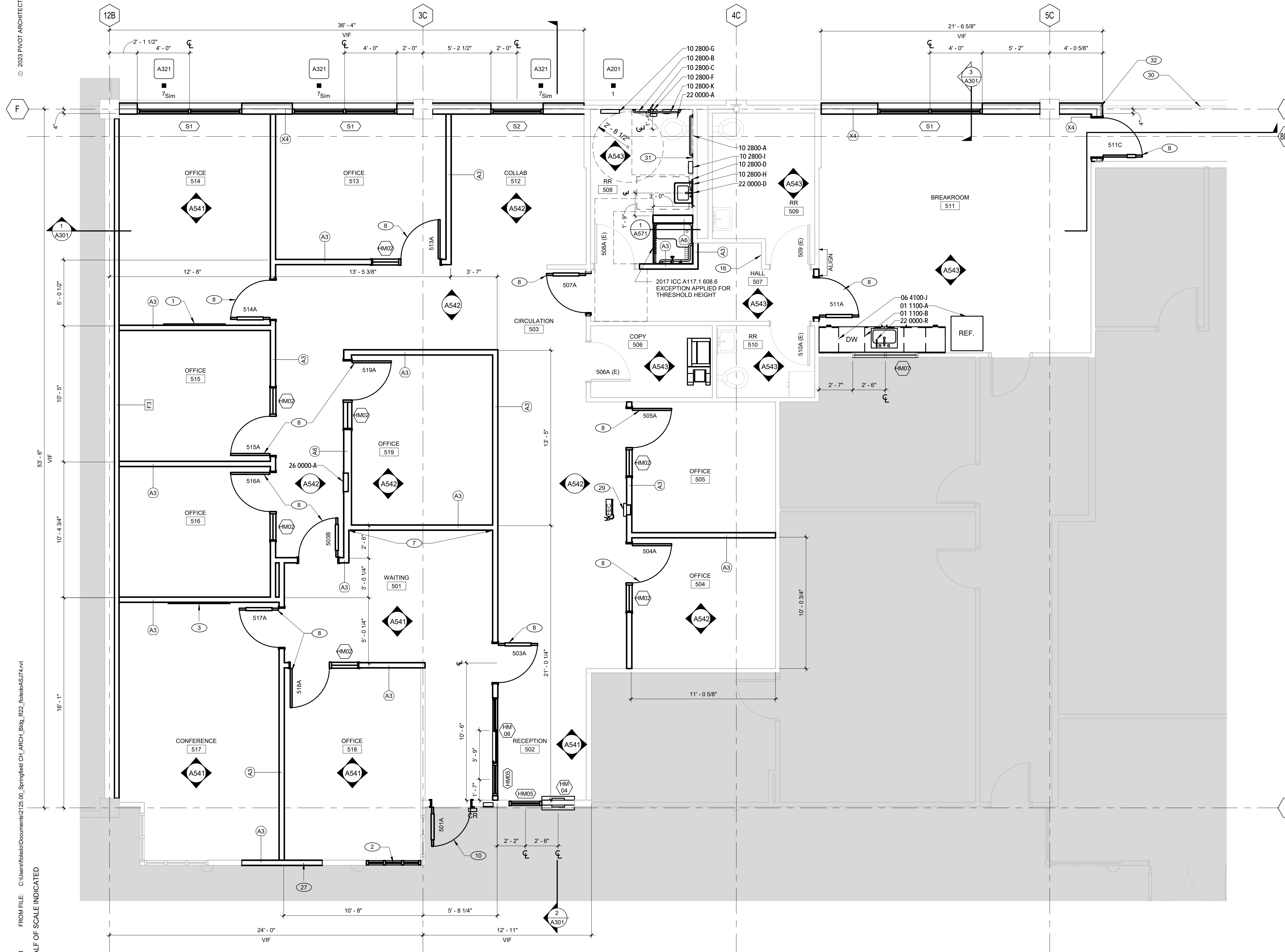
SHEET TITLE:
PHASING PLANS

REVISIONS:

#	DESCRP.	DATE

ISSUE DATE: 09.28.2023





GENERAL NOTES - FLOOR PLANS

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- B. REFER TO WALL ASSEMBLY INFORMATION FOR WALL CONSTRUCTION AND THICKNESS.
- C. ALL NEW WALLS, AND GYP. BD. CEILINGS IN WORK AREAS TO BE PAINTED.
- D. REPAIR PATCHED SURFACES THAT ARE DAMAGED, LIFTED, DISCOLORED, OR SHOWING OTHER IMPERFECTIONS DUE TO PATCHING WORK IF DEFECTS ARE DUE TO CONDITION OF SUBSTRATE. REPAIR SUBSTRATE PRIOR TO REPAIRING FINISH.
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- K. BOOKCASES AND SHELVES TO BE OFICI. COORDINATE WITH OWNER PRIOR ON MOVING AND SEQUENCING.
- L. SEE A540 FOR DIMENSIONS OF RESTROOM ACCESSORIES.
- M. SEE SHEET A802 - FURNITURE PLAN FOR BOOKSHELF LOCATION DIMENSIONS

KEYNOTES - SPECIFICATION

01 1100-A	REFRIGERATOR, OFCI
01 1100-B	DISHWASHER, OFCI
06 4100-J	CASEWORK, SEE INTERIOR ELEVATIONS
10 2800-A	GRAB BAR (GB-1)
10 2800-B	GRAB BAR (GB-2)
10 2800-C	GRAB BAR (GB-3)
10 2800-D	FRAMED MIRROR - 24" X 36"
10 2800-F	TOILET PAPER DISPENSER
10 2800-G	SEAT COVER DISPENSER
10 2800-H	SOAP DISPENSER
10 2800-I	PAPER TOWEL DISPENSER
10 2800-K	SANITARY NAPKIN DISPOSAL
22 0000-A	WALL MOUNTED TOILET, SEE PLUMBING
22 0000-D	SINK, SEE PLUMBING
22 0000-R	COUNTERTOP WATER FILTRATION SYSTEM, SEE PLUMBING
26 0000-A	ELECTRICAL PANEL, SEE ELECTRICAL

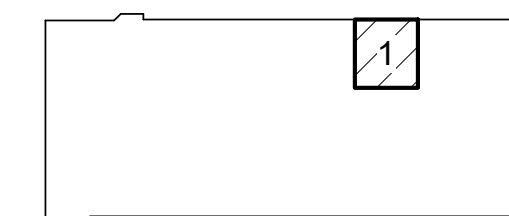
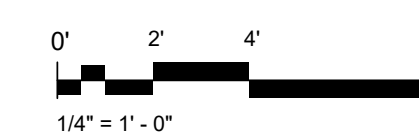
KEYNOTES

- 1 PROVIDE WALL BACKING FOR FUTURE OFOI DISPLAY
- 2 REPLACE (E) WINDOW WITH SALVAGED WINDOW FROM LIBRARY. SEE DEMO PLANS
- 3 RELOCATE (E) AV EQUIPMENT FROM OLD CM OFFICE. PROVIDE WALL BACKING FOR DISPLAY
- 7 PROVIDE WALL BACKING FOR FUTURE WALL MOUNTED SIGN, COORDINATE WITH OWNER
- 8 INSTALL NEW DOOR FRAME AND DOOR PANEL
- 10 INSTALL SALVAGED DOOR PANEL IN NEW DOOR FRAME
- 16 PROVIDE BLOCKING FOR OFOI WALL MOUNTED BIKE RACKS
- 27 RELOCATE OFCI FRAMED "SIMPSONS" ARTWORK IN HALLWAY
- 29 INSTALL SALVAGED FIRE EXTINGUISHER CABINET
- 30 (E) RAILING TO REMAIN
- 31 REPAIR WALL
- 32 PROVIDE NEW RAILING ATTACHMENT TO BUILDING SIMILAR TO EXISTING

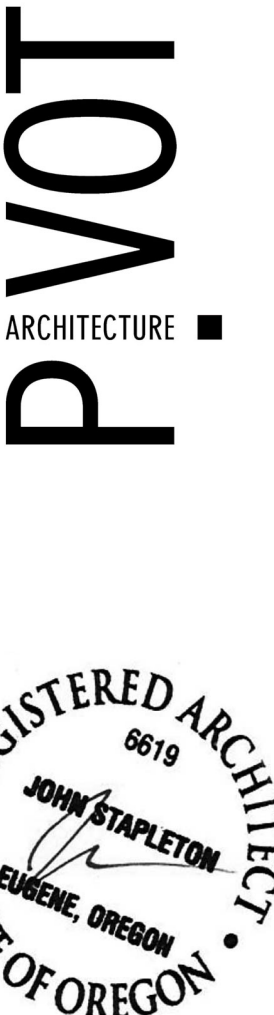
FLOOR PLAN LEGEND

- AREA NOT IN SCOPE OF WORK
- EXISTING WALL ASSEMBLY
- NEW WALL ASSEMBLY
- NEW BOOKSHELVES, OFCI
- EXISTING AND RELOCATED LIBRARY BOOKSHELVES, OFCI
- EXISTING BOOKSHELVES TO REMAIN

1 FLOOR PLAN - CM OFFICE
1/4" = 1'-0"



KEYPLAN



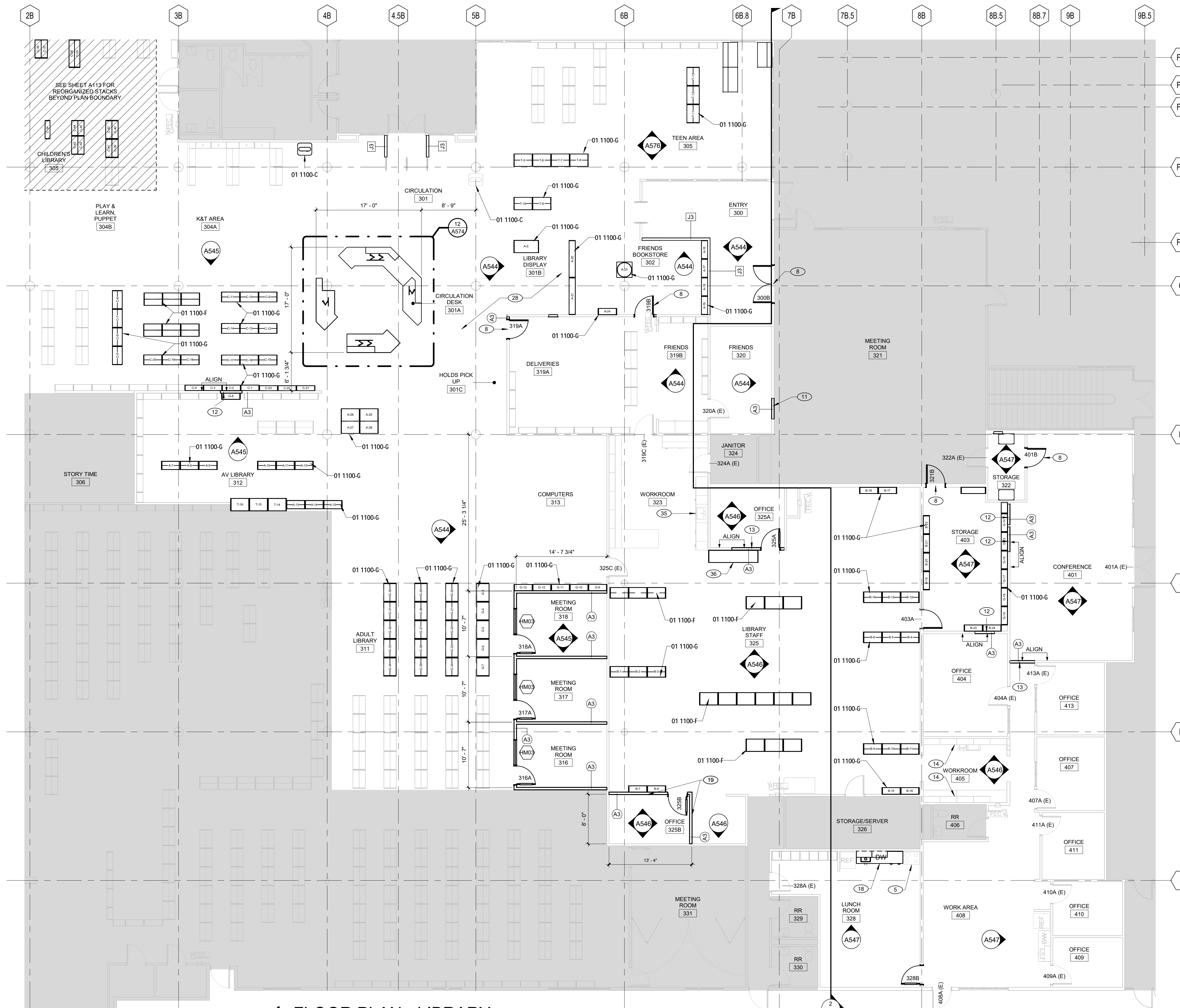
CONSTRUCTION DRAWINGS
SPRINGFIELD CITY HALL RENOVATION
PROJECT #: 2125.00
CITY OF SPRINGFIELD
225 5TH STREET SPRINGFIELD, OR 97477

SHEET TITLE:
FLOOR PLAN - CM OFFICE

REVISIONS:
DESCRP. DATE

ISSUE DATE: 09.28.2023

A111



GENERAL NOTES - FLOOR PLANS

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- M. SEE SHEET A802 - FURNITURE PLAN FOR BOOKSHELF LOCATION DIMENSIONS

KEYNOTES - SPECIFICATION

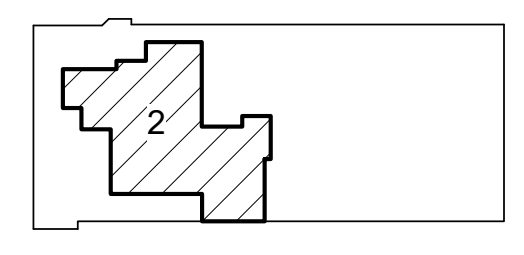
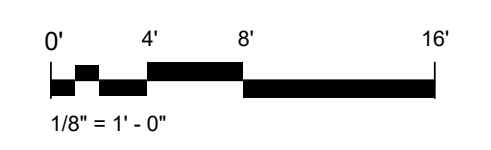
- 01 1100-C SELF CHECKOUT KIOSK, OFOI
- 01 1100-F NEW BOOKSHELVES, OFCI
- 01 1100-G EXISTING AND RELOCATED BOOKSHELVES, OFCI

KEYNOTES

- 5 (E) RESIDENTIAL RANGE AND MICROWAVE EXHAUST ABOVE TO REMAIN
- 8 INSTALL NEW DOOR FRAME AND DOOR PANEL
- 11 INFILL WALL WHERE PREVIOUS DOOR WAS LOCATED
- 12 INFILL WALL OPENINGS. PATCH AND REPAIR TO MATCH ADJACENT WALLS
- 13 INFILL WITH NEW WALL TO BOTTOM OF EXISTING CEILING
- 14 EXISTING CASEWORK TO REMAIN
- 18 ADD ALT L-2 - PROVIDE NEW CASEWORK, DISHWASHER AND SINK IN LUNCH ROOM
- 19 ADD ALT L-3 - INSTALL NEW WALLS FOR IT OFFICE
- 28 INSTALL EXISTING CARPET IN AREAS WHERE OLD CIRCULATION DESKS WERE
- 35 EXISTING CASEWORK AND SINK TO REMAIN
- 36 RELOCATED (E) TABLE

FLOOR PLAN LEGEND

- AREA NOT IN SCOPE OF WORK
- EXISTING WALL ASSEMBLY
- NEW WALL ASSEMBLY
- NEW BOOKSHELVES, OFCI
- EXISTING AND RELOCATED LIBRARY BOOKSHELVES, OFCI
- EXISTING BOOKSHELVES TO REMAIN



1 FLOOR PLAN - LIBRARY
1/8" = 1'-0"



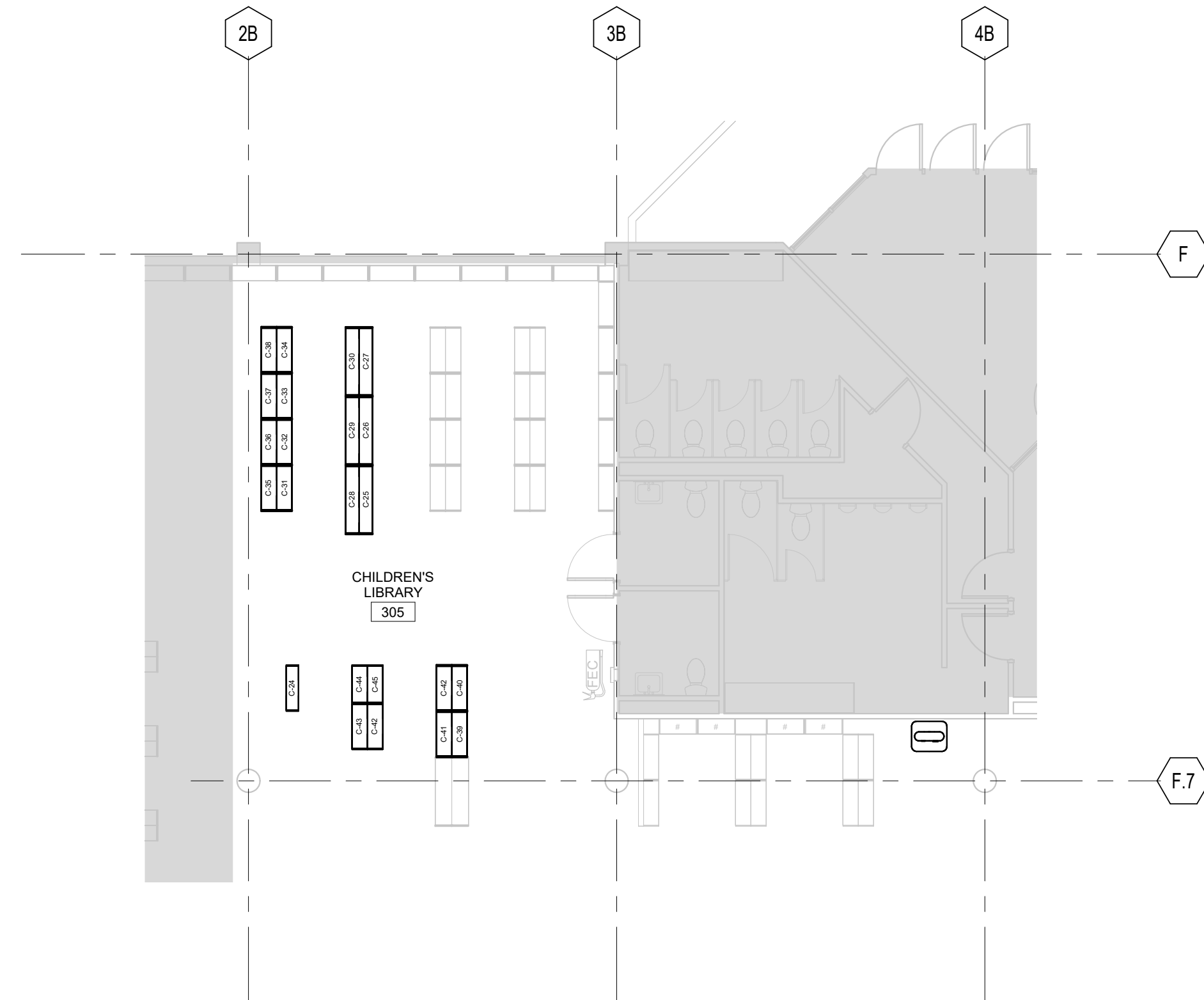
CONSTRUCTION DRAWINGS
SPRINGFIELD CITY HALL RENOVATION
 PROJECT #: 2125.00
 CITY OF SPRINGFIELD
 225 5TH STREET SPRINGFIELD, OR 97477

SHEET TITLE:
FLOOR PLAN - LIBRARY

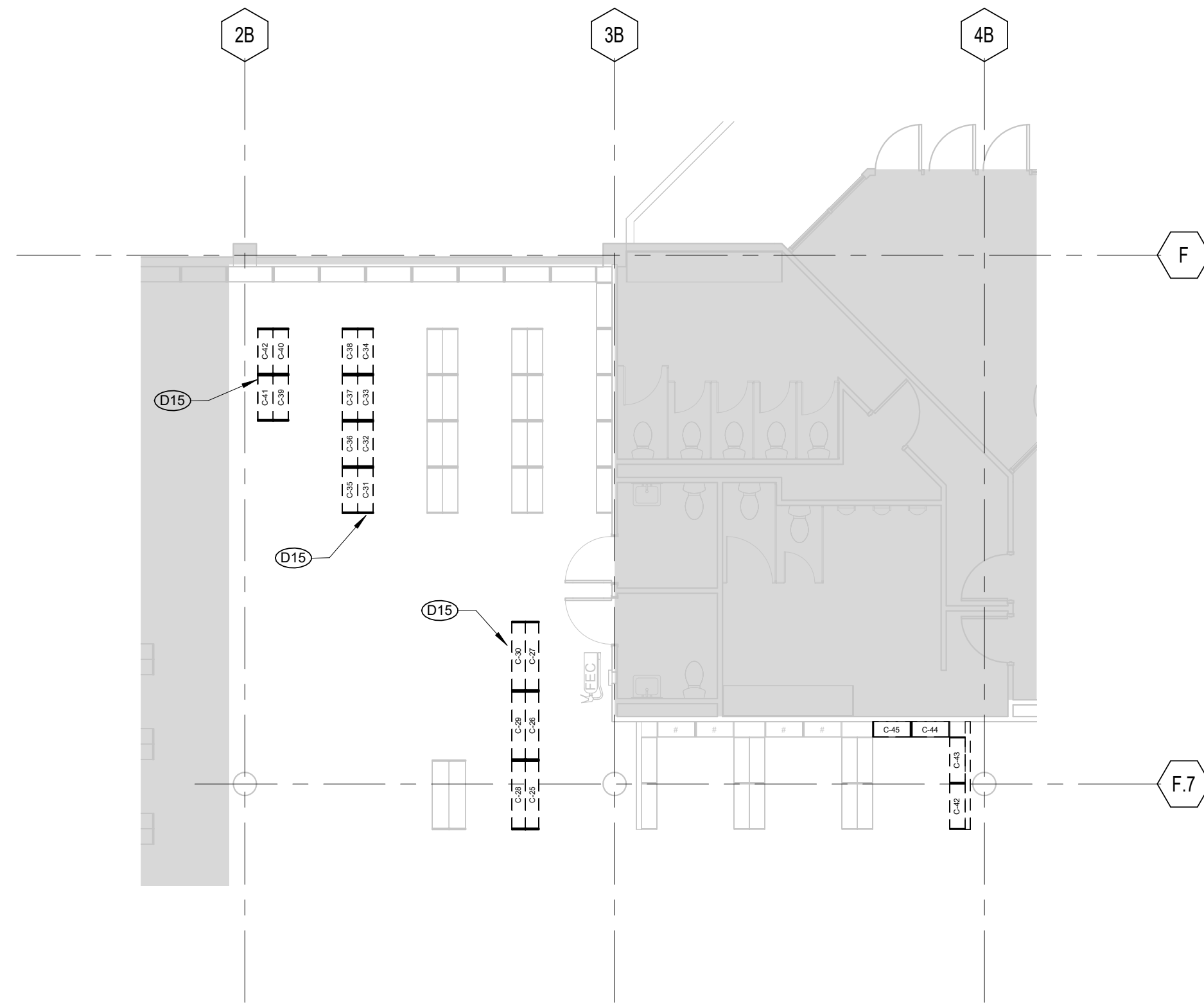
REVISIONS:
 # DESCRP. DATE

ISSUE DATE: 09.28.2023

A112



2 FLOOR PLAN - LIBRARY
1/8" = 1'-0"



1 DEMOLITION PLAN - LIBRARY
1/8" = 1'-0"

GENERAL NOTES - FLOOR PLANS

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- M. SEE SHEET A802 - FURNITURE PLAN FOR BOOKSHELF LOCATION DIMENSIONS

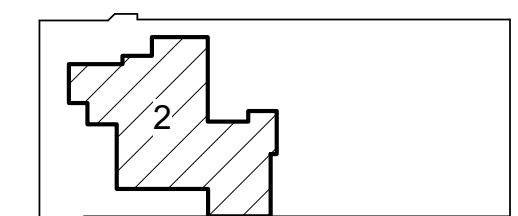
KEYNOTES - SPECIFICATION

KEYNOTES

- D15 RELOCATE (E) BOOKSHELVES, SEE FLOOR PLAN FOR NEW LOCATION

FLOOR PLAN LEGEND

- AREA NOT IN SCOPE OF WORK
- EXISTING WALL ASSEMBLY
- NEW WALL ASSEMBLY
- NEW BOOKSHELVES, OFCI
- EXISTING AND RELOCATED LIBRARY BOOKSHELVES, OFCI
- EXISTING BOOKSHELVES TO REMAIN



KEYPLAN

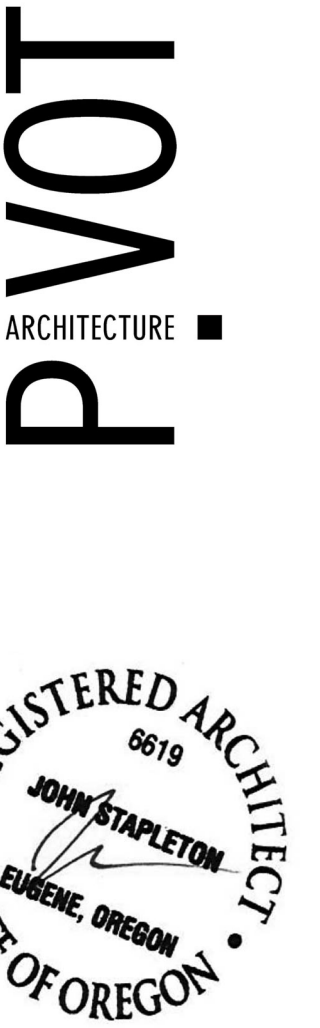
CONSTRUCTION DRAWINGS
SPRINGFIELD CITY HALL RENOVATION
 PROJECT #: 2125.00
 CITY OF SPRINGFIELD
 225 5TH STREET SPRINGFIELD, OR 97477

SHEET TITLE:
FLOOR PLAN - CHILDREN'S LIBRARY

REVISIONS:
 # DESCRP. DATE

ISSUE DATE: 09.28.2023

A113





GENERAL NOTES - REFLECTED CEILING...

- A. SEE MECHANICAL ELECTRICAL AND PLUMBING DRAWINGS FOR ADDITIONAL CEILING INFORMATION
- B. ALL CEILING HEIGHTS SHOWN ARE FROM FINISHED FLOOR UNLESS NOTED OTHERWISE
- C. ALL DIMENSIONS FROM FACE OF STUD OR MASONRY WALL UNLESS NOTED OTHERWISE
- D. LIGHT FIXTURES SHOWN ARE RECOMMENDED LOCATION, SEE ELECTRICAL FOR ALL FIXTURES AND LOCATIONS.

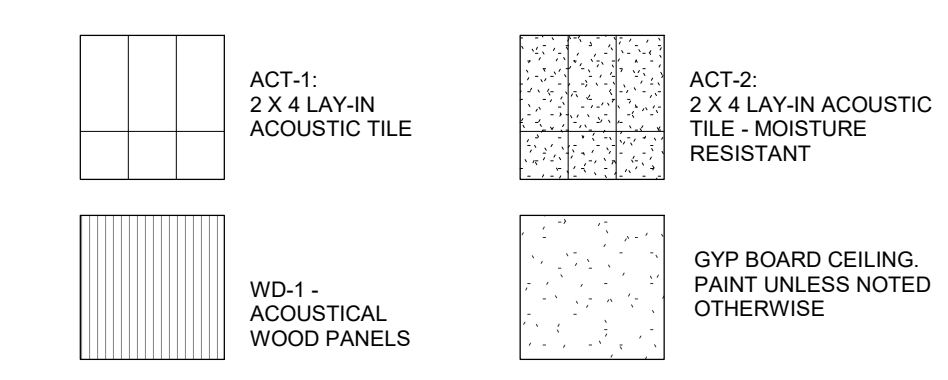
KEYNOTES

- 33 INSTALL NEW ACOUSTIC TILE AT THE SAME HEIGHT AS THE EXISTING CEILING TILE

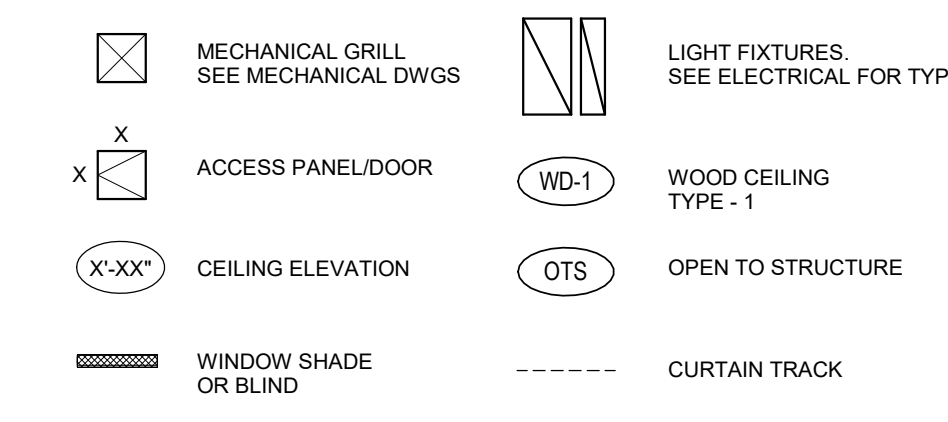
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- 33 INSTALL NEW ACOUSTIC TILE AT THE SAME HEIGHT AS THE EXISTING CEILING TILE

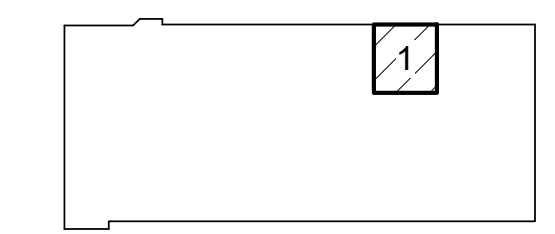
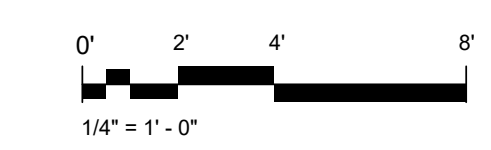
CEILING MATERIAL LEGEND



CEILING SYMBOLS



1 REFLECTED CEILING PLAN - CM OFFICE
1/4" = 1'-0"

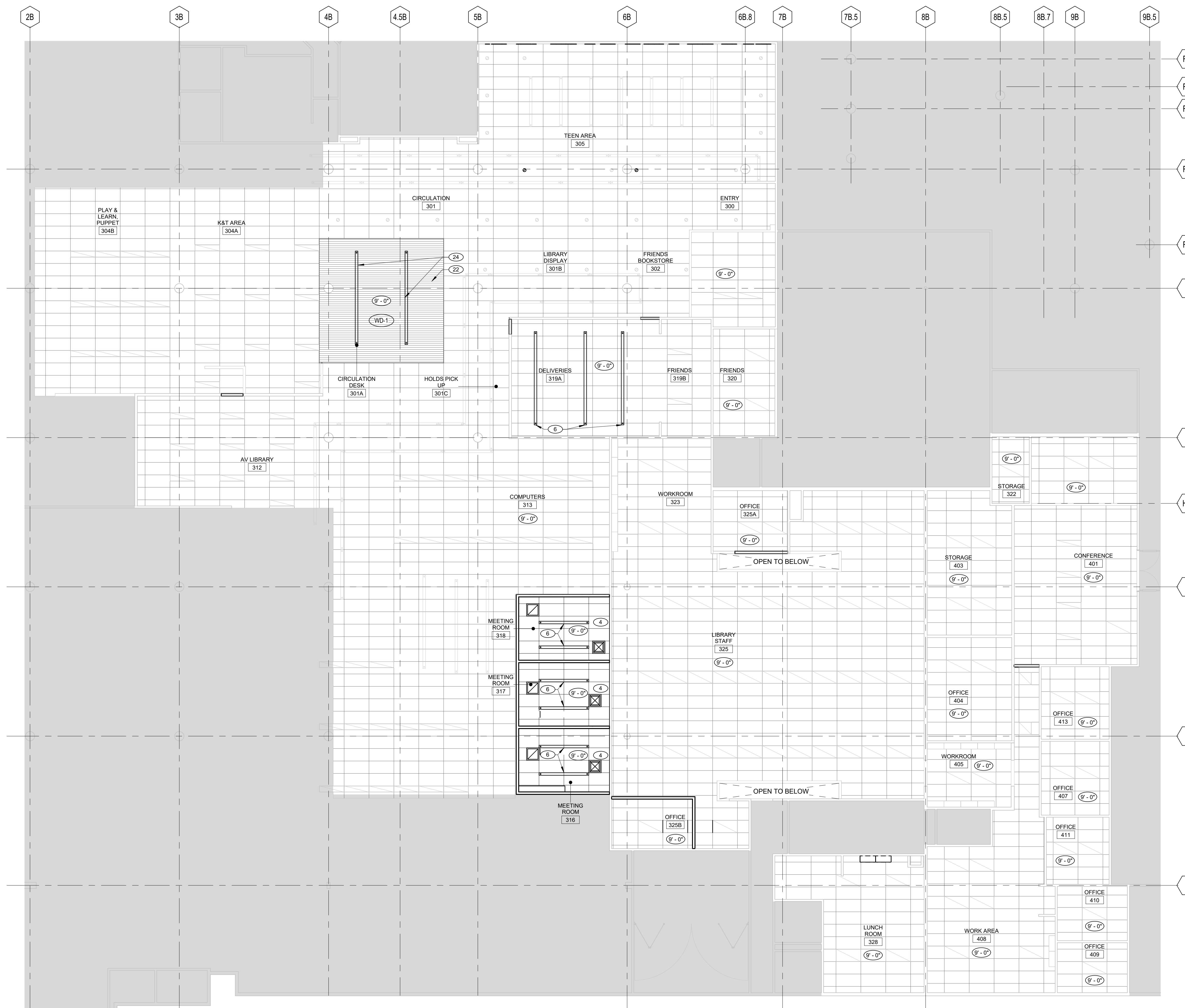


KEYPLAN



REVISIONS:

#	DESCRP.	DATE



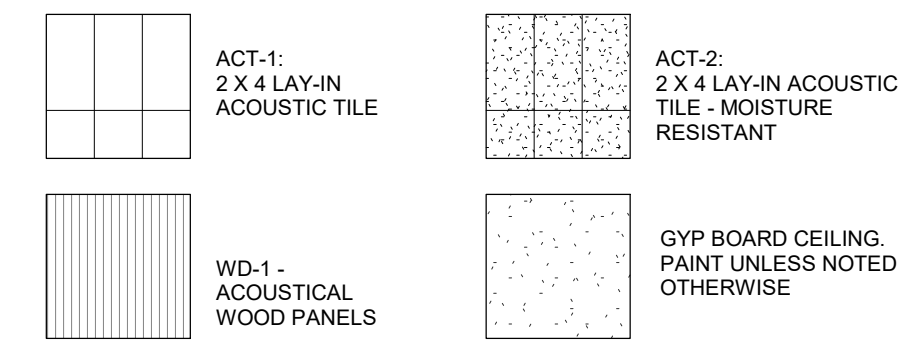
GENERAL NOTES - REFLECTED CEILING...

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- C. ALL DIMENSIONS FROM FACE OF STUD OR MASONRY WALL UNLESS NOTED OTHERWISE
- D. LIGHT FIXTURES SHOWN ARE RECOMMENDED LOCATION, SEE ELECTRICAL FOR ALL FIXTURES AND LOCATIONS.

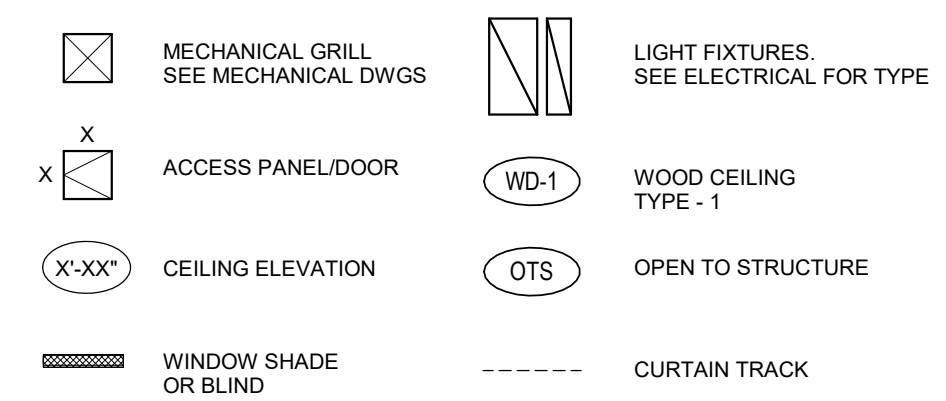
KEYNOTES

- 4. INSTALL NEW ACT CEILING TILE AND GRID IN NEW MEETING ROOMS
- 6. INSTALL NEW LIGHT FIXTURES, SEE ELECTRICAL
- 22. ADD ALT L-2 - INSTALL WD-1 ACOUSTICAL WOOD PANELS IN (E) CEILING GRID
- 24. ADD ALT L-2 - INSTALL NEW PENDANT FIXTURES, SEE ELECTRICAL

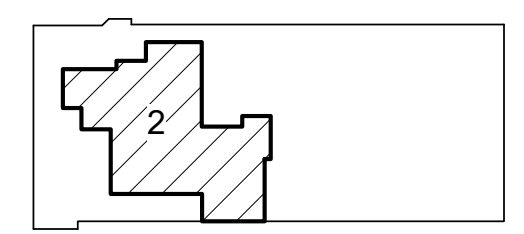
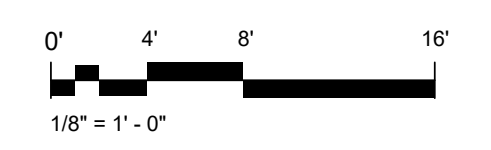
CEILING MATERIAL LEGEND



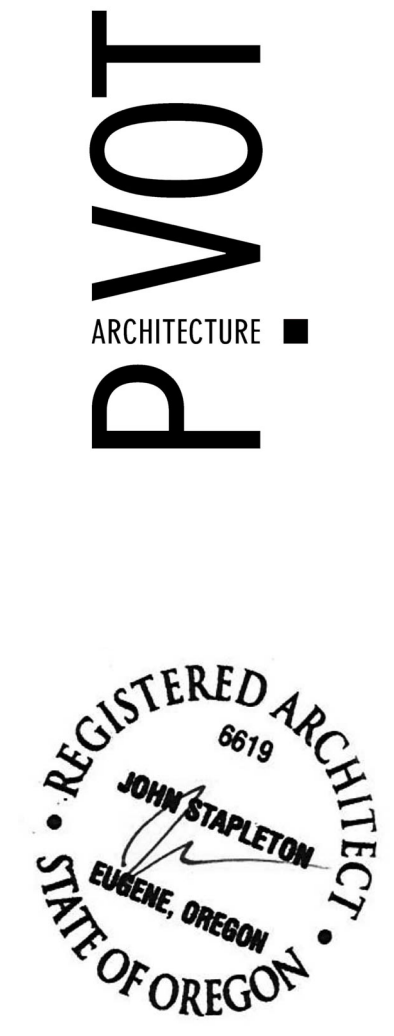
CEILING SYMBOLS



1 REFLECTED CEILING PLAN - LIBRARY
1/8" = 1'-0"



KEYPLAN



CONSTRUCTION DRAWINGS
SPRINGFIELD CITY HALL RENOVATION
PROJECT #: 2125.00
CITY OF SPRINGFIELD
225 5TH STREET SPRINGFIELD, OR 97477

SHEET TITLE:
REFLECTED
CEILING PLAN
- LIBRARY

REVISIONS:
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ISSUE DATE: 09.28.2023

GENERAL NOTES - EXTERIOR ELEV.

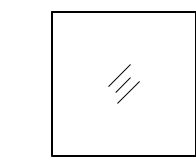
A. ALL EXTERIOR WINDOWS TO BE ALUMINUM UNLESS NOTED OTHERWISE.

KEYNOTES

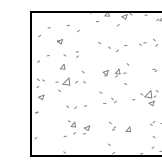
34 PROVIDE NEW STEEL PLATE WELDED TO END OF RAILING, FOR ATTACHMENT TO WALL

ABBV.	DESCRIPTION
MP-1	METAL WALL PANEL - TYPE 1
	MANUFACTURER: TYPE: COLOR:

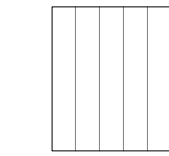
EXTERIOR MATERIAL LEGEND



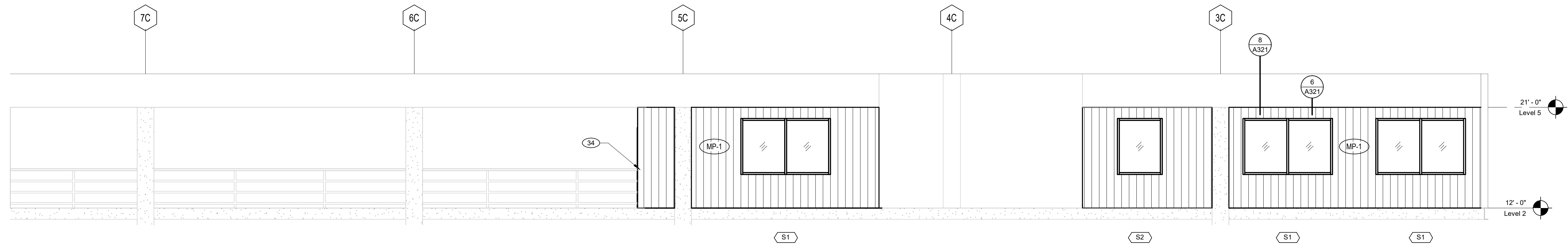
GLAZING



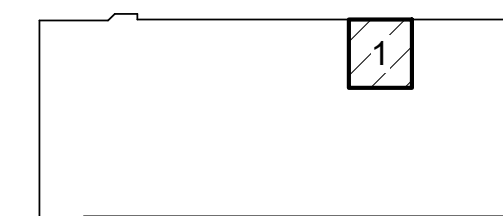
PRECAST CONCRETE



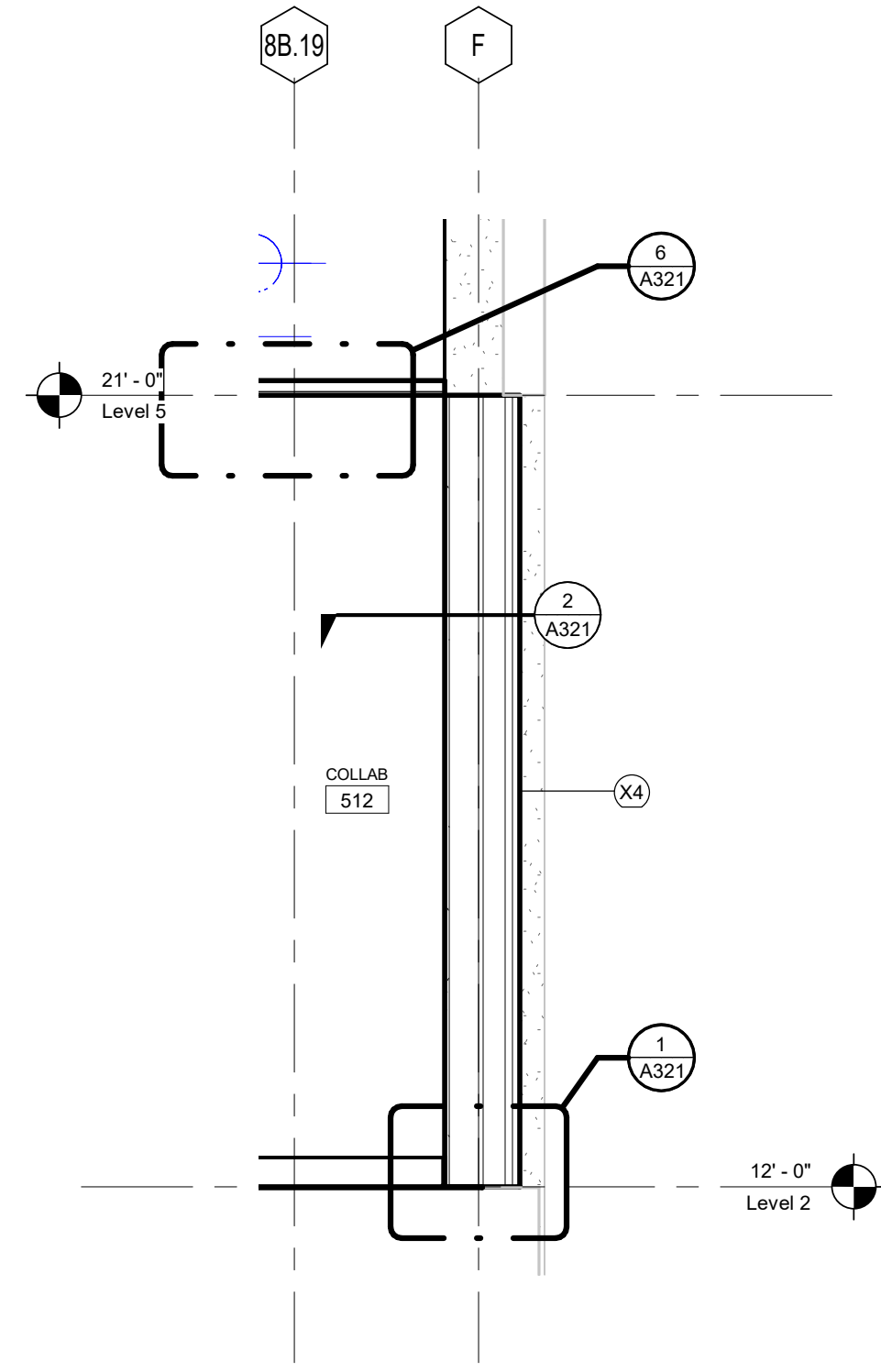
METAL WALL PANEL



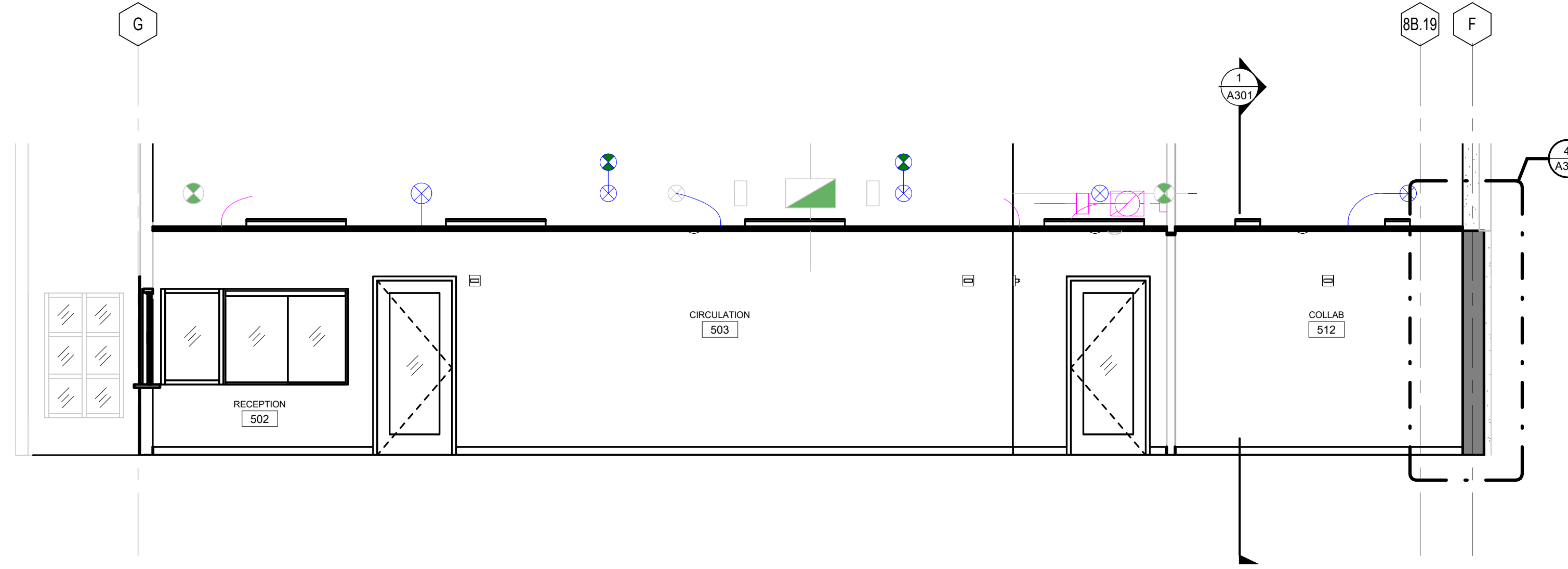
1 ENLARGED ELEVATION - CM OFFICE NORTH
3/16" = 1'-0"



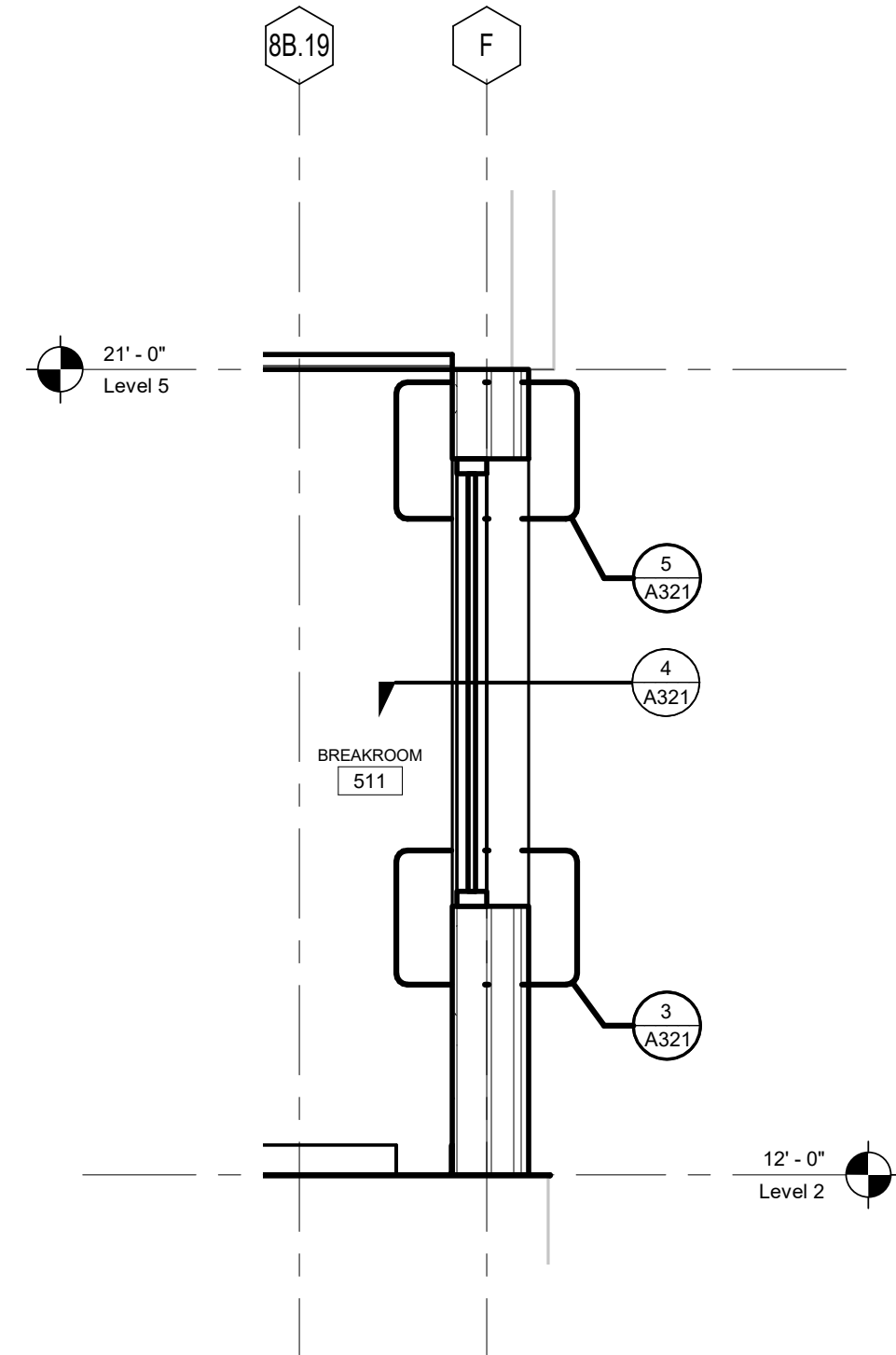
KEYPLAN



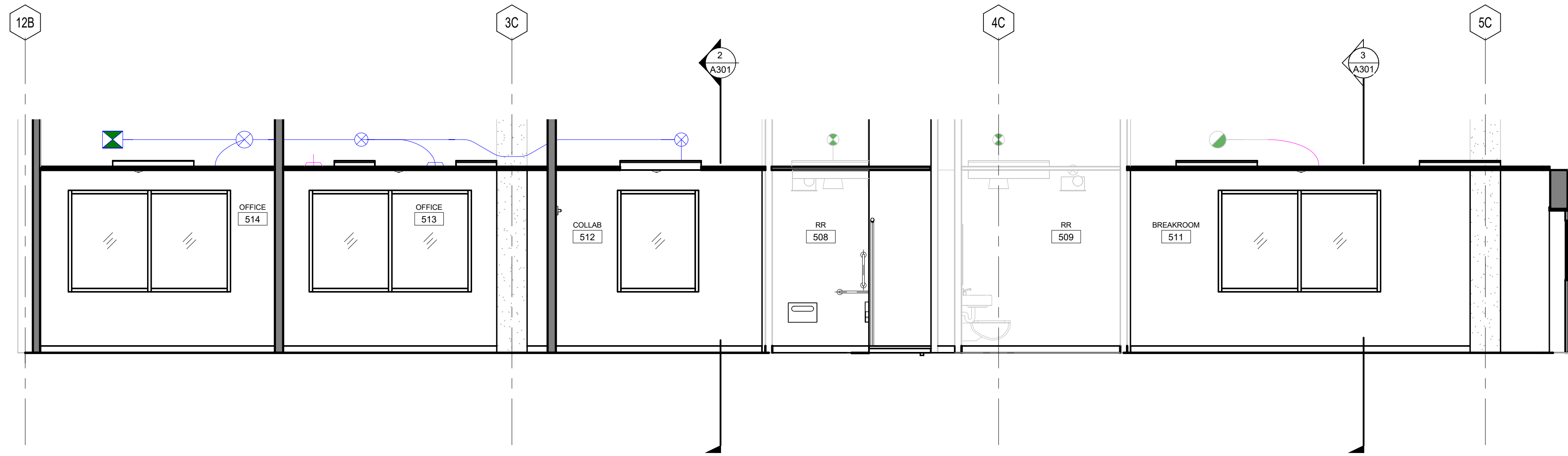
4 WALL SECTION - COLLAB N
1/2" = 1'-0"



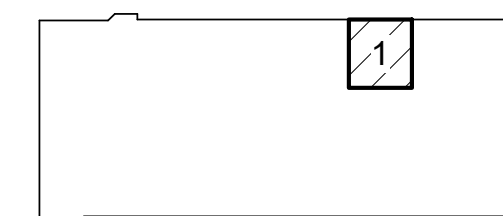
2 BUILDING SECTION - NS
1/4" = 1'-0"



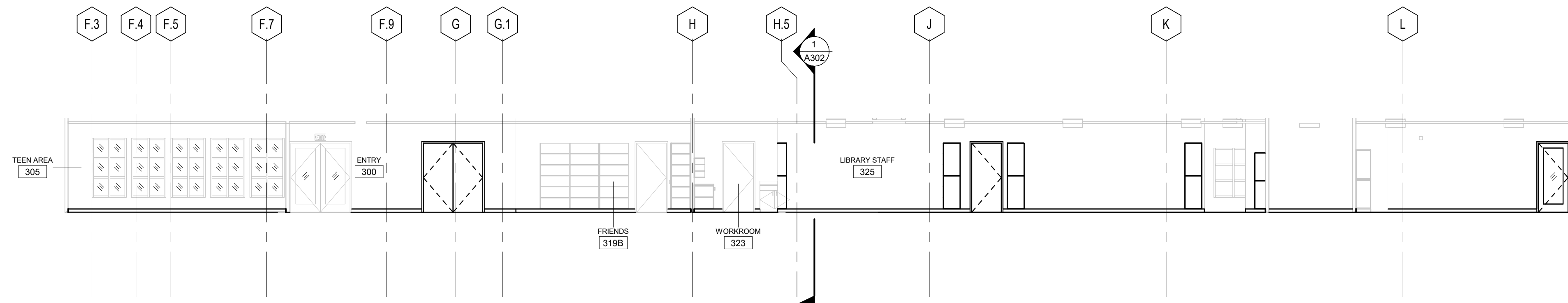
3 WALL SECTION - BREAK ROOM N
1/2" = 1'-0"



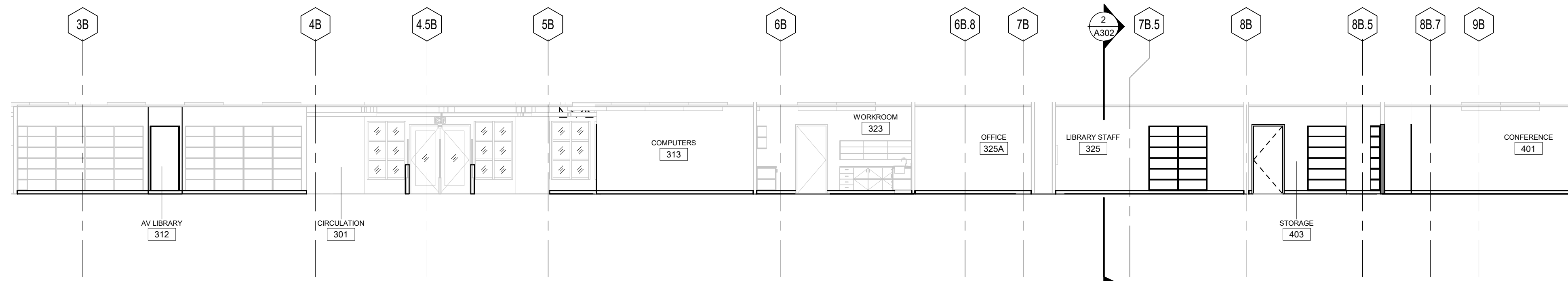
1 BUILDING SECTION - EW
1/4" = 1'-0"



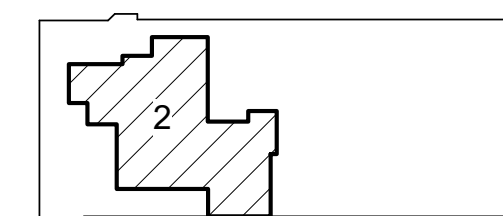
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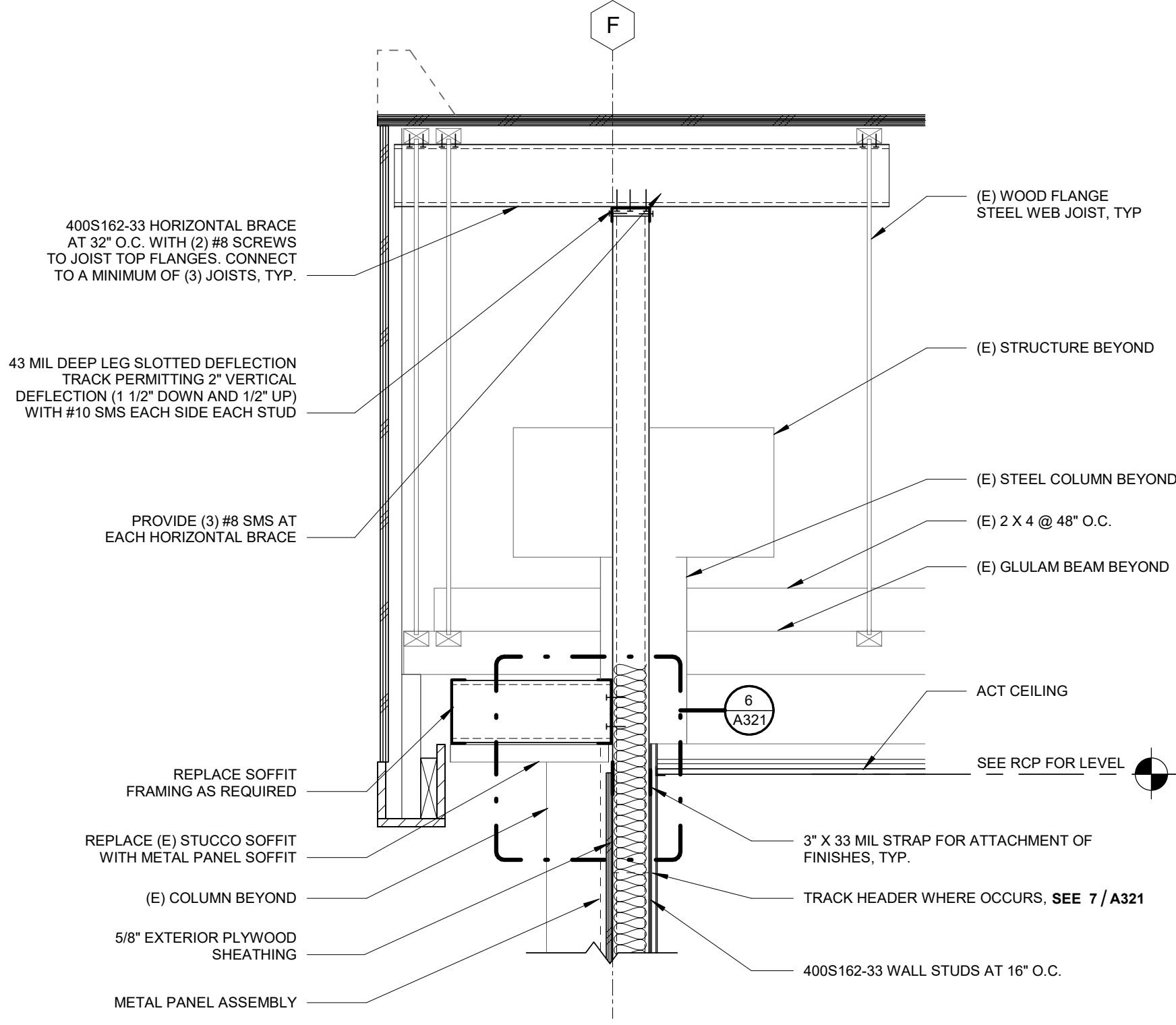
2 SECTION - LIBRARY NS
1/8" = 1'-0"



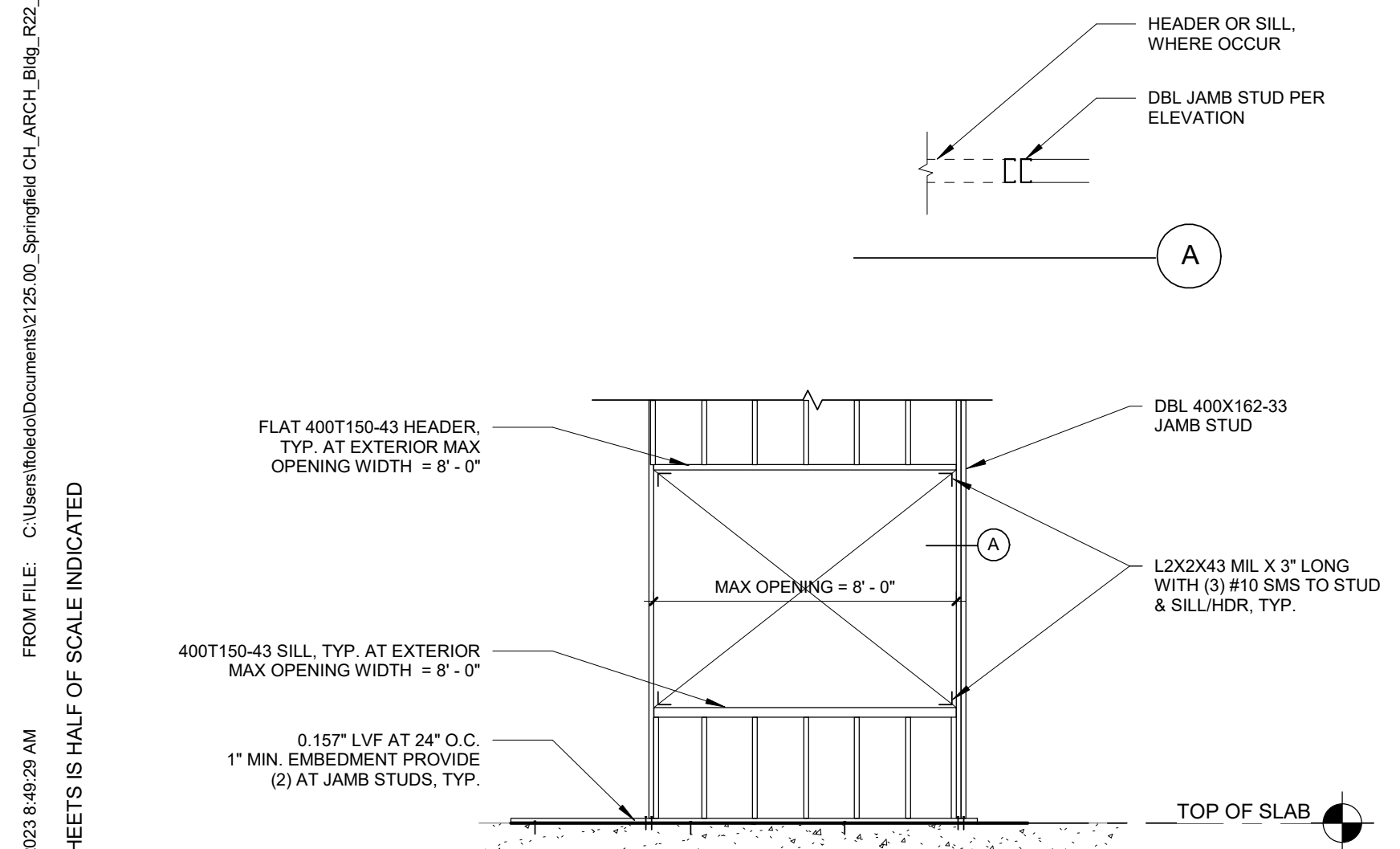
1 SECTION - LIBRARY EW
1/8" = 1'-0"



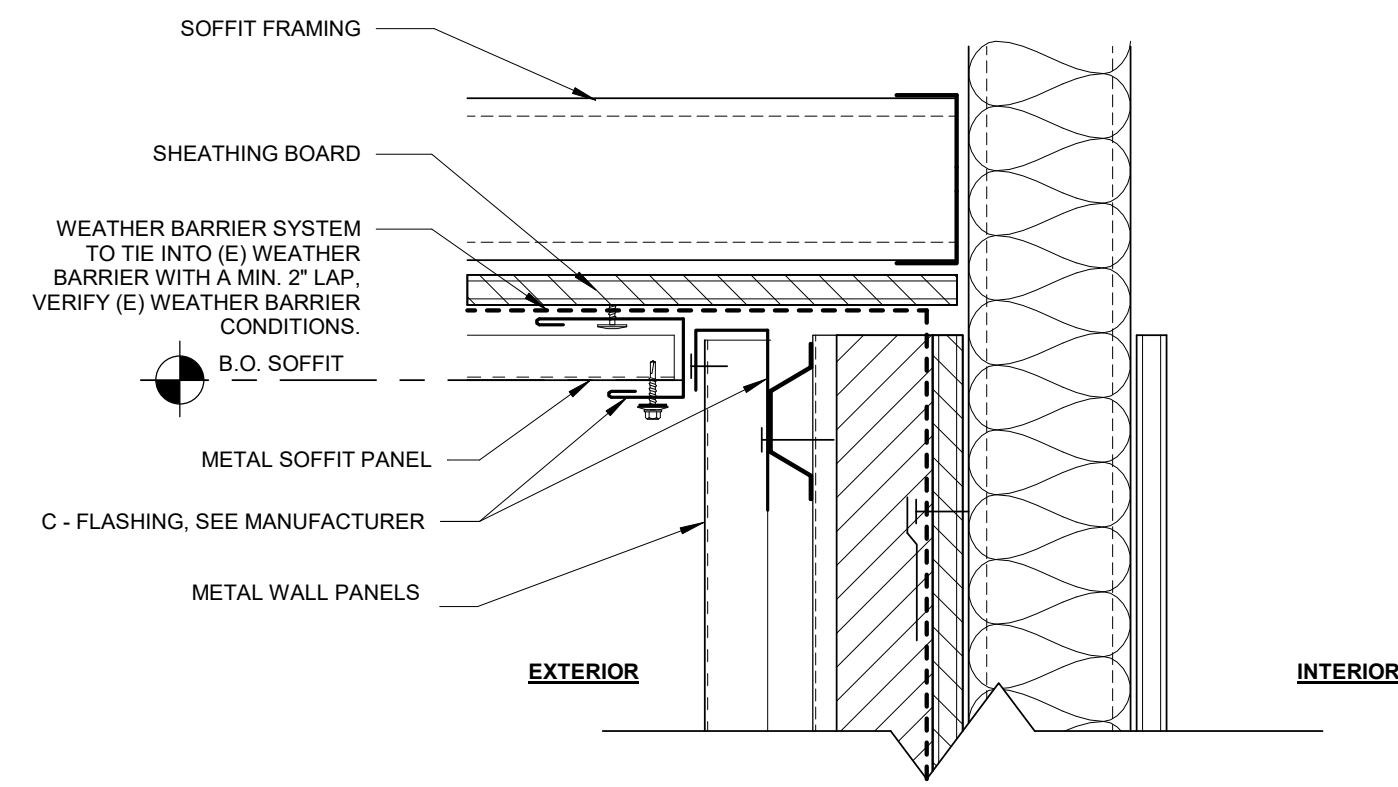
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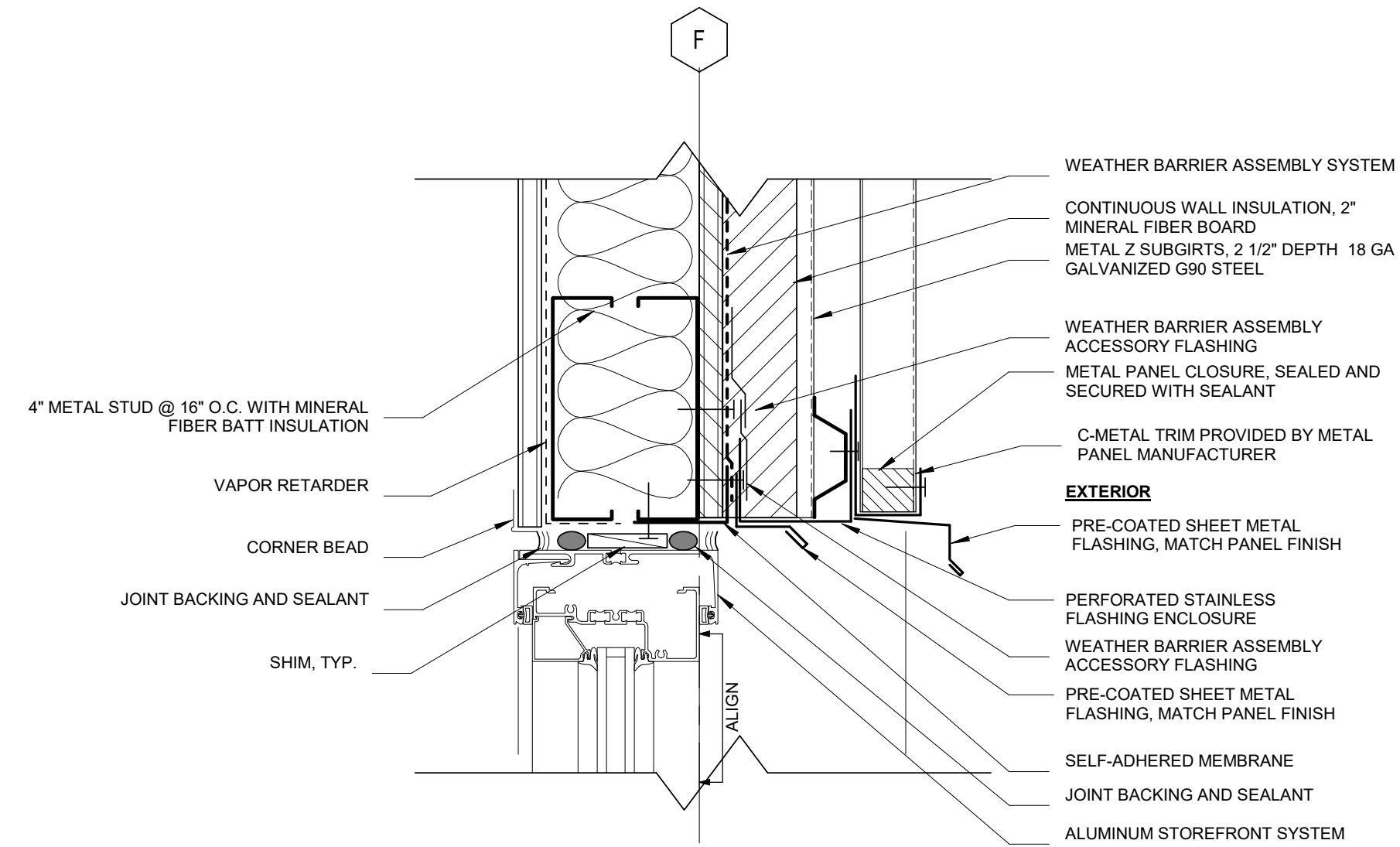
8 NEW EXTERIOR WALL
1" = 1'-0"



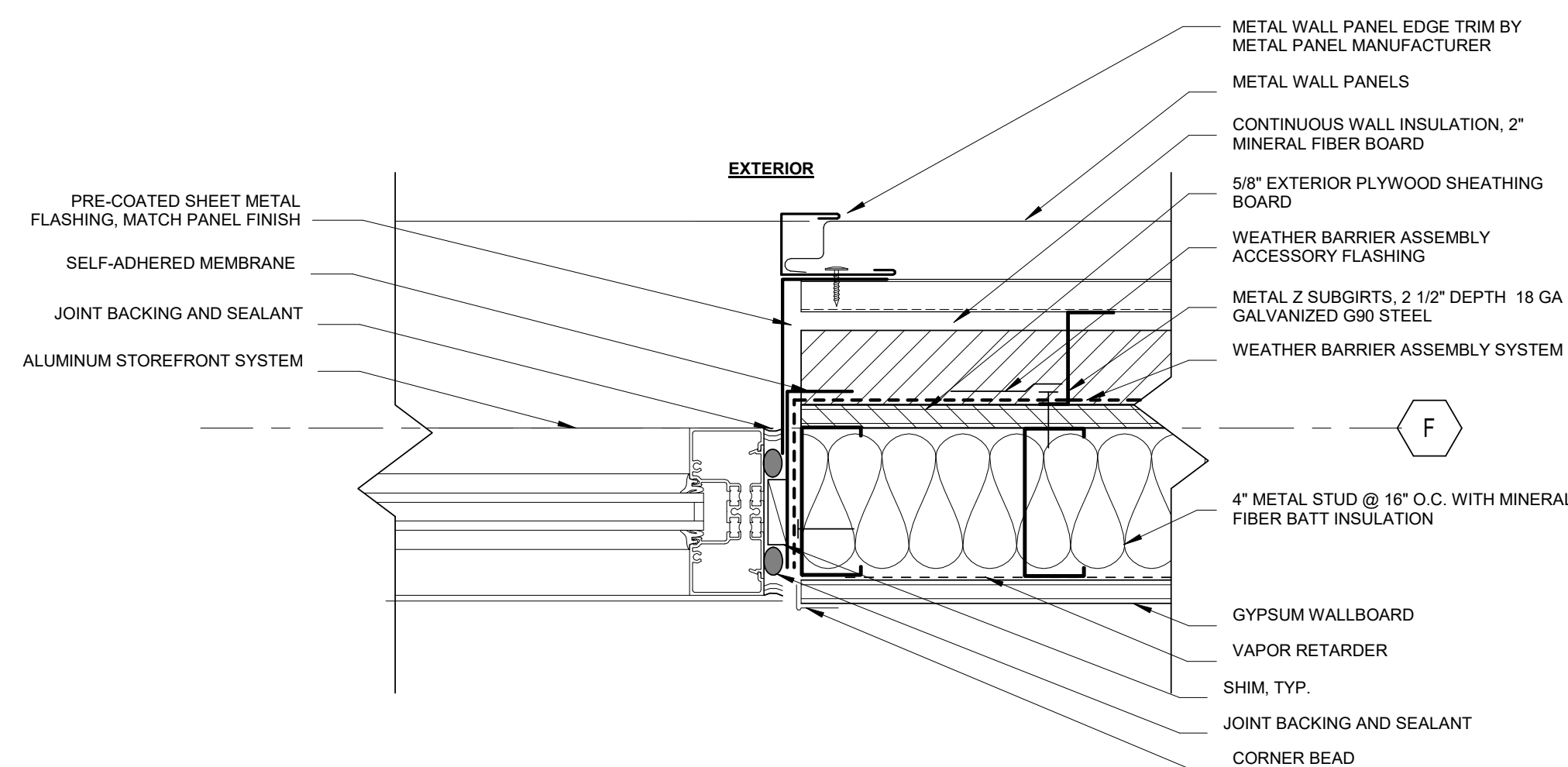
7 OPENING IN EXTERIOR STUD WALL
1/4" = 1'-0"



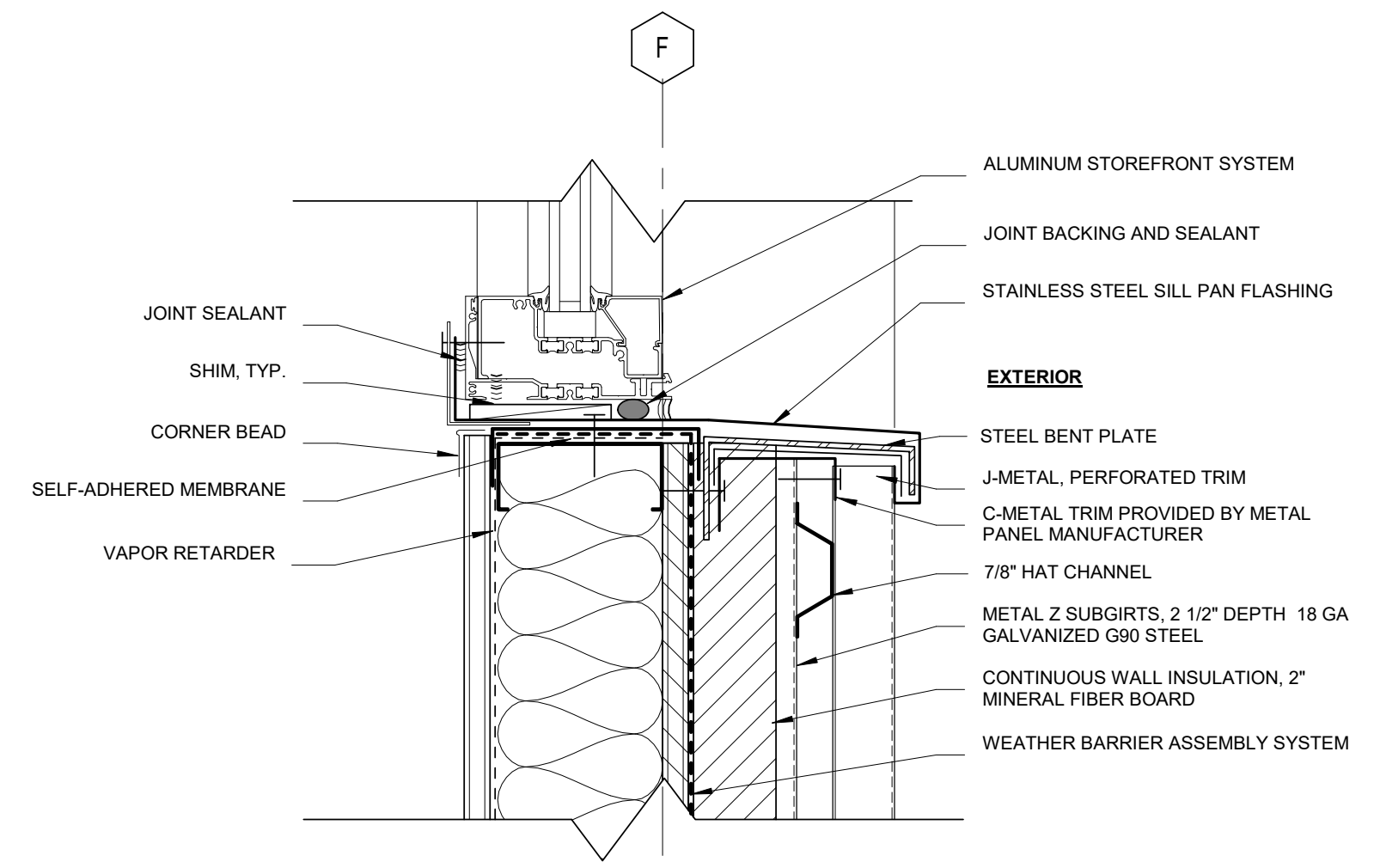
6 N EXTERIOR WALL TYP - SOFFIT
3" = 1'-0"



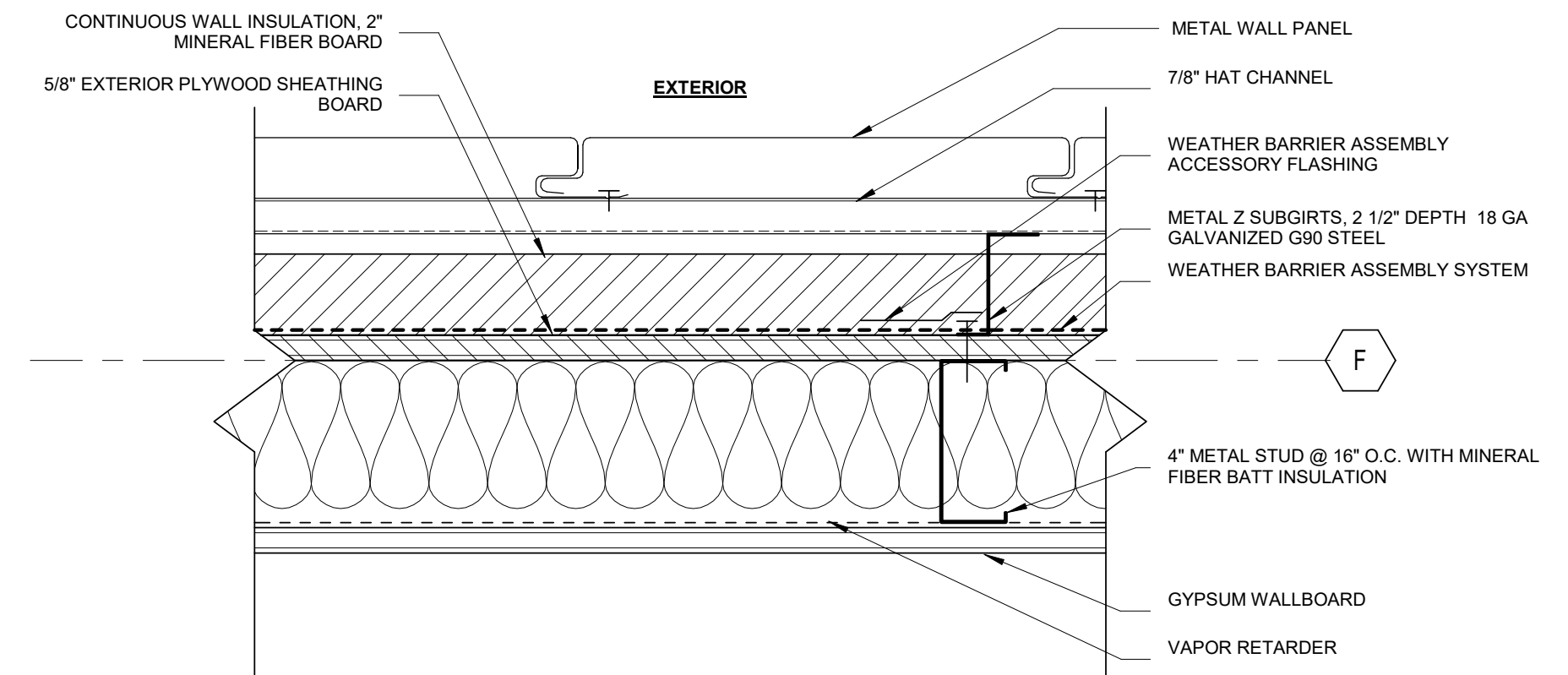
5 N EXTERIOR WALL AT SF- HEAD
3" = 1'-0"



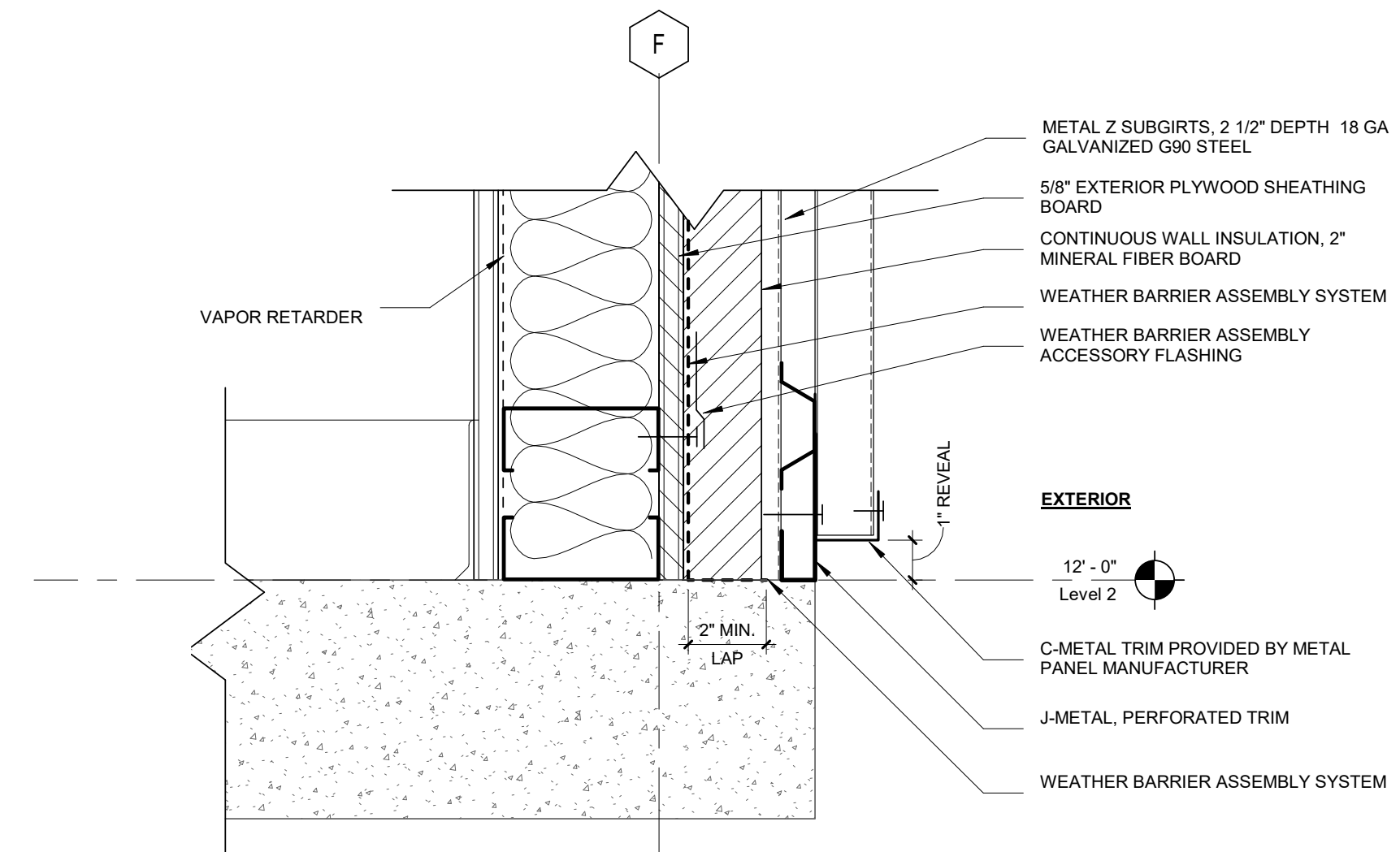
4 N EXTERIOR WALL AT SF- JAMB
3" = 1'-0"



3 N EXTERIOR WALL AT SF - SILL
3" = 1'-0"



2 N EXTERIOR WALL TYP - PLAN
3" = 1'-0"



1 N EXTERIOR WALL TYP - BASE
3" = 1'-0"

ROOM FINISH AND MATERIALS LEGEND					
ABBV.	DESCRIPTION	ABBV.	DESCRIPTION	ABBV.	DESCRIPTION
ACT-1	ACOUSTICAL CEILING TYPE - 1 SPECIFICATION: 09 5100 ACOUSTICAL CEILINGS MANUFACTURER: MILLIKEN COLOR: WHITE SIZE: 24 X 48 INCHES	CPT-6	CARPET TILE TYPE - 6 SPECIFICATION: 09 6813 TILE CARPETING MANUFACTURER: MILLIKEN COLLECTION: LAYLINES STYLE: COLOR LINE COLOR: CLAY LLN118 SIZE: 19.7 X 19.7 INCHES	PT-3	PAINT TYPE - 3 SPECIFICATION: 09 9000 PAINTING AND COATING MANUFACTURER: SHERWIN-WILLIAMS COLOR: SW 6487 CLOUDBURST
ACT-2	ACOUSTICAL CEILING TYPE - 2 SPECIFICATION: 09 8400 ACOUSTICAL CEILING MANUFACTURER: AQUAROCK COLOR: WHITE SIZE: 24 X 48 INCHES	CPT-7	CARPET TILE TYPE - 7 SPECIFICATION: 09 6813 TILE CARPETING MANUFACTURER: MILLIKEN COLLECTION: LAYLINES STYLE: COLOR LINE WITH TRANSITIONS COLOR: MARINE/CLAY LTH201-118 SIZE: 19.7 X 19.7 INCHES	PT-4	PAINT TYPE - 4 SPECIFICATION: 09 9000 PAINTING AND COATING MANUFACTURER: SHERWIN-WILLIAMS COLOR: SW 6509 GEORGIAN BAY
AWP-1	ACOUSTICAL WALL PANEL - 1 SPECIFICATION: 09 8400 ACOUSTICAL TREATMENT MANUFACTURER: FSORB COLOR: LIGHT GREY FS-130	CPT-8	CARPET TILE TYPE - 8 SPECIFICATION: 09 6813 TILE CARPETING MANUFACTURER: MILLIKEN COLLECTION: LAYLINES STYLE: COLOR LINE COLOR: MARINE LLN201 SIZE: 19.7 X 19.7 INCHES	PT-5	PAINT TYPE - 5 SPECIFICATION: 09 9000 PAINTING AND COATING MANUFACTURER: SHERWIN-WILLIAMS COLOR: SW 7056 RESERVED WHITE
AWP-2	ACOUSTICAL WALL PANEL - 2 SPECIFICATION: 09 8400 ACOUSTICAL TREATMENT MANUFACTURER: FSORB COLOR: GREY FS-160	FA-1	UPHOLSTRY FABRIC TYPE - 1 SPECIFICATION: 12 5200 FURNISHINGS AND UPHOLSTRY MANUFACTURER: MOMENTUM PRODUCT: SILICA BLEND COLOR: SHORE	PT-6	PAINT TYPE - 6 SPECIFICATION: 09 9000 PAINTING AND COATING MANUFACTURER: SHERWIN-WILLIAMS COLOR: SW 6472 COMPOSED
AWP-3	ACOUSTICAL WALL PANEL - 3 SPECIFICATION: 09 8400 ACOUSTICAL TREATMENT MANUFACTURER: FSORB COLOR: GREEN FS-540	FA-2	UPHOLSTRY FABRIC TYPE - 2 SPECIFICATION: 12 5200 FURNISHINGS AND UPHOLSTRY MANUFACTURER: MOMENTUM PRODUCT: ZIPPED COLOR: SPLASH	PT-7	PAINT TYPE - 7 SPECIFICATION: 09 9000 PAINTING AND COATING MANUFACTURER: SHERWIN-WILLIAMS COLOR: SW 6479 DRIZZLE
B-1	RUBBER BASE TYPE - 1 SPECIFICATION: 09 6500 RESILIENT FLOORING MANUFACTURER: JOHNSONITE COLOR: 63 BURNT UMBER B PRODUCT: TRADITIONAL WALL BASE HEIGHT: 4 INCHES	FA-3	UPHOLSTRY FABRIC TYPE - 3 SPECIFICATION: 12 5200 FURNISHINGS AND UPHOLSTRY MANUFACTURER: CARNEGIE PRODUCT: MAZE PRINT COLOR: 104	PT-8	PAINT TYPE - 8 SPECIFICATION: 09 9000 PAINTING AND COATING MANUFACTURER: SHERWIN-WILLIAMS COLOR: SW 6480 LAGOON
B-2	RUBBER BASE TYPE - 2 SPECIFICATION: 09 6500 RESILIENT FLOORING MANUFACTURER: ROPPE COLOR: 123 CHARCOAL PRODUCT: 700 SERIES HEIGHT: 4 INCHES	LVT-1	LUXURY VINYL TILE TYPE - 1 SPECIFICATION: 09 6510 LUXURY VINYL TILE MANUFACTURER: PATCRAFT COLLECTION: TIMBER GROVE II STYLE: V3 COLOR: SHADY GROVE 05012 SIZE: 5.96 X 48 INCHES	RS-1	VINYL SHEET TYPE - 1 SPECIFICATION: 09 6813 RESILIENT FLOORING MANUFACTURER: MANNINGTON COMMERCIAL COLLECTION: PARADIGM II STYLE: FLOW COLOR: PRECEDENT PD317 PATTERN REPEAT: 36 X 72 INCHES
CPT-1	CARPET TILE TYPE - 1 SPECIFICATION: 09 6813 TILE CARPETING MANUFACTURER: SHAW CONTRACT COLLECTION: LIVING SYSTEMS STYLE: SOURCE TILE SIZE: 9 X 36 INCHES COLOR: CALM 05580	LVT-2	LUXURY VINYL TILE TYPE - 2 SPECIFICATION: 09 6510 LUXURY VINYL TILE MANUFACTURER: PATCRAFT COLLECTION: TIMBER GROVE II STYLE: V2 COLOR: MERIGOLD 00230 SIZE: 5.96 X 48 INCHES	SS-1	SOLID SURFACE TYPE - 1 SPECIFICATION: 12 3600 COUNTERTOPS MANUFACTURER: CORIAN COLOR: GRAY ONYX
CPT-2	CARPET TILE TYPE - 2 SPECIFICATION: 09 6813 TILE CARPETING MANUFACTURER: SHAW CONTRACT COLLECTION: LIVING SYSTEMS STYLE: RESPOND COLOR TILE SIZE: 9 X 36 INCHES COLOR: CALM OCEANS 05405	PL-1	PLASTIC LAMINATE TYPE - 1 SPECIFICATION: 06 0630 DECORATIVE PLASTIC LAMINATE MANUFACTURER: WILSONART FINISH: LINEARITY FINISH COLOR: COSMIC STRANDZ 4041K-18	SS-2	SOLID SURFACE TYPE - 2 SPECIFICATION: 12 3600 COUNTERTOPS MANUFACTURER: CORIAN COLOR: JUNIPER
CPT-3	CARPET TILE TYPE - 3 SPECIFICATION: 09 6813 TILE CARPETING MANUFACTURER: MANNINGTON COMMERCIAL COLLECTION: HEIRLOOM STYLE: RELIC COLOR: 32640 TRUST SIZE: 12 X 48 INCHES	PL-2	PLASTIC LAMINATE TYPE - 2 SPECIFICATION: 06 0630 DECORATIVE PLASTIC LAMINATE MANUFACTURER: WILSONART FINISH: CASUAL RUSTIC COLOR: ITALIAN SILVER ASH 8217	SS-3	SOLID SURFACE TYPE - 3 SPECIFICATION: 12 3600 COUNTERTOPS MANUFACTURER: CORIAN COLOR: RAIN CLOUD
CPT-4	CARPET TILE TYPE - 4 SPECIFICATION: 09 6813 TILE CARPETING MANUFACTURER: MANNINGTON COMMERCIAL COLLECTION: HEIRLOOM STYLE: RELIC COLOR: 34636 UNION SIZE: 12 X 48 INCHES	PT-1	PAINT TYPE - 1 SPECIFICATION: 09 9000 PAINTING AND COATING MANUFACTURER: SHERWIN-WILLIAMS COLOR: SW 7005 PURE WHITE	WD-1	WOOD CEILING PANELS TYPE - 1 SPECIFICATION: 09 5426 WOOD CEILINGS MANUFACTURER: 9 WOOD SKU: 5100 PERF TILE STYLE: 5132-8 SIZE: 2 X 4 FEET
CPT-5	CARPET TILE TYPE - 5 SPECIFICATION: 09 6813 TILE CARPETING MANUFACTURER: MANNINGTON COMMERCIAL COLLECTION: HEIRLOOM STYLE: MEMENTO COLOR: 34636 UNION SIZE: 12 X 48 INCHES	PT-2	PAINT TYPE - 2 SPECIFICATION: 09 9000 PAINTING AND COATING MANUFACTURER: SHERWIN-WILLIAMS COLOR: SW 7658 GRAY CLOUDS	WP-1	WOOD WALL PANELS TYPE - 1 SPECIFICATION: 06 2000 FINISH CARPENTRY SPECIES: TO MATCH EXISTING WOOD WALL PANELS FINISH: TO MATCH EXISTING WOOD WALL PANELS



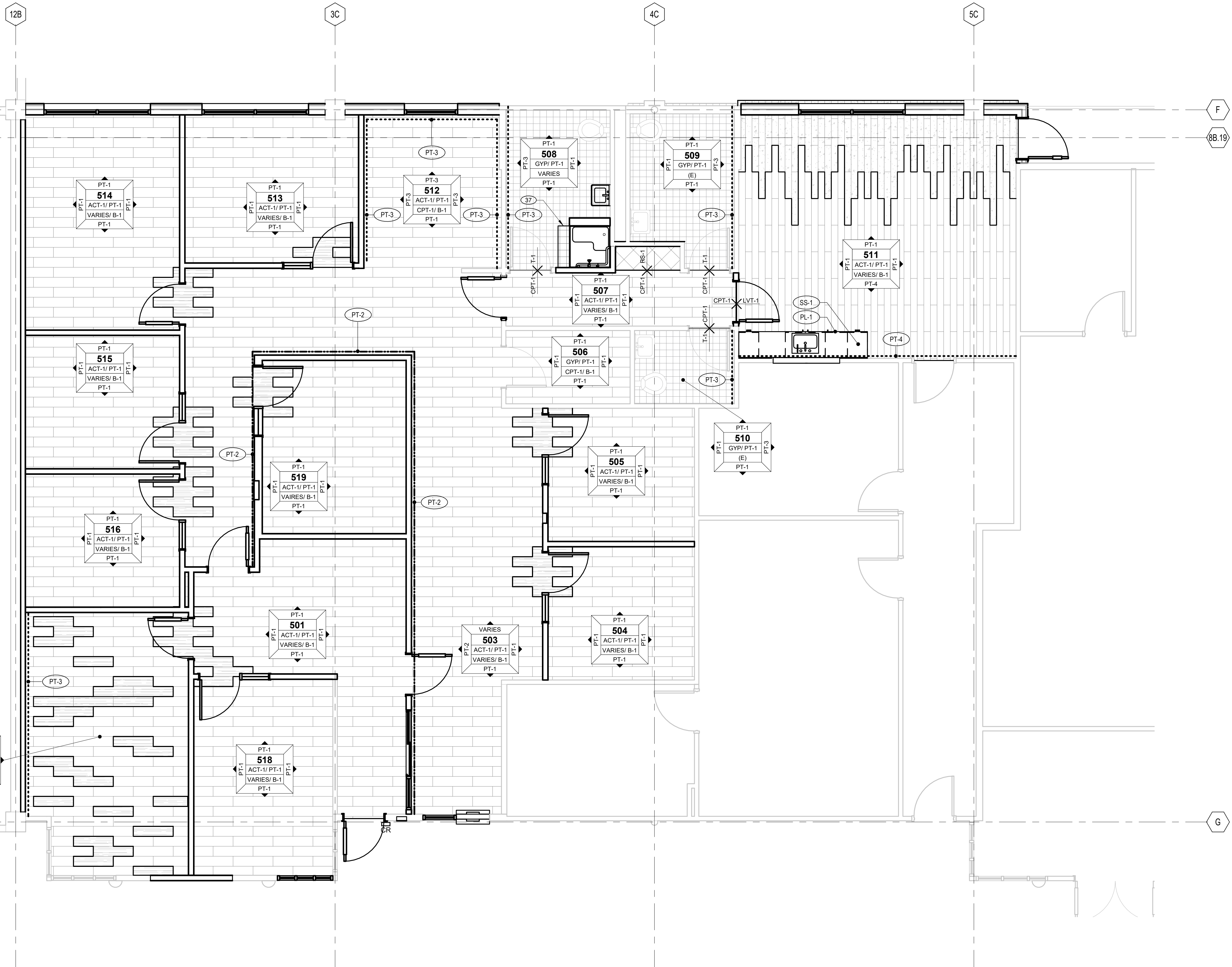
CONSTRUCTION DRAWINGS
 SPRINGFIELD CITY HALL RENOVATION
 PROJECT #: 2125.00
 CITY OF SPRINGFIELD
 225 5TH STREET SPRINGFIELD, OR 97477

SHEET TITLE:
ROOM FINISH AND MATERIALS LEGEND

REVISIONS:
 # DESCRP. DATE

ISSUE DATE: 09.28.2023

A500



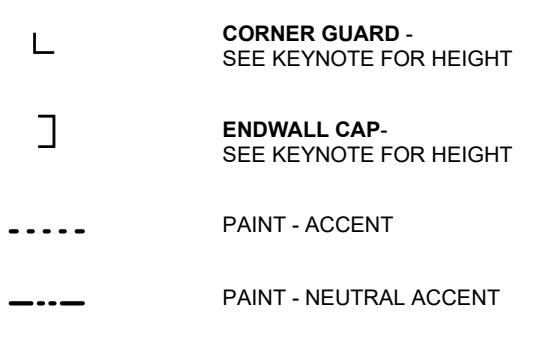
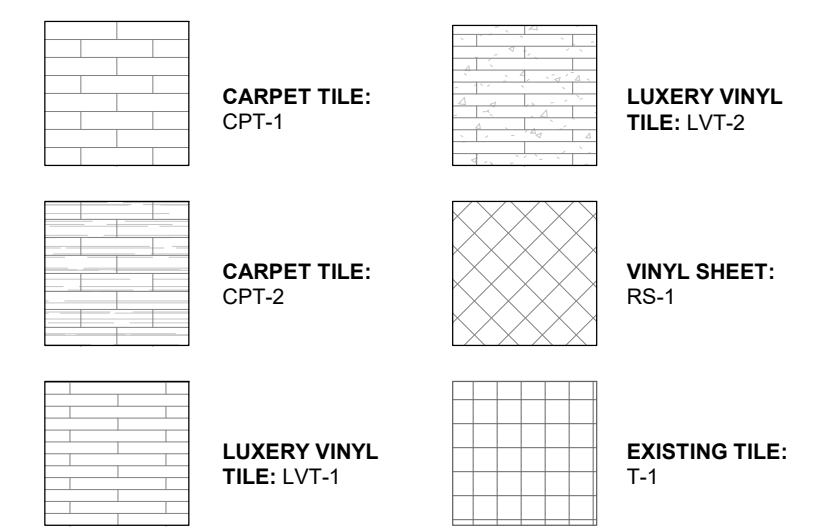
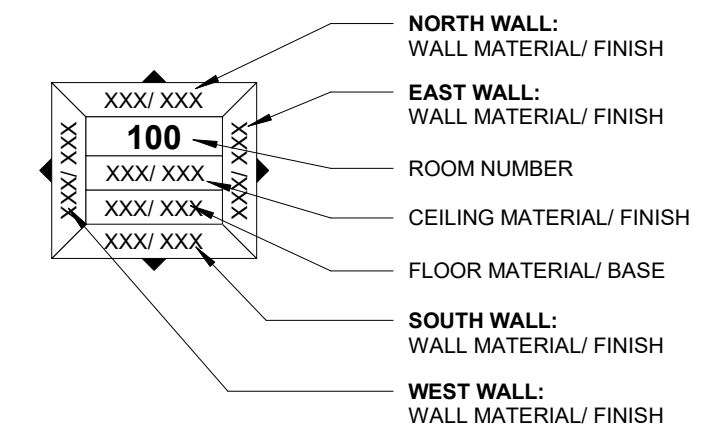
GENERAL NOTES - FINISH SCHEDULE

A WHERE "VARIES" SEE INTERIOR ELEVATION.

KEYNOTES

37 INSTALL NEW TILE TO MATCH EXISTING

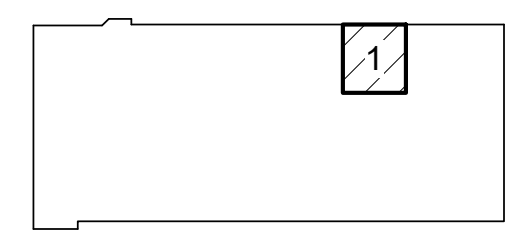
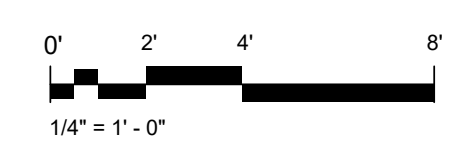
FINISH PLAN LEGEND



FINISH TAG

- (B-1) 4" RUBBER BASE
- (PL-1) PLASTIC LAMINATE TYPE - 1
- (PT-1) PAINT COLOR - TYPE 1 WHITE
- (PT-2) PAINT COLOR - TYPE 2 NEUTRAL ACCENT
- (PT-3) PAINT COLOR - TYPE 3 ACCENT
- (PT-4) PAINT COLOR - TYPE 4 ACCENT
- (SS-1) SOLID SURFACE TYPE - 1

1 FINISH PLAN - CM OFFICE
1/4" = 1'-0"

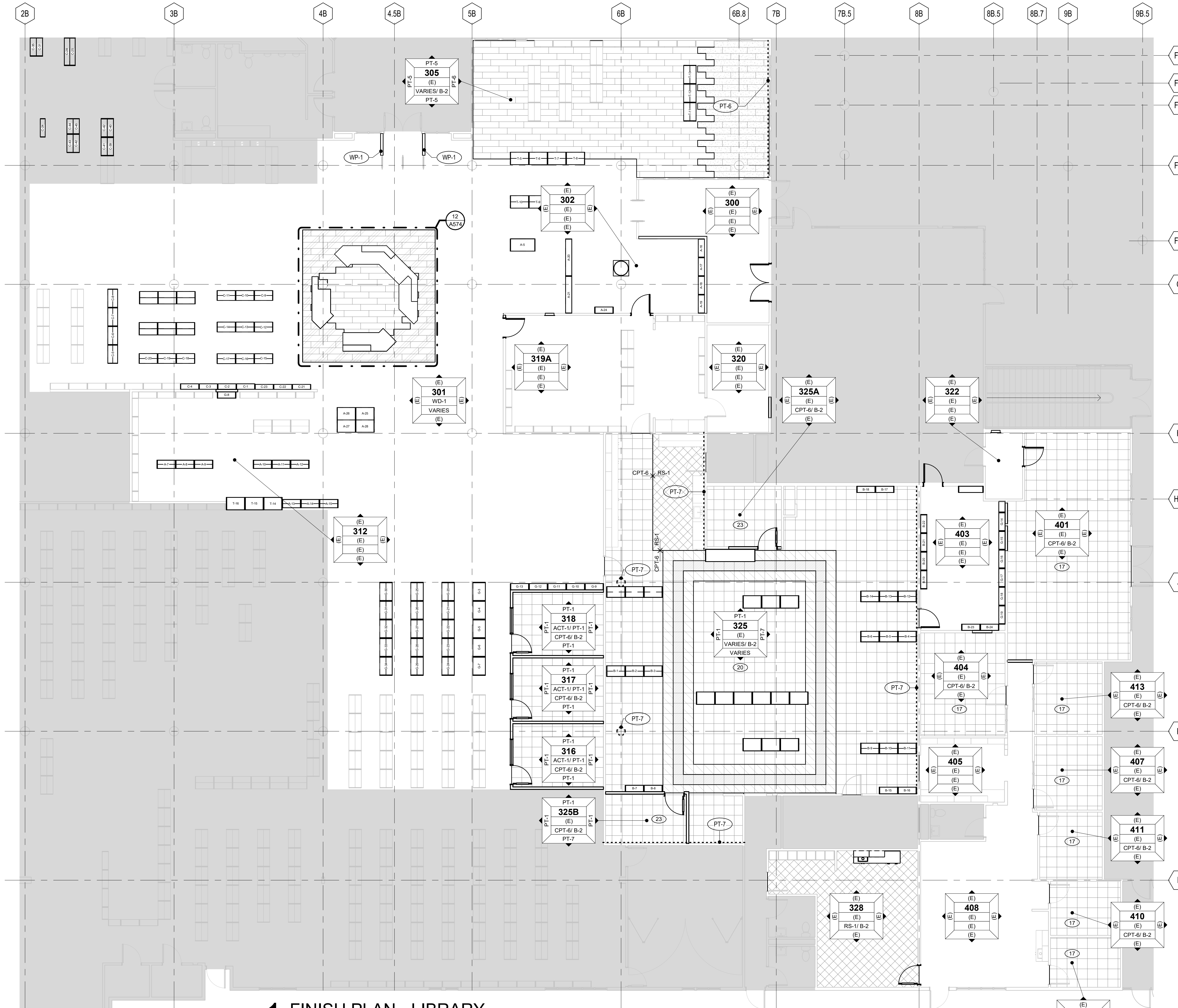


KEYPLAN



REVISIONS:

#	DESCRP.	DATE



1 FINISH PLAN - LIBRARY
1/8" = 1'-0"

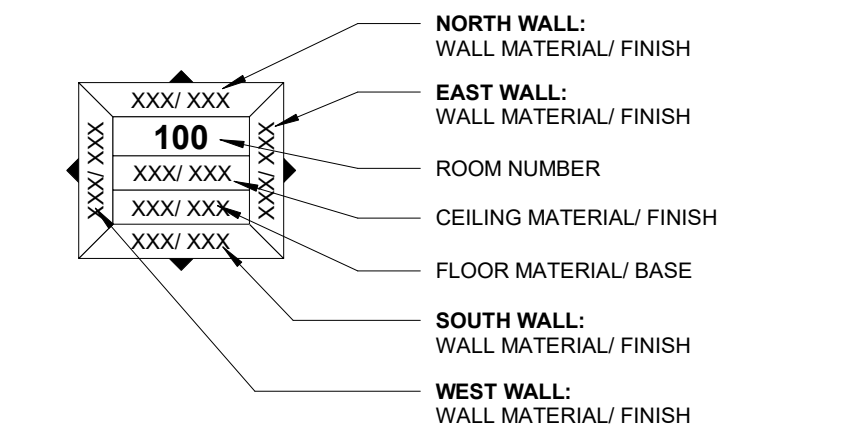
GENERAL NOTES - FINISH SCHEDULE

A WHERE "VARIES" SEE INTERIOR ELEVATION.

KEYNOTES

- 17 ADD ALT - PROVIDE NEW CARPET IN (E) OFFICE
- 20 ADD ALT - INSTALL NEW CARPET IN LIBRARY STAFF
- 23 ADD ALT - INSTALL NEW CARPET IN OFFICE

FINISH PLAN LEGEND

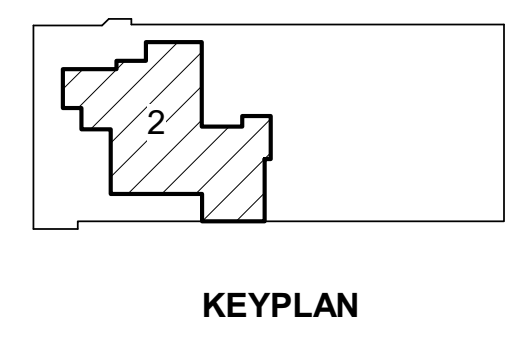
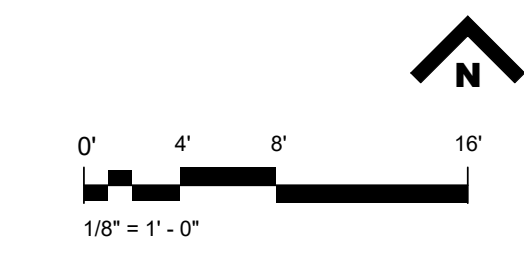


- | | | | |
|--|-----------------------------|--|--------------------|
| | EXISTING FLOORING TO REMAIN | | CARPET TILE: CPT-6 |
| | CARPET TILE: CPT-3 | | CARPET TILE: CPT-7 |
| | CARPET TILE: CPT-4 | | CARPET TILE: CPT-8 |
| | CARPET TILE: CPT-5 | | VINYL SHEET: RS-1 |

- CORNER GUARD - SEE KEYNOTE FOR HEIGHT
- ENDWALL CAP - SEE KEYNOTE FOR HEIGHT
- PAINT - ACCENT
- PAINT - NEUTRAL ACCENT

FINISH TAG

- | | | | |
|------|----------------------------|------|------------------------------|
| B-2 | 4" RUBBER BASE | PT-6 | PAINT COLOR - TYPE 6 ACCENT |
| FA-1 | UPHOLSTERY FABRIC - TYPE 1 | PT-7 | PAINT COLOR - TYPE 7 ACCENT |
| FA-2 | UPHOLSTERY FABRIC - TYPE 2 | PT-8 | PAINT COLOR - TYPE 8 ACCENT |
| FA-3 | UPHOLSTERY FABRIC - TYPE 3 | SS-2 | SOLID SURFACE TYPE - 2 |
| PL-2 | PLASTIC LAMINATE TYPE - 2 | SS-3 | SOLID SURFACE TYPE - 3 |
| PT-1 | PAINT COLOR - TYPE 1 WHITE | WD-1 | WOOD CEILING PANELS TYPE - 1 |
| PT-5 | PAINT COLOR - TYPE 5 WHITE | WP-1 | WOOD WALL PANEL TYPE - 1 |



CONSTRUCTION DRAWINGS
SPRINGFIELD CITY HALL RENOVATION
 PROJECT #: 2125.00
 CITY OF SPRINGFIELD
 225 5TH STREET SPRINGFIELD, OR 97477

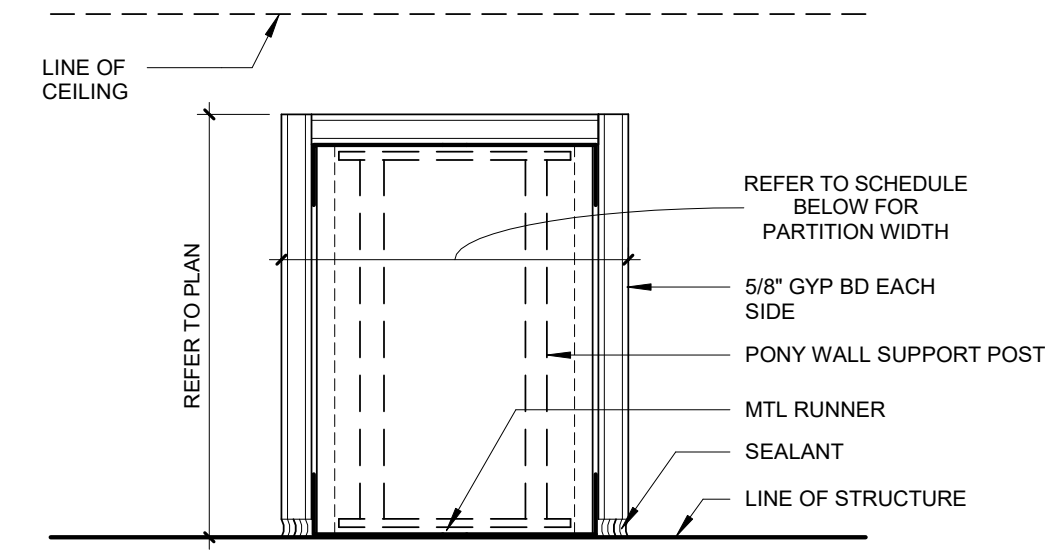
SHEET TITLE:
FINISH PLAN - LIBRARY

REVISIONS:
 # DESCRP. DATE

ISSUE DATE: 09.28.2023

A502

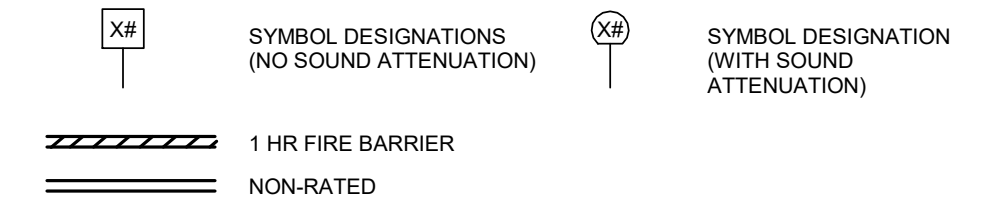
TYPE "J"



FLOOR PLAN DESIGNATION NO SOUND ATTENUATION	FLOOR PLAN DESIGNATION WITH SOUND ATTENUATION	STUD SIZE	PART WIDTH	FIRE RATING	UL LISTING	SOUND TRANS CLASS	REMARKS
J3		3 5/8"	4 7/8"	NON-RATED	N/A	N/A	

GENERAL NOTES

- PARTITIONS ARE DISTINGUISHED ON FLOOR PLANS BY SYMBOL DESIGNATION, GRAPHIC DESIGNATION OR A COMBINATION OF BOTH DESIGNATIONS.
- THERE ARE TWO TYPES OF SYMBOL DESIGNATIONS, ONE FOR PARTITIONS NOT REQUIRING SOUND ATTENUATION AND ANOTHER FOR PARTITIONS WHICH REQUIRE SOUND ATTENUATION. REFER TO PARTITION MATRICES FOR SOUND ATTENUATION BLANKET (SAB) MINIMUM THICKNESS FOR STC INDICATED.

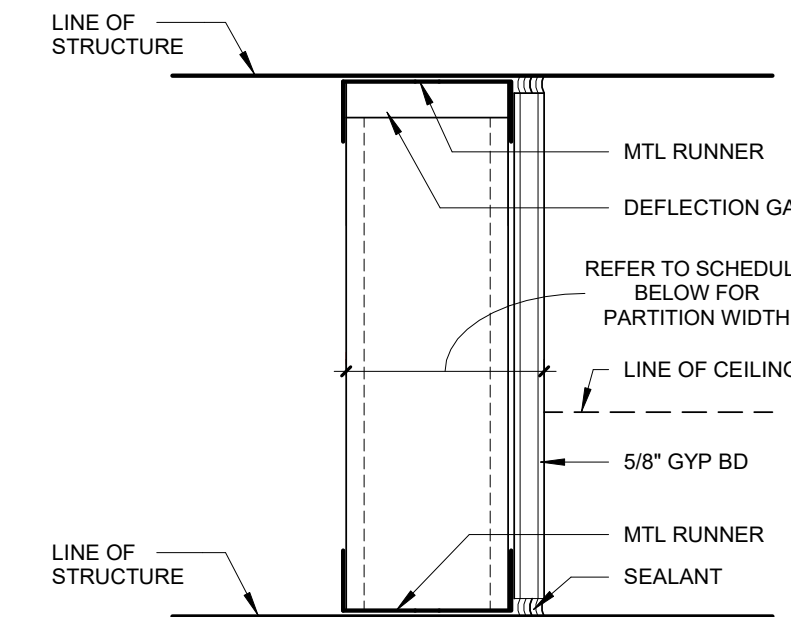


NUMERIC CHARACTER	STUD WIDTH	CMU WIDTH
1	1 5/8"	
2	2 1/2"	
3	3 5/8"	
4	4"	3 5/8"
6	6"	5 5/8"
8	8"	7 5/8"
10		9 5/8"
12		11 5/8"

- IF NO SYMBOL DESIGNATION IS PROVIDED, THE STUD SIZE WILL BE 3 5/8".
- "LINE OF STRUCTURE" INDICATED FOR EACH PARTITION IS DIAGRAMMATIC ONLY AND DOES NOT INDICATE EXACT CONSTRUCTION CONDITIONS OR GEOMETRY.
- ALL DIMENSIONS ON THIS SHEET ARE FROM FACE OF GYPSUM BOARD TO FACE OF GYPSUM BOARD. REFER TO PARTITION MATRICES FOR PARTITION WIDTH DIMENSIONS UNLESS INDICATED TO BE SHOWN ON PLAN.
- SEALANT:
 - FIRE RESISTANCE RATED PARTITIONS SHALL USE RATED FIRE/SMOKE FIRE RESISTANT FILL MATERIAL IN CONJUNCTION WITH AN APPROPRIATE RATED FIRE/SMOKE FIRE STOPPING SYSTEM.
 - NON-RATED PARTITIONS AND NON-RATED SMOKE RESISTANT PARTITIONS SHALL USE ACOUSTICAL SEALANT.
- INSULATION - HEAD CONDITIONS AT FLOOR/ROOF DECK
 - FIRE RESISTANCE RATED PARTITIONS SHALL USE MINERAL WOOL INSULATION.
 - NON-RATED PARTITIONS REQUIRING SOUND ATTENUATION SHALL USE SOUND ATTENUATION BLANKETS (SAB).
 - PROVIDE FULL THICKNESS INSULATION INSIDE ALL STUD BOX BEAMS AND HEADERS WHICH OCCUR IN WALLS WITH SOUND ATTENUATION.
- FOR PARTITIONS INDICATED TO RECEIVE SOUND ATTENUATION BLANKETS (SAB), EXTEND SAB TO FULL HEIGHT OF PARTITION UNLESS OTHERWISE INDICATED. FLOOR TRACK TO BE SET IN A CONT BED OF SEALANT.
- FIRE RESISTANT RATINGS ARE TO SURROUND ALL OPENINGS IN RATED PARTITIONS.
- FIRE RESISTANT PARTITIONS SHALL EXTEND AND SEAL TO INSIDE FACE OF EXTERIOR SHEATHING, INCLUDING EXTENSIONS THROUGH SOFFITS.
- REFER TO TOILET ACCESSORIES SHEET AND CASEWORK SHEET FOR MOUNTING DETAIL INFORMATION.
- REFER TO THE METAL FABRICATIONS DETAILS FOR MF REFERENCES IN PARTITIONS SECTION.
- AT EACH FLOOR ON ALL FIRE WALLS, FIRE BARRIERS, FIRE PARTITIONS, AND SMOKE BARRIERS, STENCIL OR PAINT IN 3" LETTERS ON EACH SIDE OF FIRE/SMOKE BARRIER. THE FOLLOWING NOTE: "FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS".

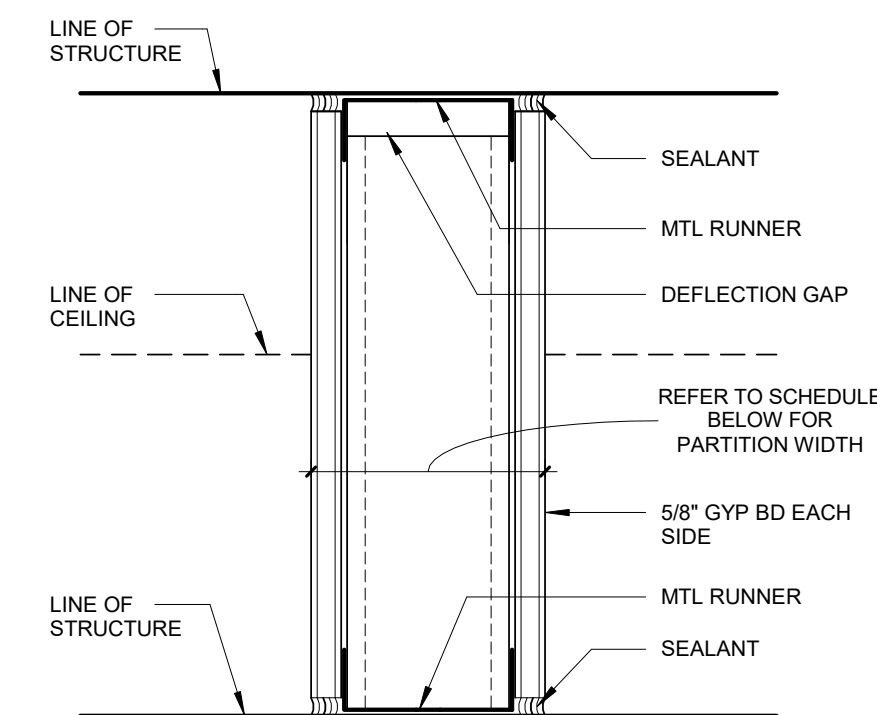
TYPE "F"

TAG PLACEMENT SIDE



FLOOR PLAN DESIGNATION NO SOUND ATTENUATION	FLOOR PLAN DESIGNATION WITH SOUND ATTENUATION	STUD SIZE	PART WIDTH	FIRE RATING	UL LISTING	SOUND TRANS CLASS	REMARKS
F3		3 5/8"	4 1/4"	NON-RATED	N/A	N/A	

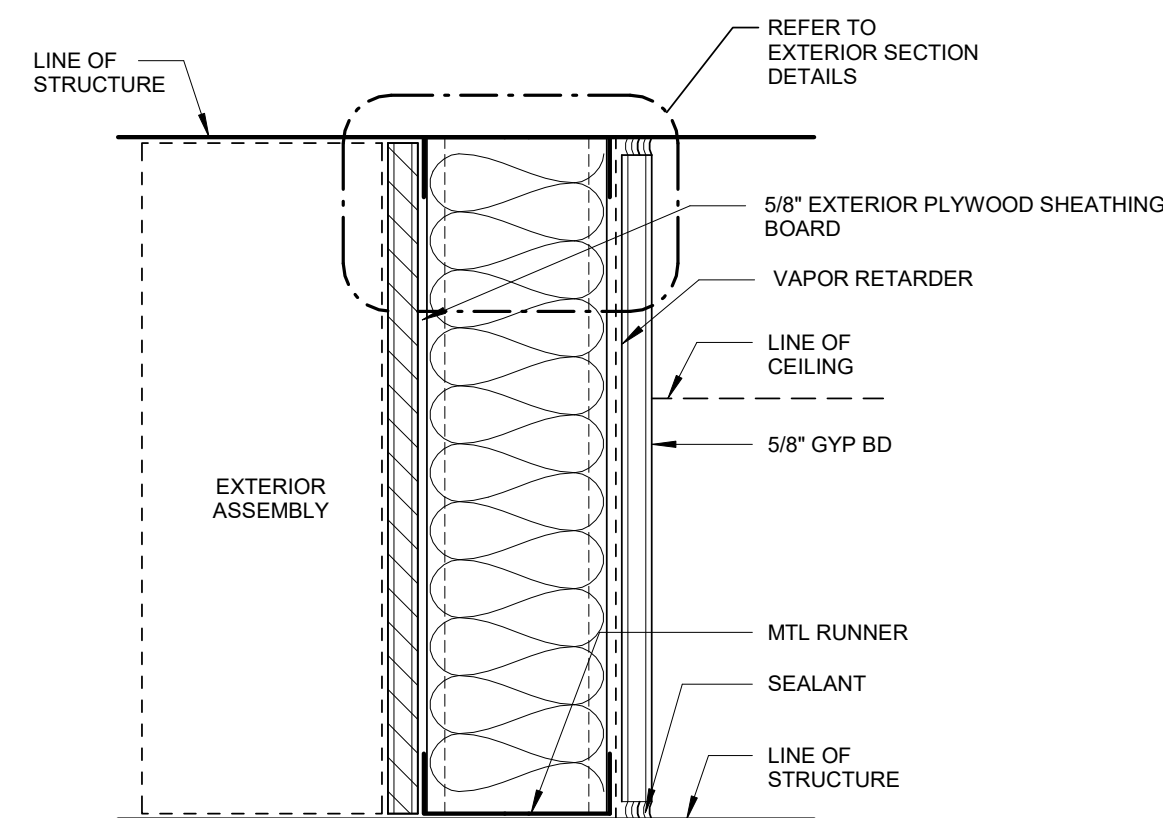
TYPE "A"



FLOOR PLAN DESIGNATION NO SOUND ATTENUATION	FLOOR PLAN DESIGNATION WITH SOUND ATTENUATION	STUD SIZE	PART WIDTH	FIRE RATING	UL LISTING	STC: NO SOUND WITH SOUND	REMARKS
A3	A3	3 5/8"	4 7/8"	NON-RATED	N/A	40 49 WITH 3" SAB	
A6	A6	6"	7 1/4"	NON-RATED	N/A	40 49 WITH 5" SAB	

TYPE "X"

TAG PLACEMENT SIDE



FLOOR PLAN DESIGNATION NO SOUND ATTENUATION	FLOOR PLAN DESIGNATION WITH SOUND ATTENUATION	STUD SIZE	PART WIDTH	FIRE RATING	UL LISTING	STC: NO SOUND WITH SOUND	REMARKS
X4	X4	4"	5 1/4"	NON-RATED	N/A		



CONSTRUCTION DRAWINGS
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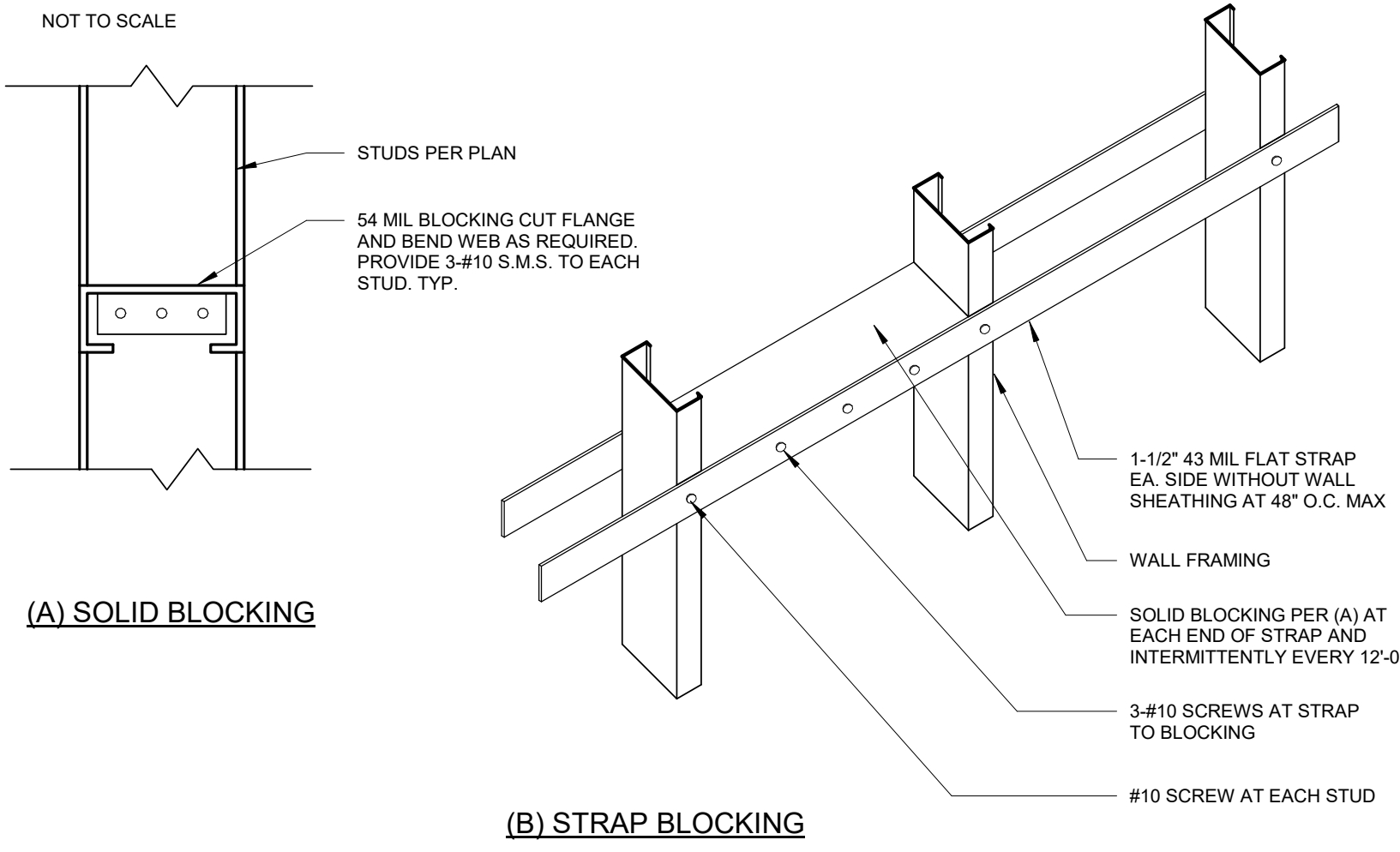
SHEET TITLE:
WALL ASSEMBLY INFORMATION

REVISIONS:
 # DESCRP. DATE

ISSUE DATE: 09.28.2023

A531

8 TYPICAL BRIDGING

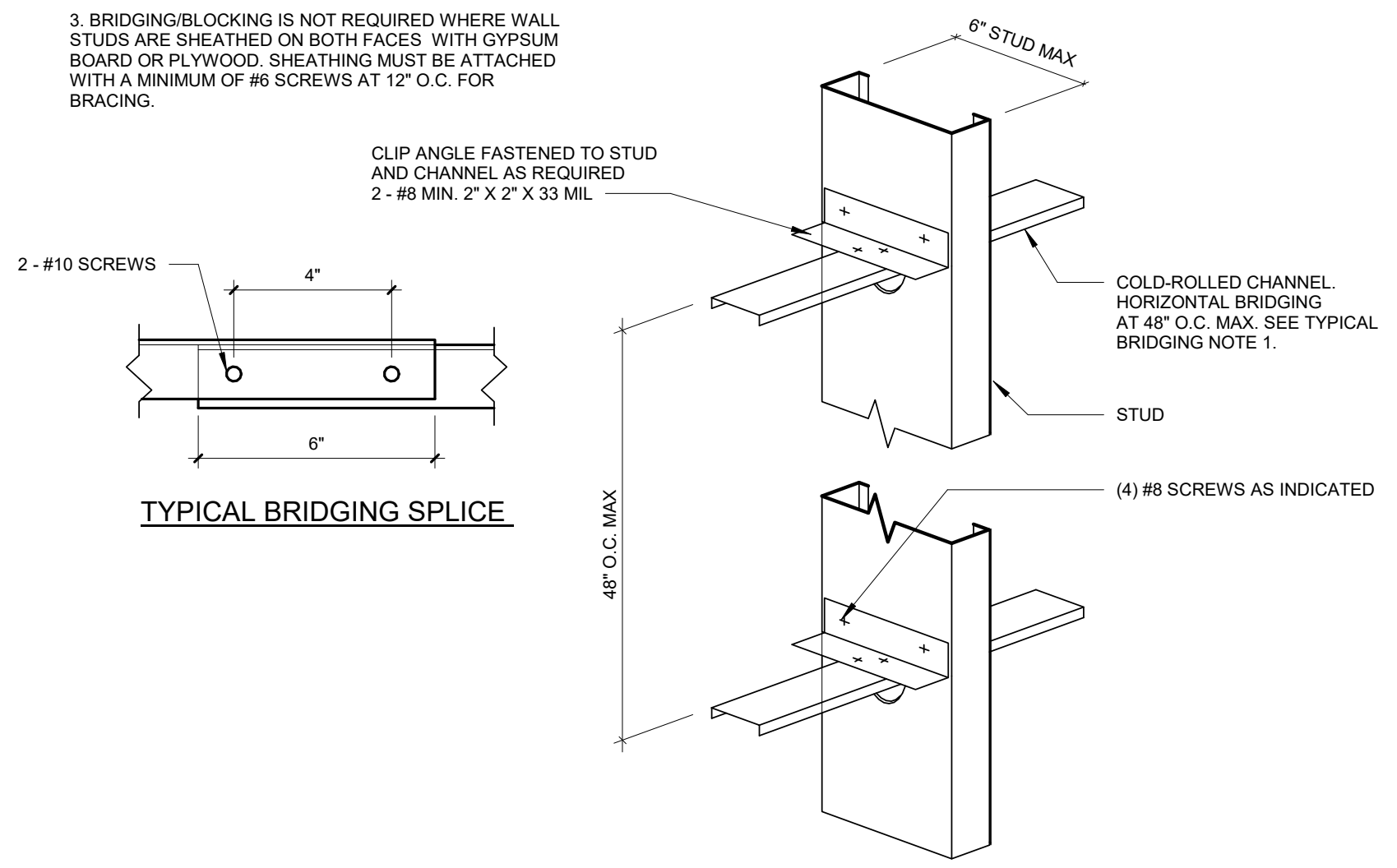


7 TYPICAL STUD BLOCKING

NOT TO SCALE

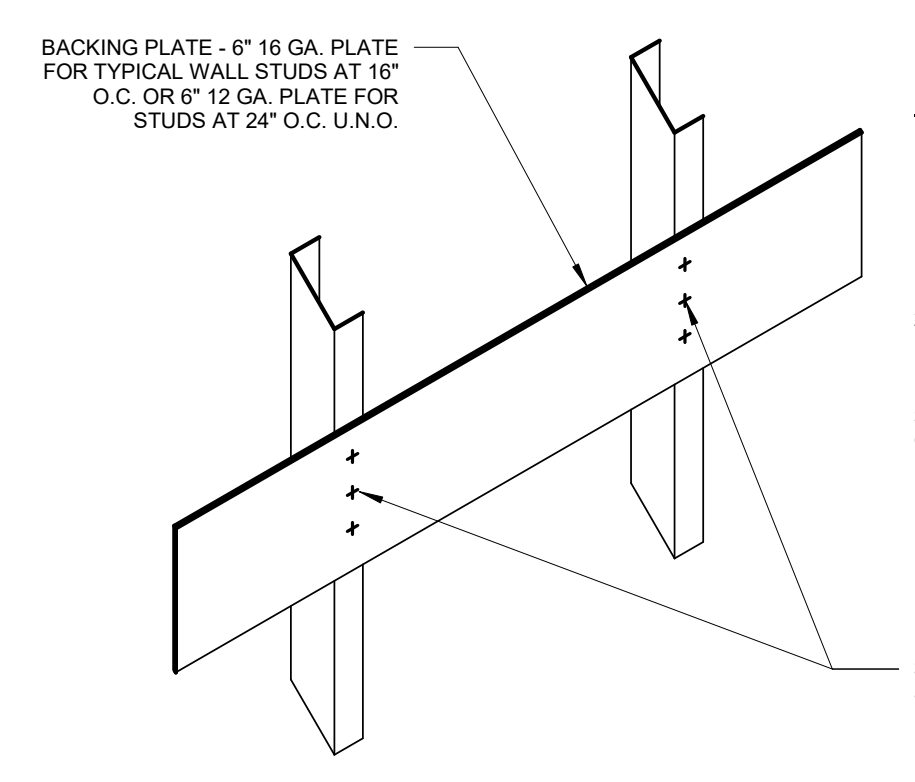
TYPICAL BRIDGING NOTES:

1. FOR 6" STUD USE 2-1/2" X 54 MIL W/ 1/2" FLANGE HORIZONTAL BRIDGING FOR 3-5/8" OR 4" STUD USE 1-1/2" X 54 MIL W/ 1/2" FLANGE HORIZONTAL BRIDGING.
2. STUD BLOCKING PER 7/A532 MAY BE USED IN PLACE OF BRIDGING.
3. BRIDGING/BLOCKING IS NOT REQUIRED WHERE WALL STUDS ARE SHEATHED ON BOTH FACES WITH GYPSUM BOARD OR PLYWOOD. SHEATHING MUST BE ATTACHED WITH A MINIMUM OF #6 SCREWS AT 12" O.C. FOR BRACING.



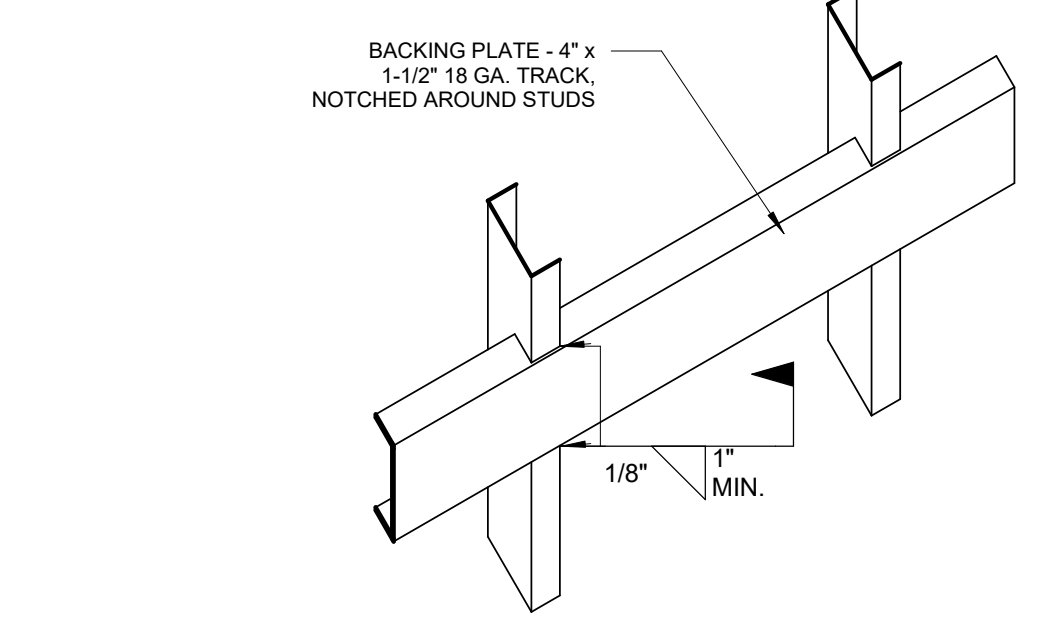
5 BACKING PLATE TYPE B

NOT TO SCALE



4 BACKING PLATE TYPE A

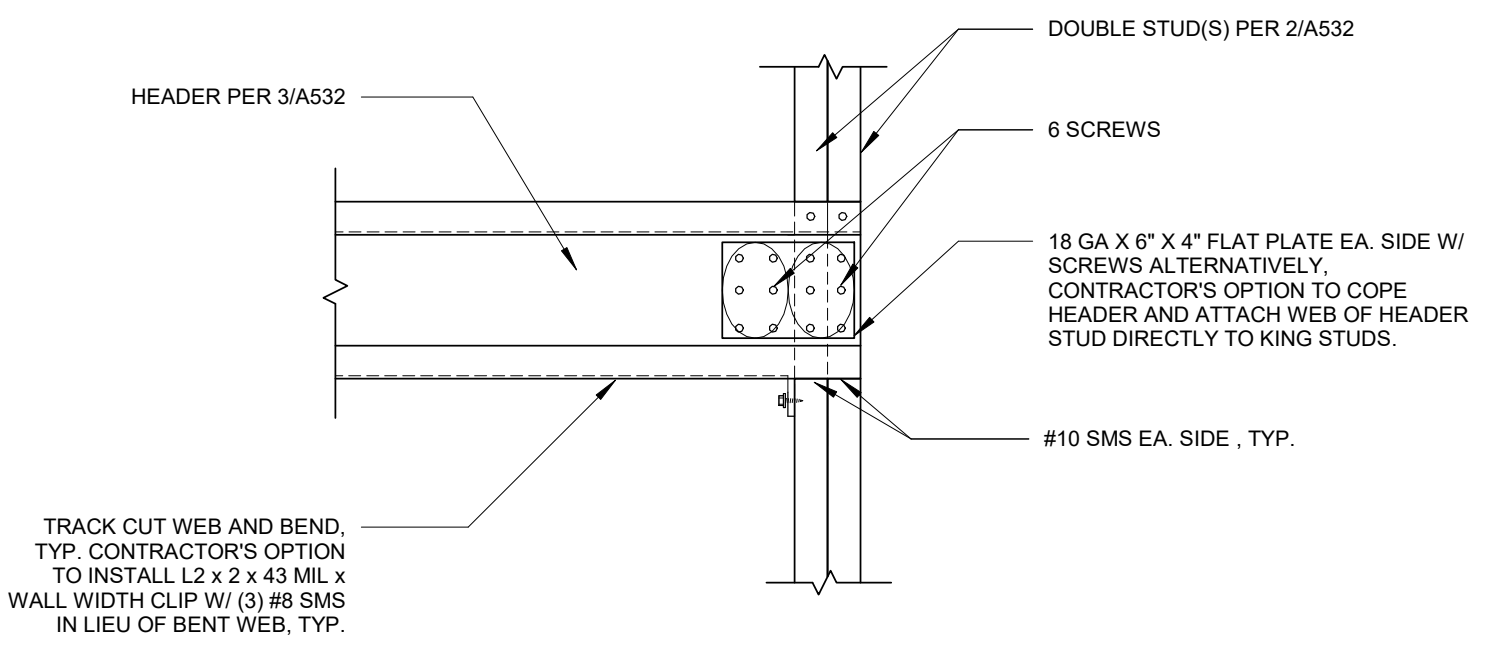
NOT TO SCALE



- NOTES:
1. TYPE 'B' BACKING PLATE FOR UPPER WALL HUNG CABINETS (UP TO 2 SHELVES), BASE CABINETS, SHELVING TO 7'-0", WALL HUNG BENCHES, HANDRAILS, ETC. MAX. WEIGHT - 100 LBS/FT
 2. USE #12 SELF TAPPING SHEET METAL SCREWS WHEN ATTACHING ITEMS TO BACKING PLATE.
 3. WALL STUD FLANGES ARE CONTINUOUS.

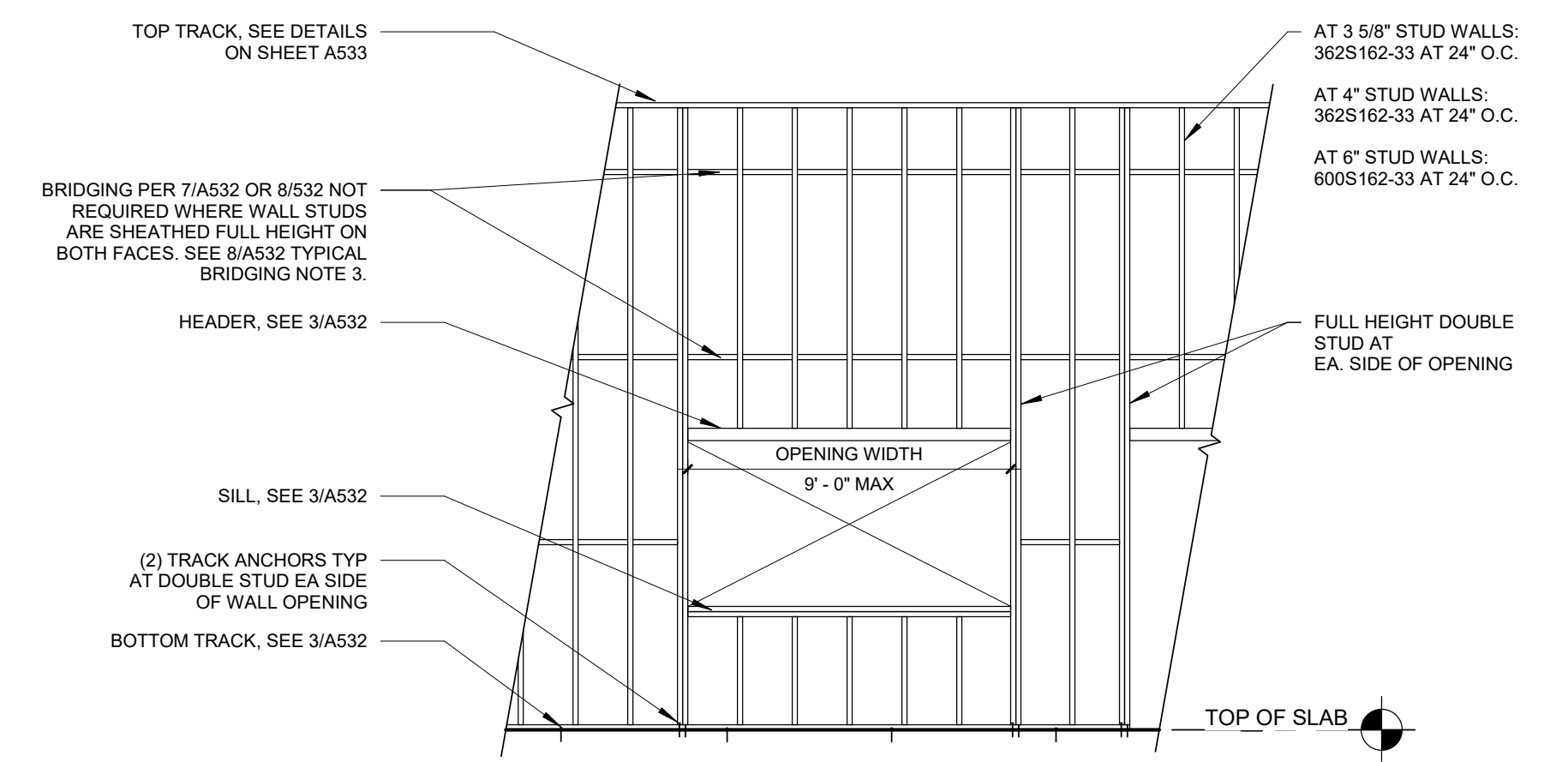
6 BOX HEADER WITH SIDE PLATES

1 1/2" = 1'-0"



2 TYPICAL NON-STRUCTURAL STUD WALL FRAMING

1/4" = 1'-0"



MEMBER DEPTH (IN 1/100 IN.)

THICKNESS IN MILS (IN 1/1000 IN.)

400 S 162-54

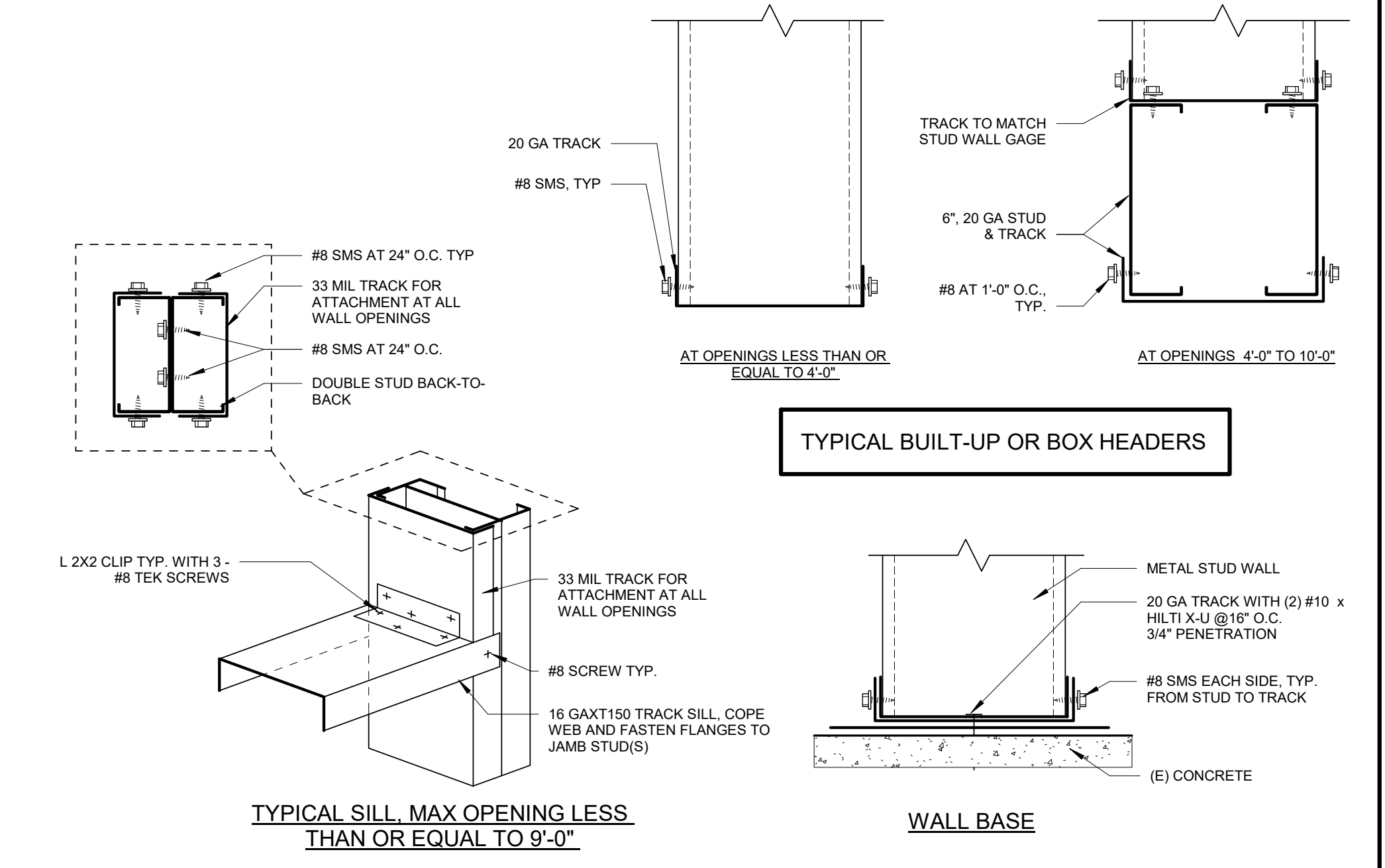
STYLE
S = STUD OR JOIST SECTIONS
T = TRACK SECTIONS
U = CHANNEL SECTIONS
F = FURRING CHANNEL SECTIONS

MINIMUM DELIVERABLE THICKNESS (MILS)	GAUGE	DESIGN THICKNESS (INCHES)
18	25	.0188
27	22	.0283
30	20 (NS)	.0312
33	20 (S)	.0346
43	18	.0451
54	16	.0566
68	14	.0713
97	12	.1017

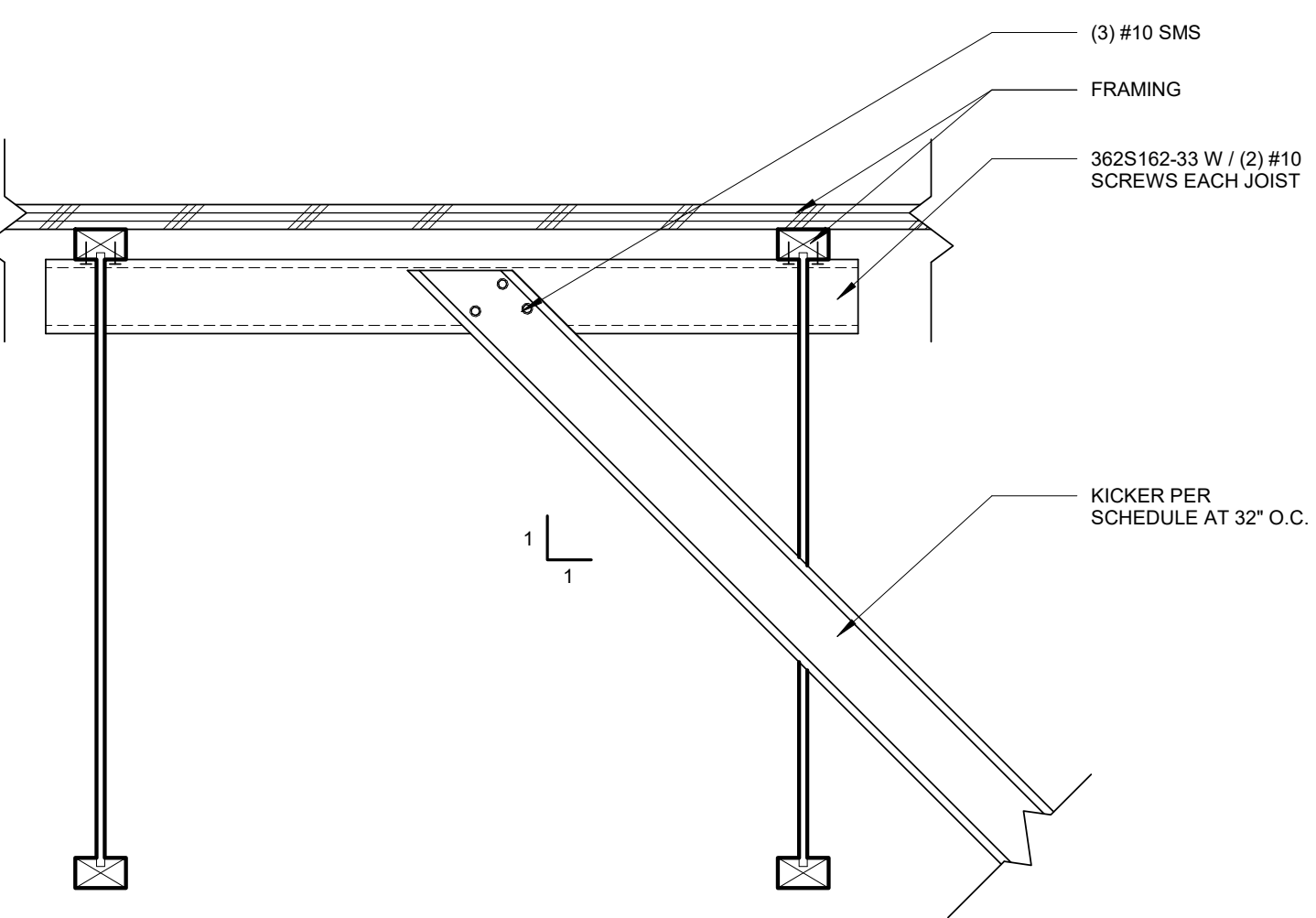
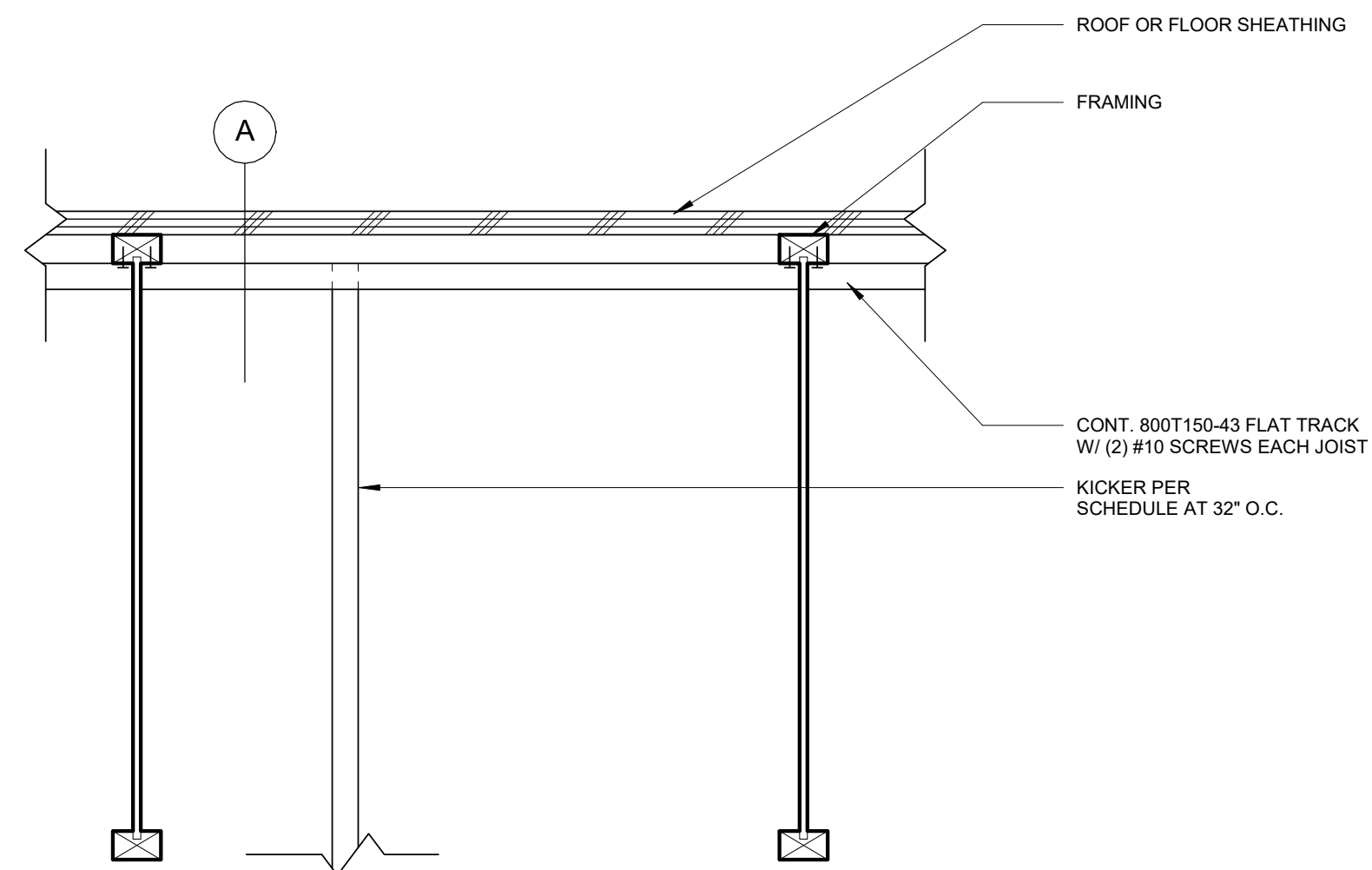
1 TYPICAL LIGHT GAUGE STUD DESIGNATIONS

3 TYPICAL NON-STRUCTURAL INTERIOR WALL DETAILS

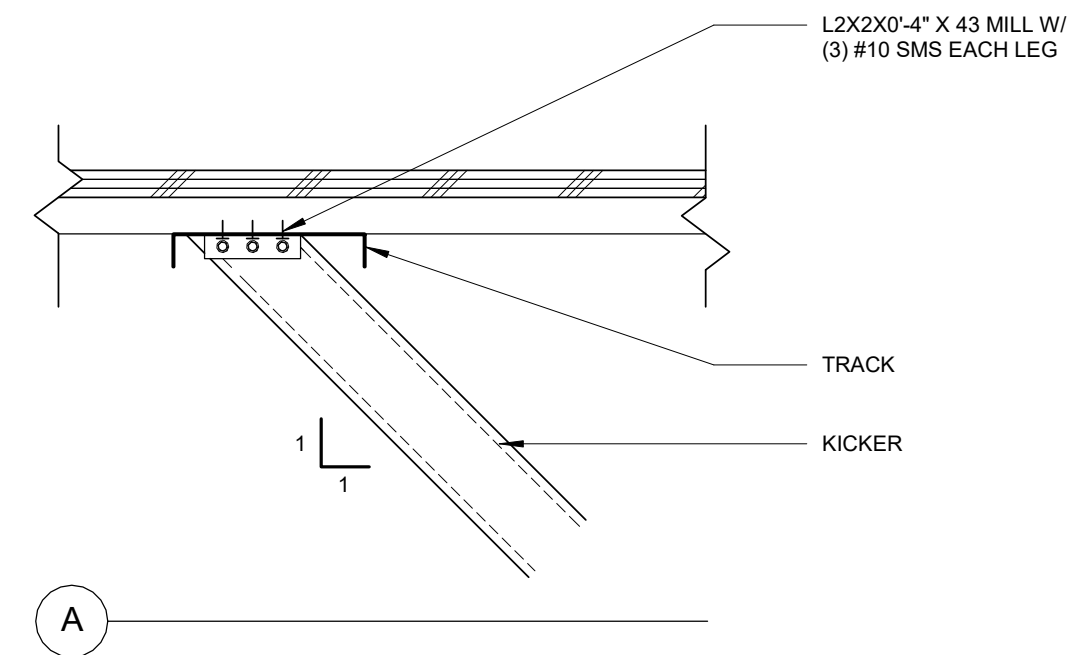
3" = 1'-0"



1



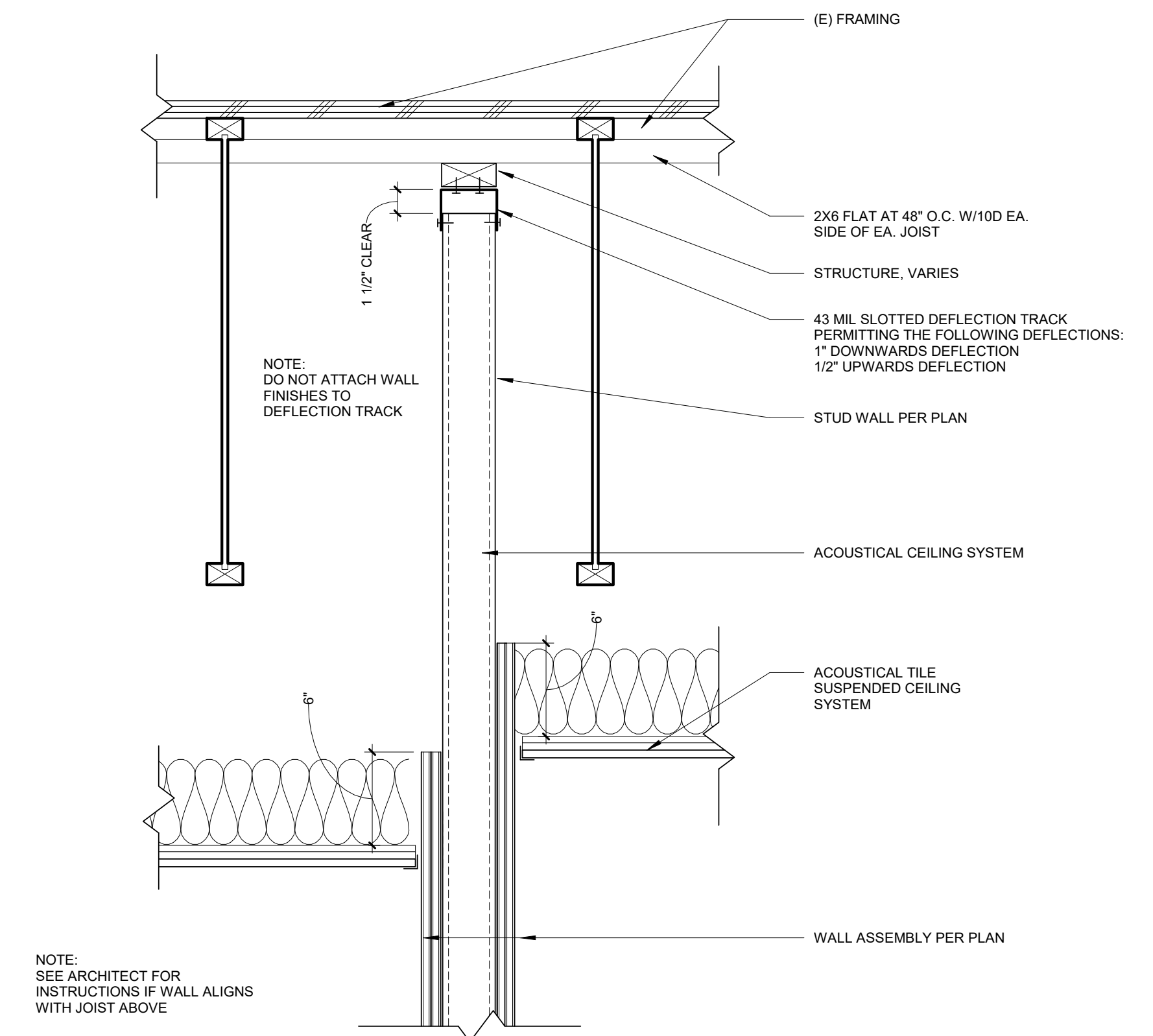
3 TYPICAL KICKER DETAIL AT WOOD JOISTS
1 1/2" = 1'-0"



KICKER SCHEDULE

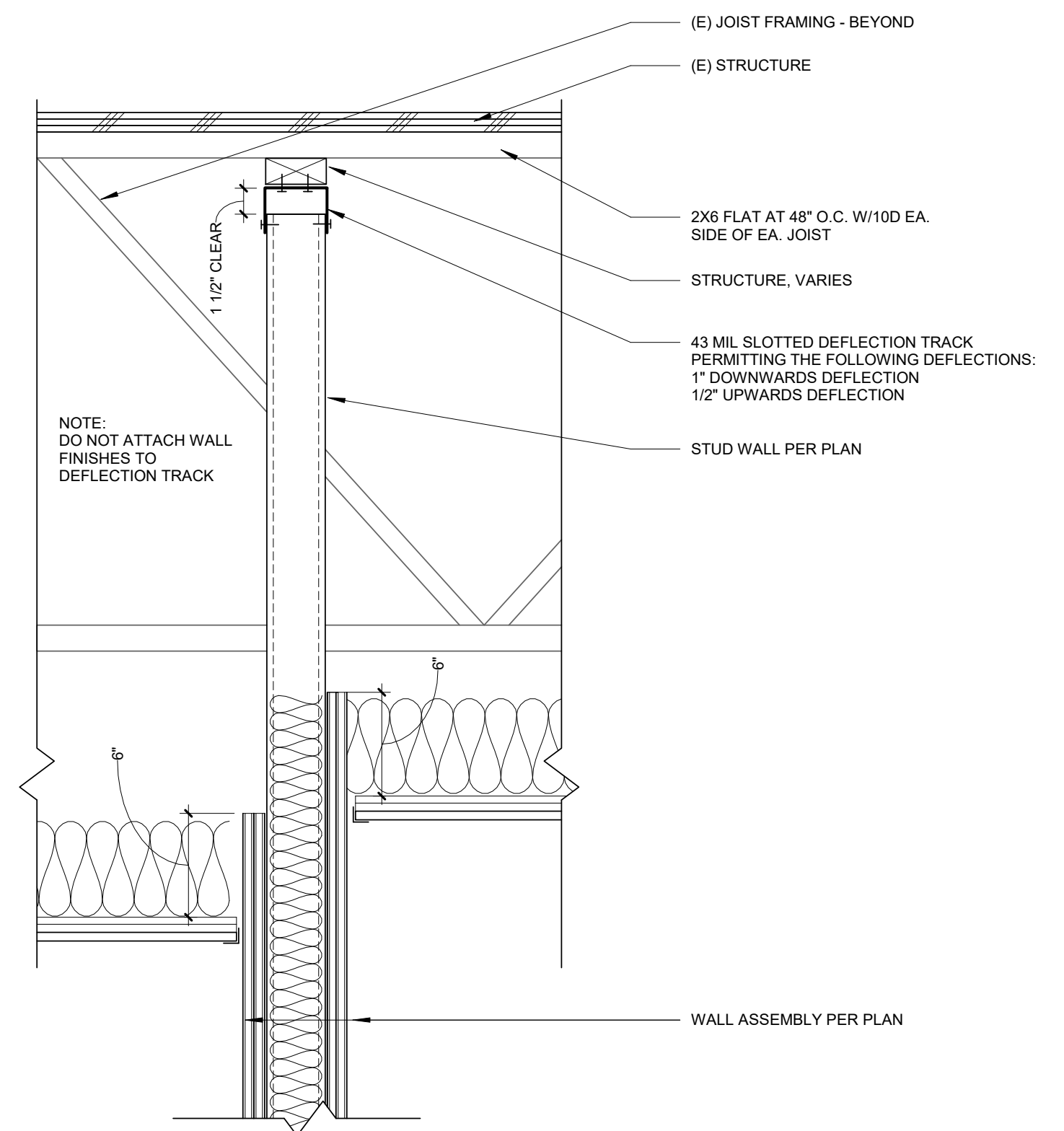
MAX LENGTH	SECTION
10'-0"	362S162-33
12'-0"	362S200-33
14'-0"	362S250-43

2 TOP OF WALL - PARALLEL TO WOOD ROOF JOISTS
1 1/2" = 1'-0"

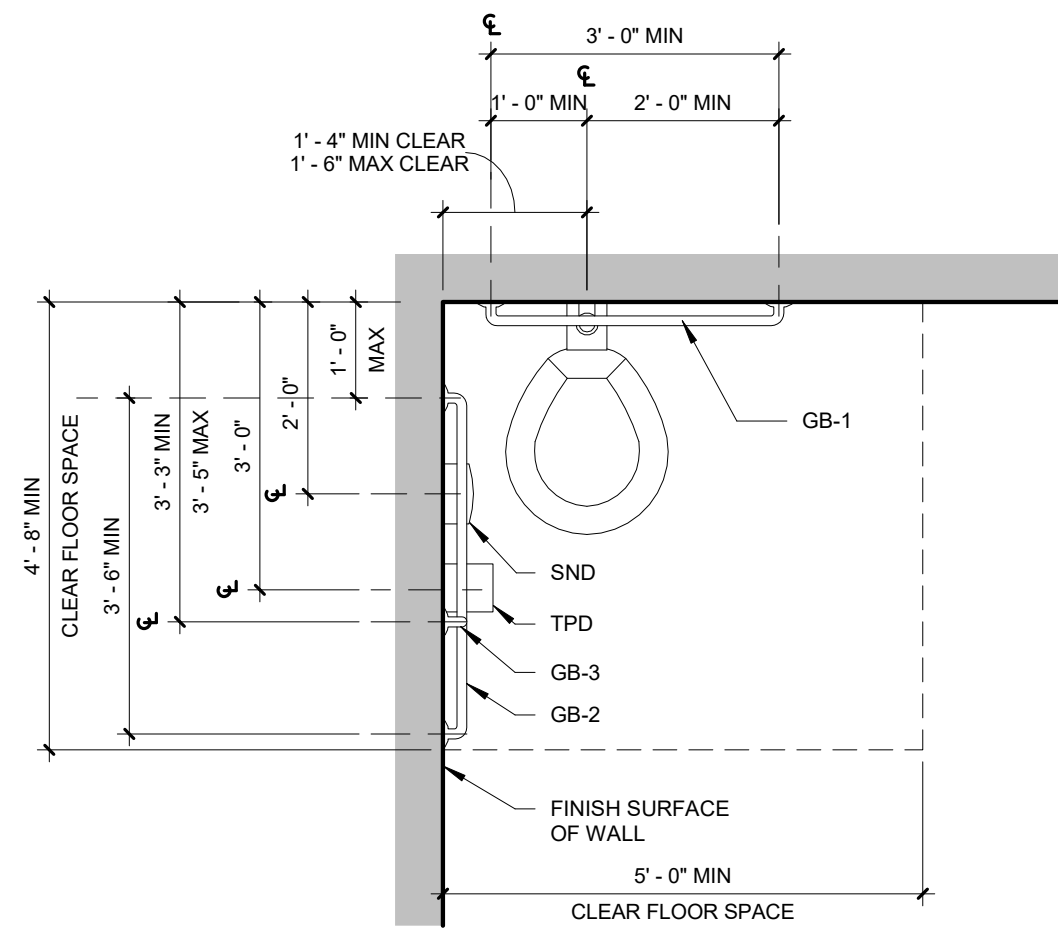


NOTE:
SEE ARCHITECT FOR
INSTRUCTIONS IF WALL ALIGNS
WITH JOIST ABOVE

1 TOP OF WALL - PERPENDICULAR TO WOOD ROOF JOISTS
1 1/2" = 1'-0"

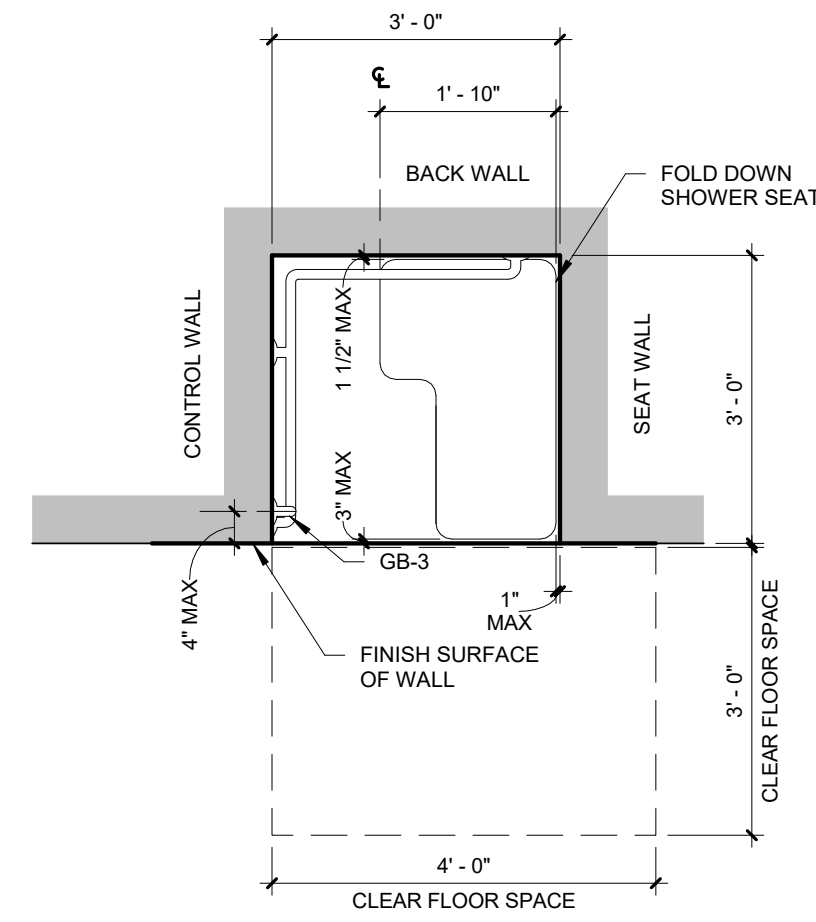


NOTE:
DO NOT ATTACH WALL
FINISHES TO
DEFLECTION TRACK



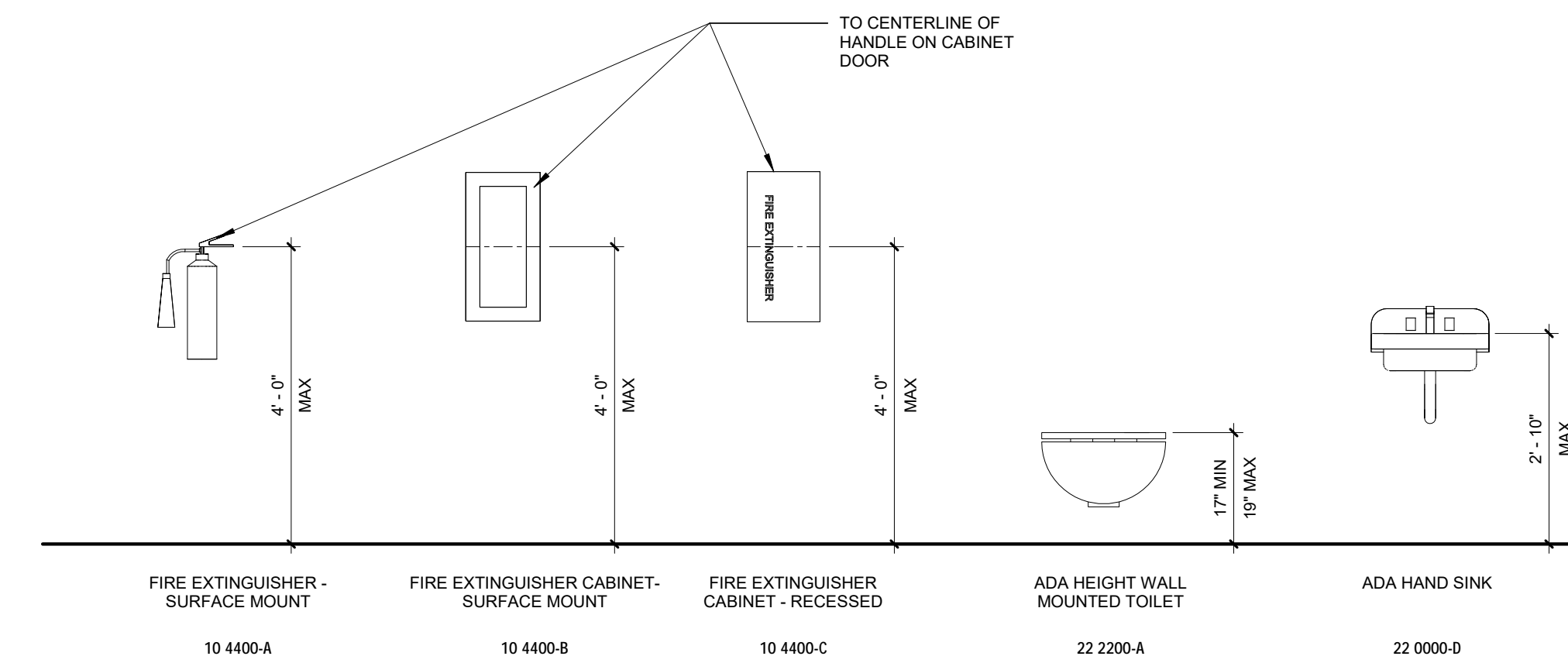
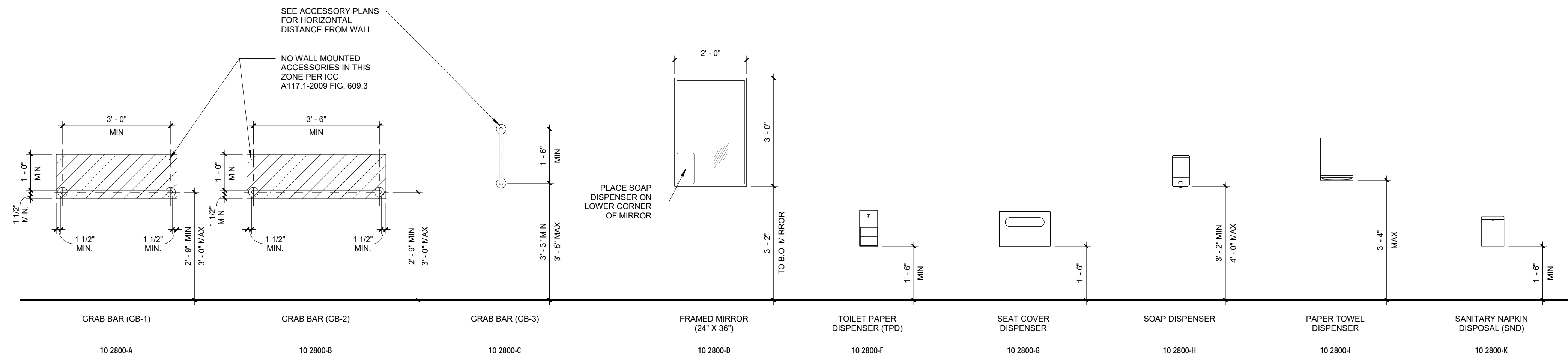
ADA TOILET ACCESSORY PLAN

1/2" = 1'-0"



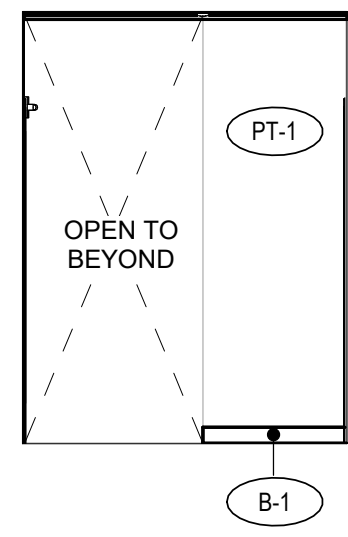
ADA TRANSFER SHOWER PLAN

1/2" = 1'-0"

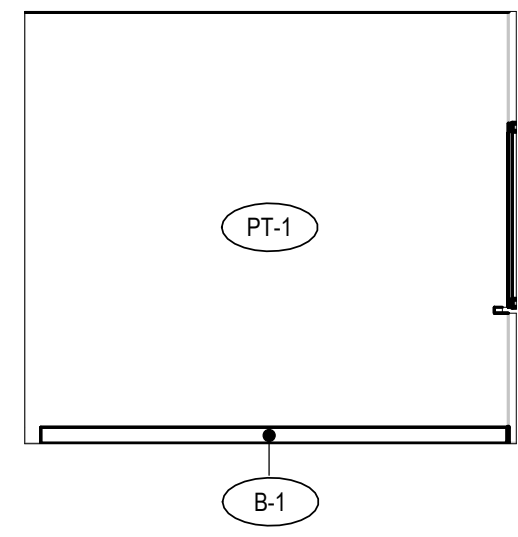


A540 MOUNTING HEIGHT SCHEDULE

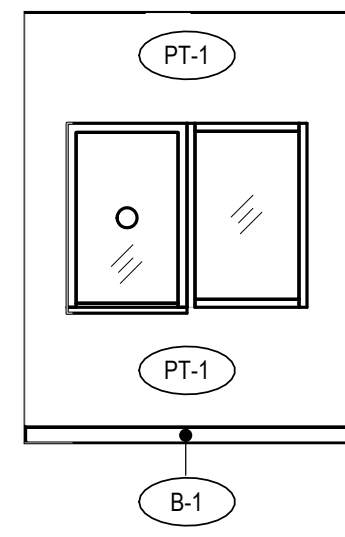
1/2" = 1'-0"



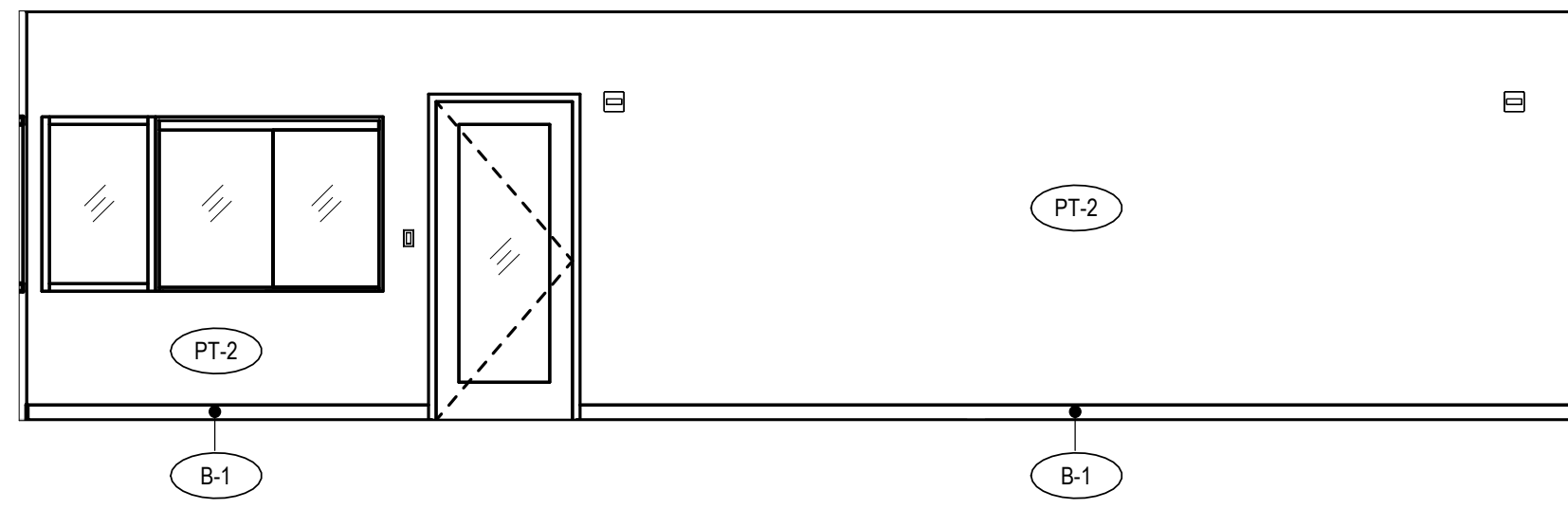
1 RECEPTION - N
1/4" = 1'-0"



RECEPTION - E



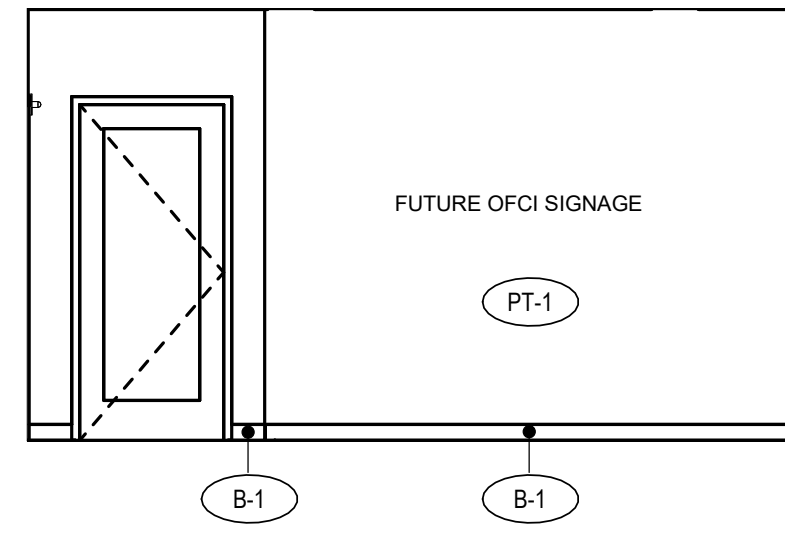
RECEPTION - S



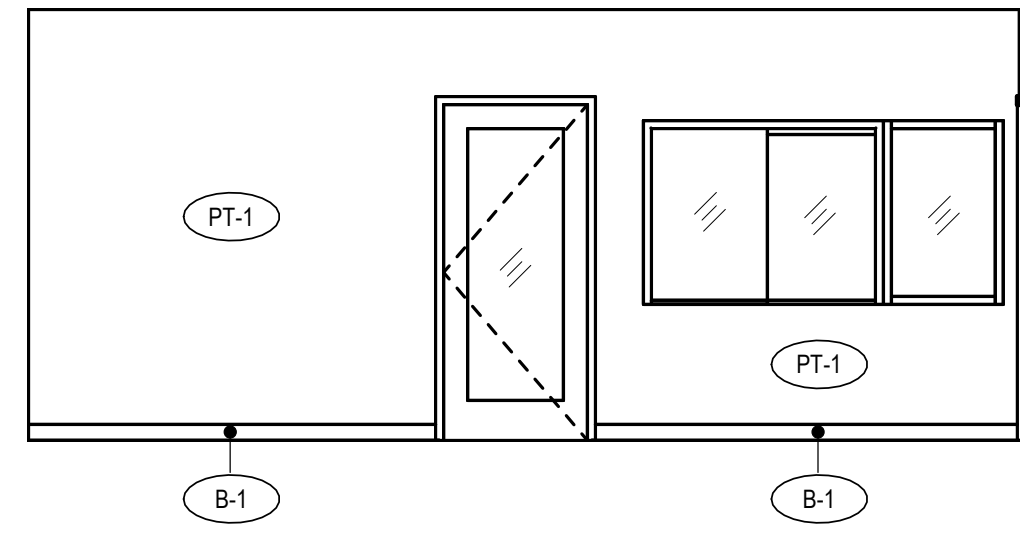
RECEPTION - W

GENERAL NOTES - INTERIOR ELEVATION

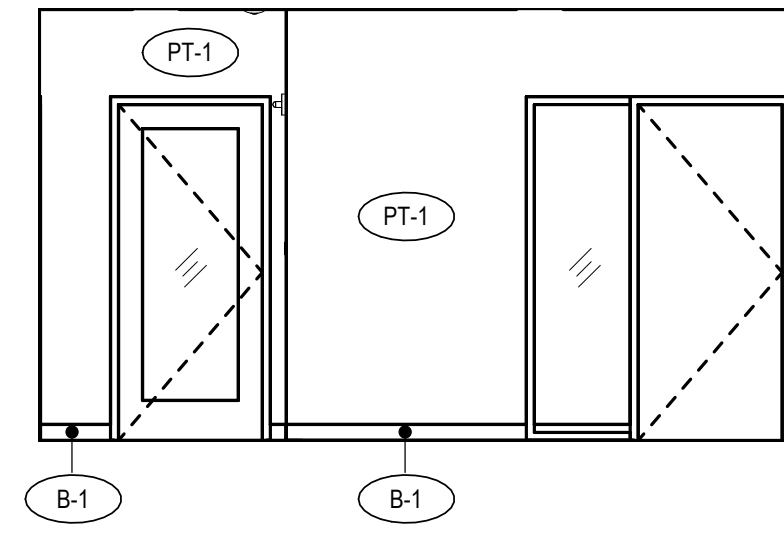
- A. SEE FINISH PLANS FOR CORNER GUARD LOCATIONS.
- B. INTERIOR ELEVATIONS ARE DRAWN IN TRUE DIMENSIONS, U.N.O. (I.E. ANGLED, CURVED)
- C. SEE PROJECT MANUAL, FINISH PLANS, REFLECTED CEILING PLANS, INTERIOR ELEVATIONS, AND INTERIOR FINISH LEGEND FOR ADDITIONAL FINISH INFORMATION
- D. SEE DOOR AND FRAME TYPES FOR ADDITIONAL FINISH INFORMATION AND REFERENCE TO DETAILS. DOOR SWINGS INDICATED BY DASHED LINES SHOWN ON ELEVATIONS ARE FOR REFERENCE ONLY.
- E. PROVIDE BLOCKING AND BACKING FOR ALL WALL-MOUNTED EQUIPMENT AND FIXTURES TO BE FURNISHED BY THE CONTRACTOR OR OWNER.
- F. SEE ALSO ELECTRICAL, MECHANICAL, PLUMBING, AND TECHNOLOGY DRAWINGS FOR ADDITIONAL WALL MOUNTED EQUIPMENT AND FIXTURES.



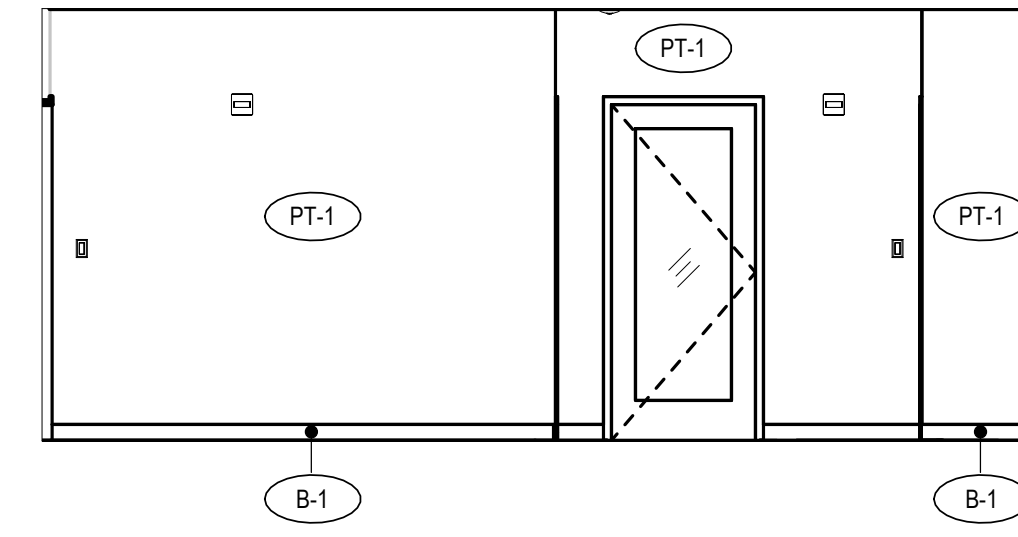
2 WAITING - N
1/4" = 1'-0"



WAITING - E



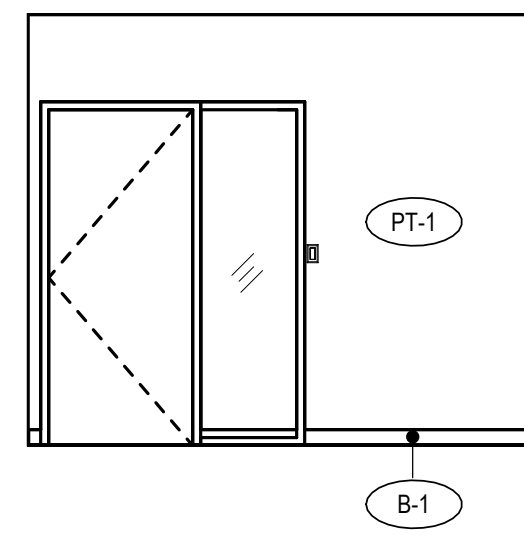
WAITING - S



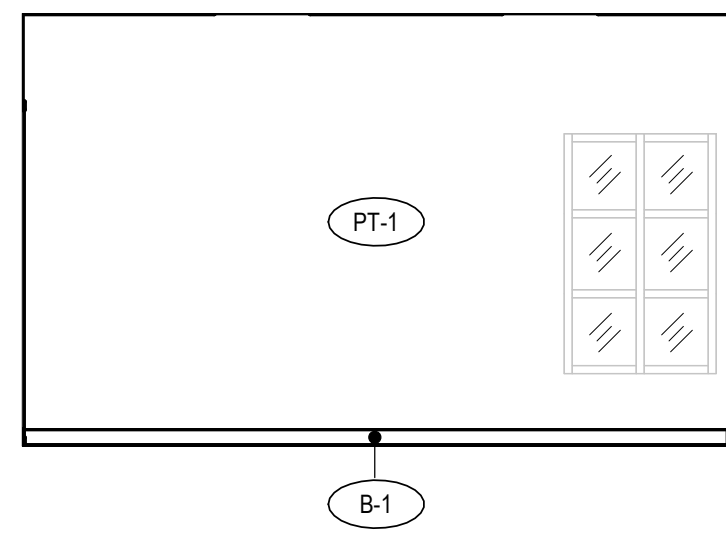
WAITING - W

FINISH TAG

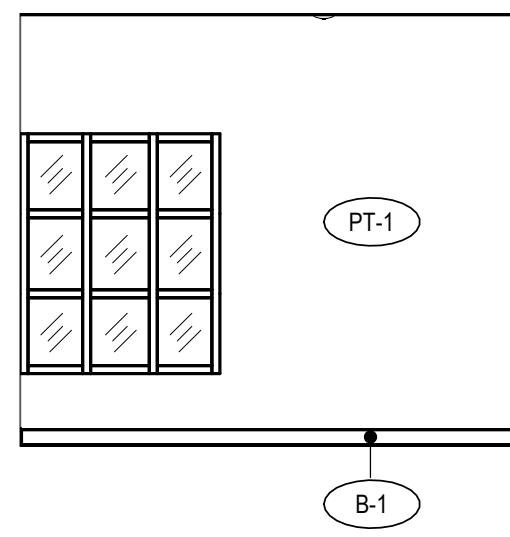
- | | | | |
|------|-------------------------------------|------|-----------------------------|
| B-1 | 4" RUBBER BASE | PT-3 | PAINT COLOR - TYPE 3 ACCENT |
| PL-1 | PLASTIC LAMINATE TYPE - 1 | PT-4 | PAINT COLOR - TYPE 4 ACCENT |
| PT-1 | PAINT COLOR - TYPE 1 WHITE | SS-1 | SOLID SURFACE TYPE - 1 |
| PT-2 | PAINT COLOR - TYPE 2 NEUTRAL ACCENT | | |



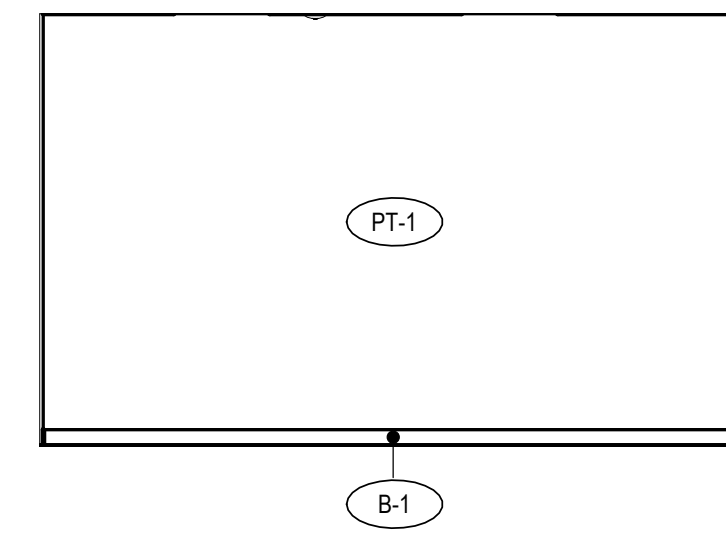
3 MAYOR'S OFFICE - N
1/4" = 1'-0"



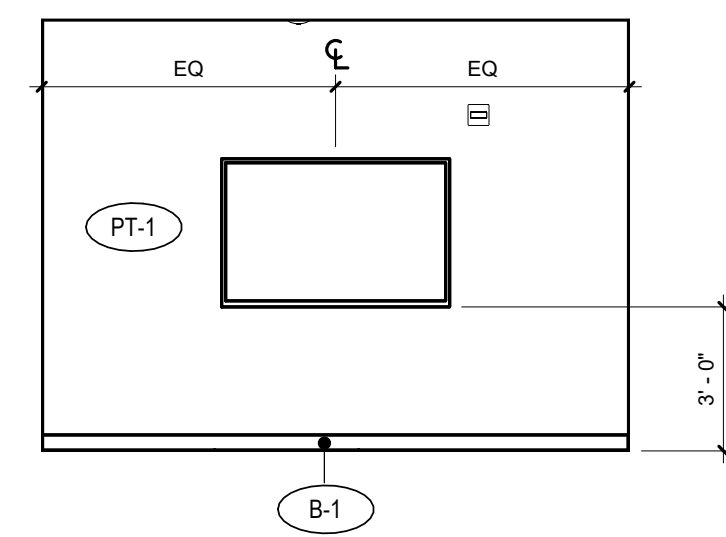
MAYOR'S OFFICE - E



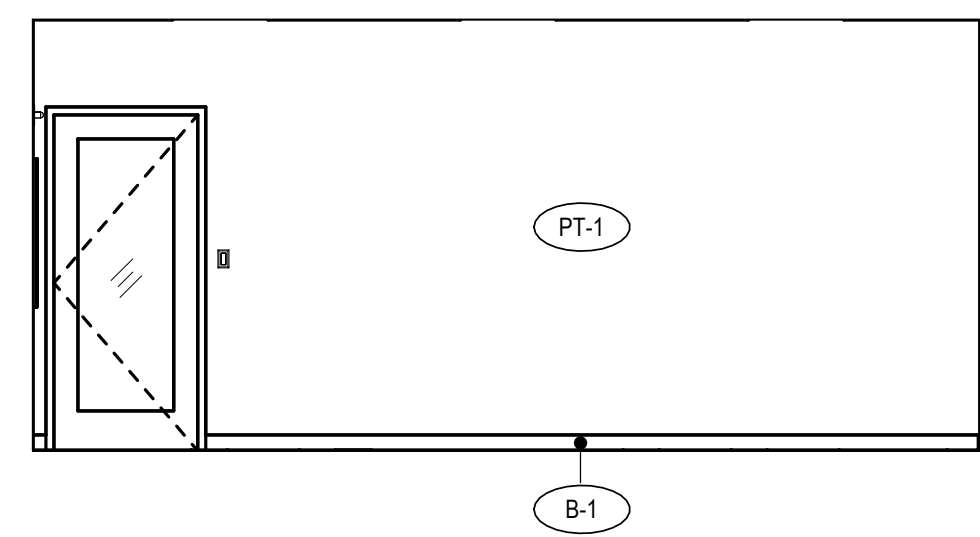
MAYOR'S OFFICE - S



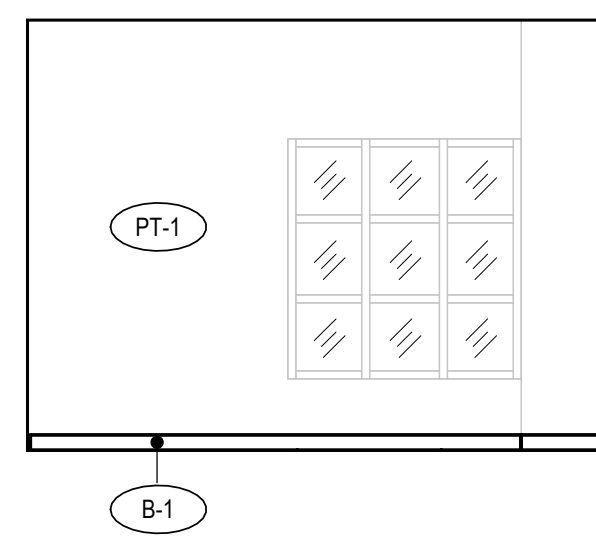
MAYOR'S OFFICE - W



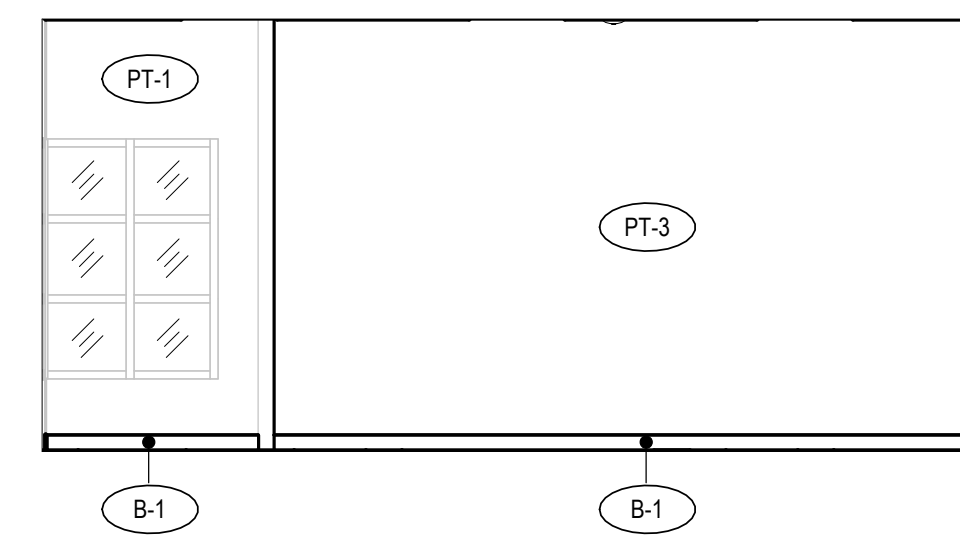
4 CONFERENCE - N
1/4" = 1'-0"



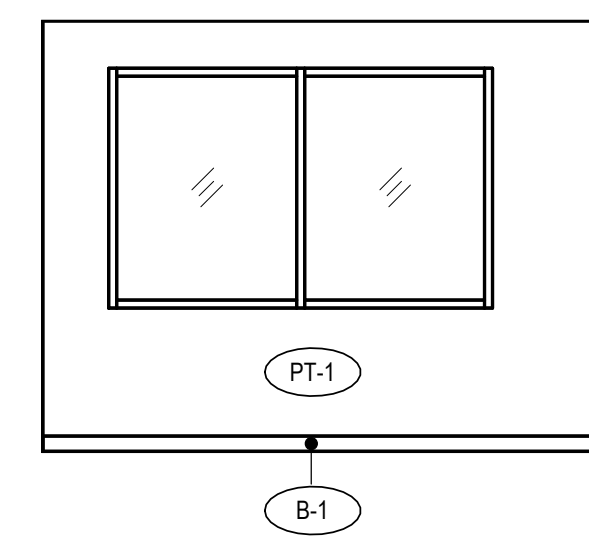
CONFERENCE - E



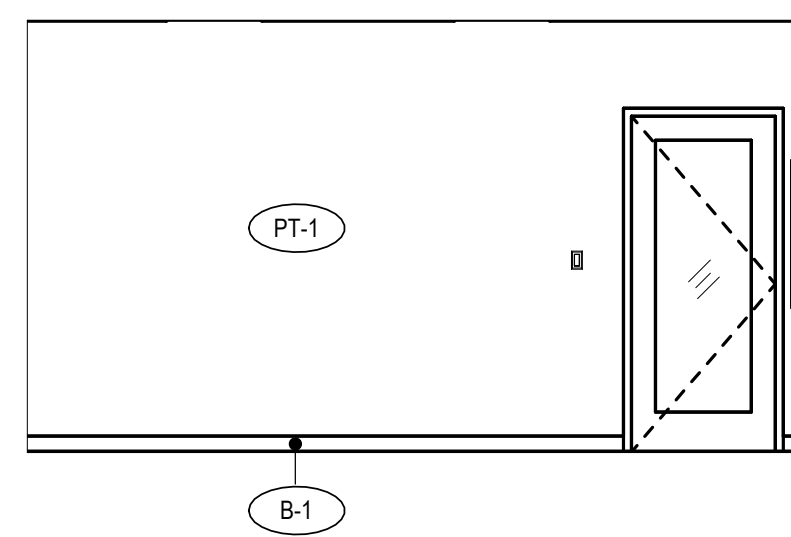
CONFERENCE - S



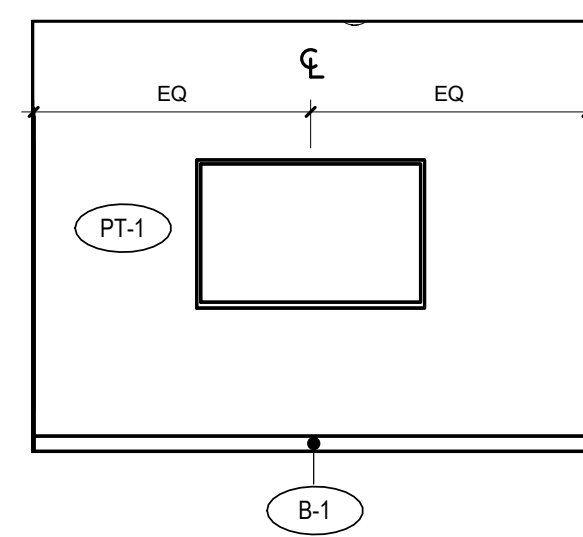
CONFERENCE - W



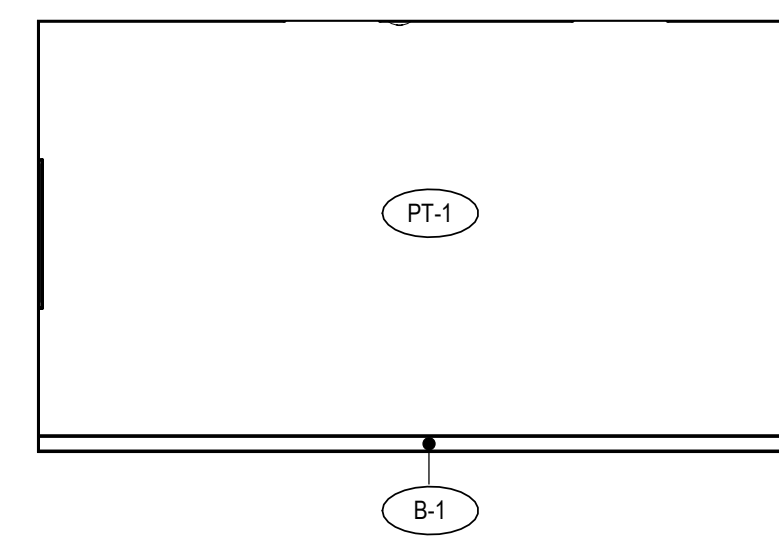
5 CMO OFFICE - N
1/4" = 1'-0"



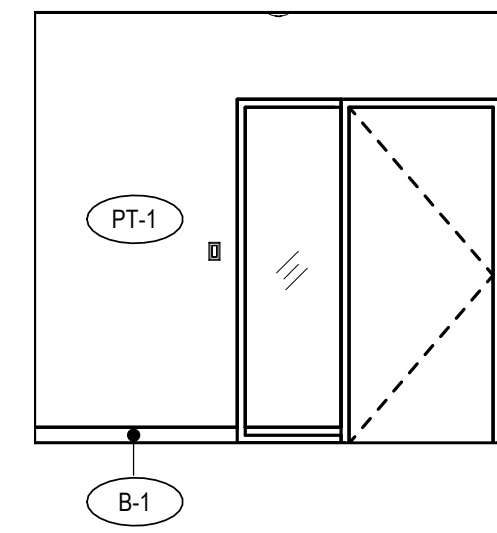
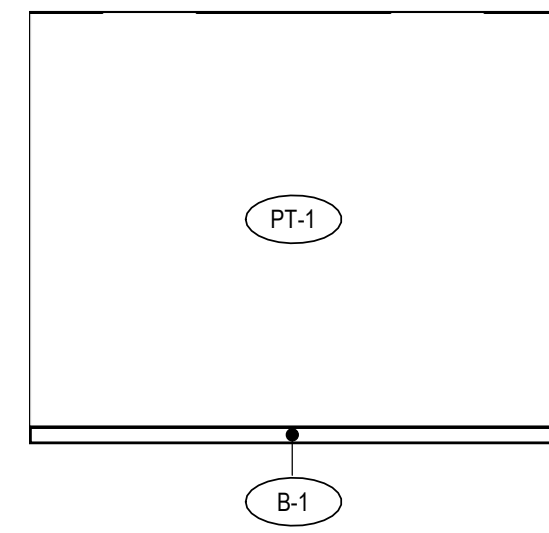
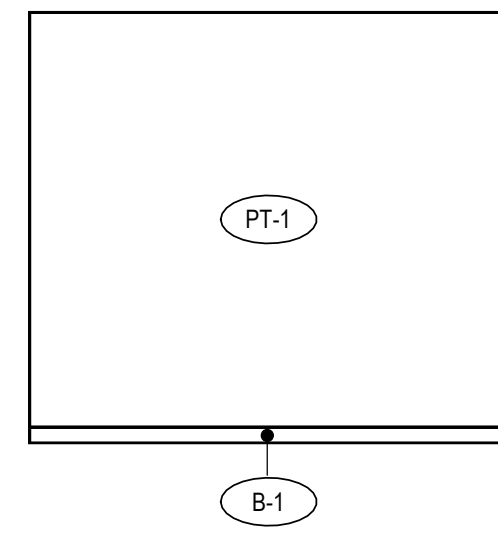
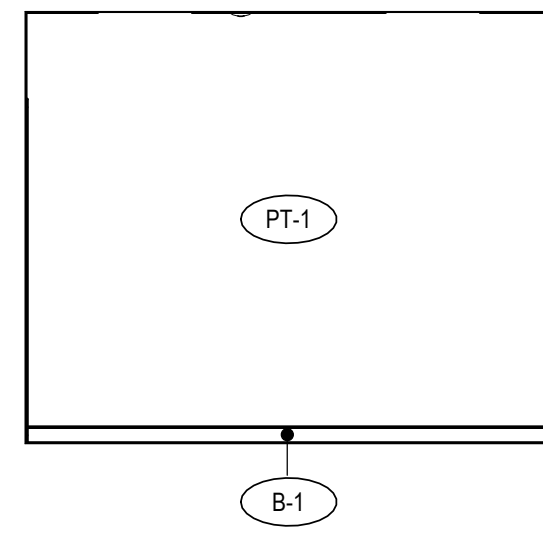
CMO OFFICE - E



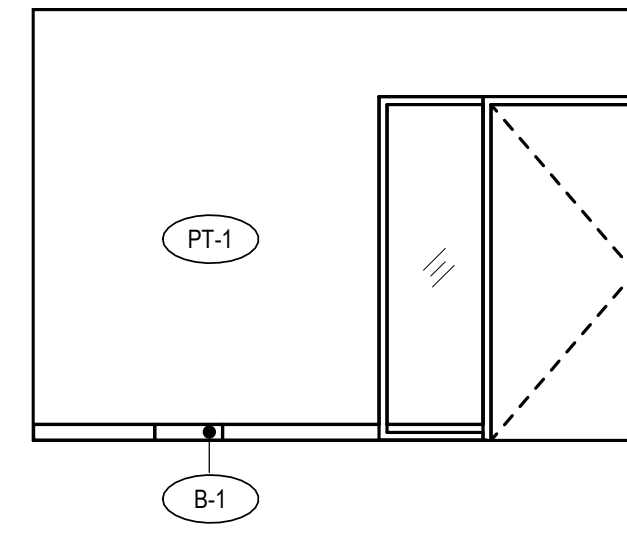
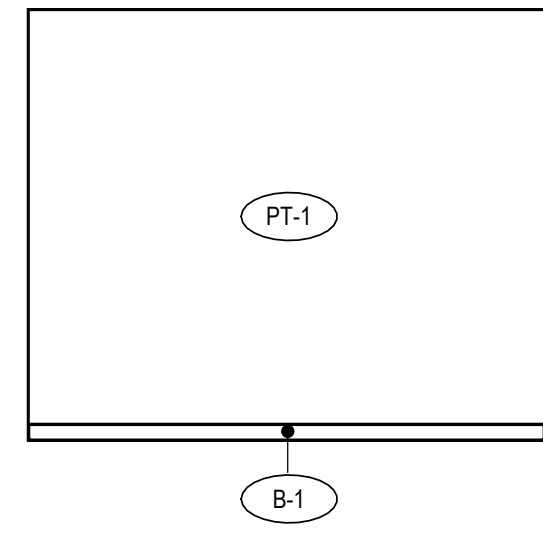
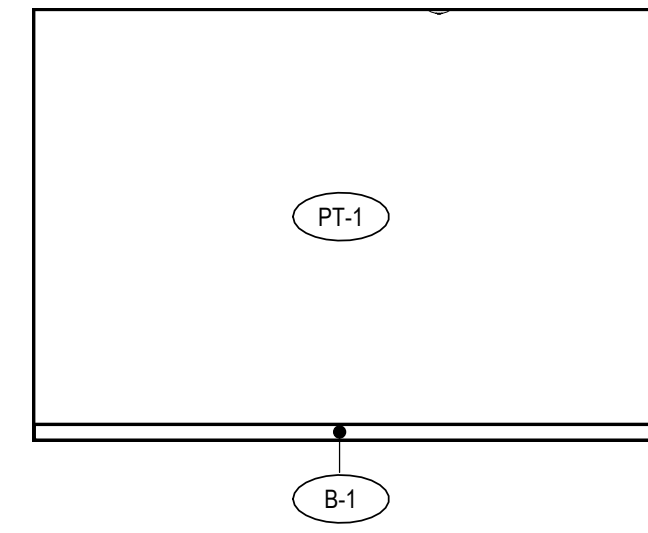
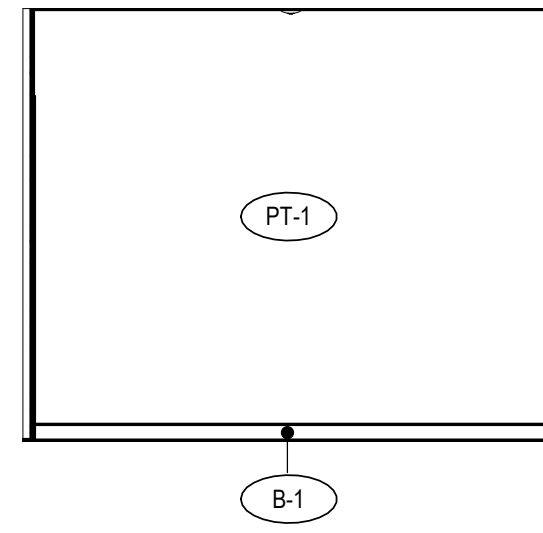
CMO OFFICE - S



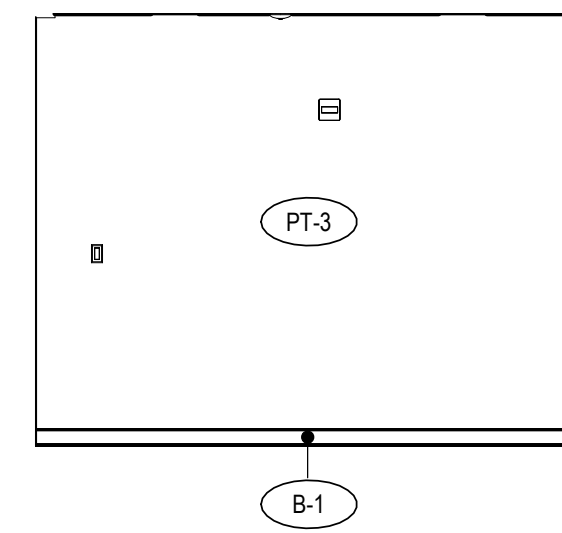
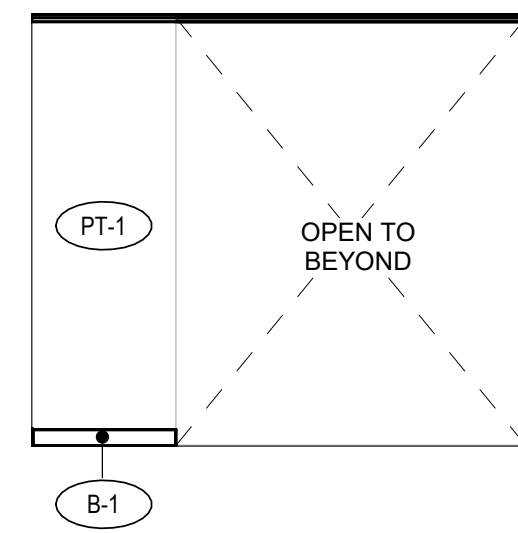
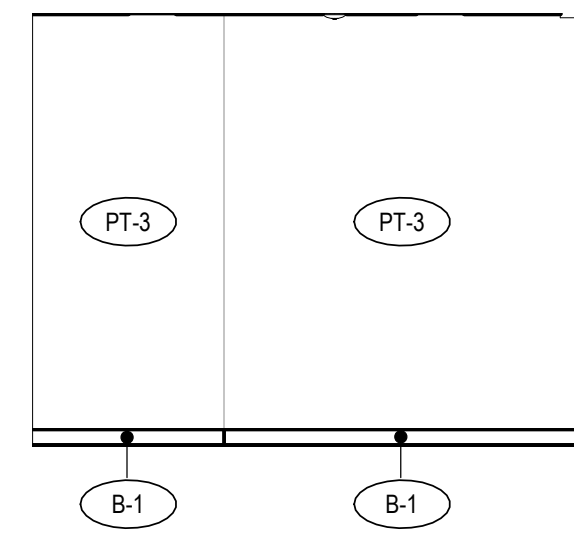
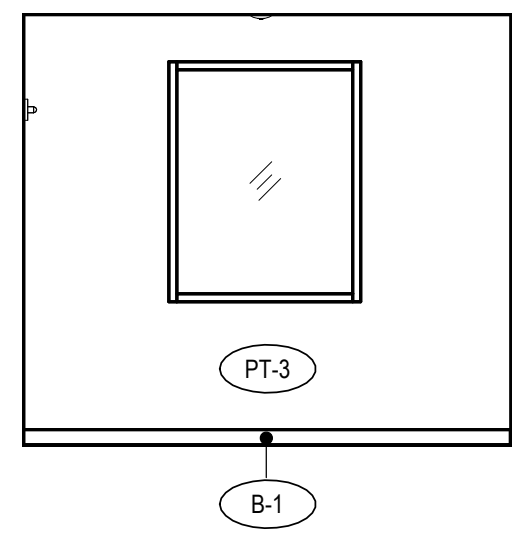
CMO OFFICE - W



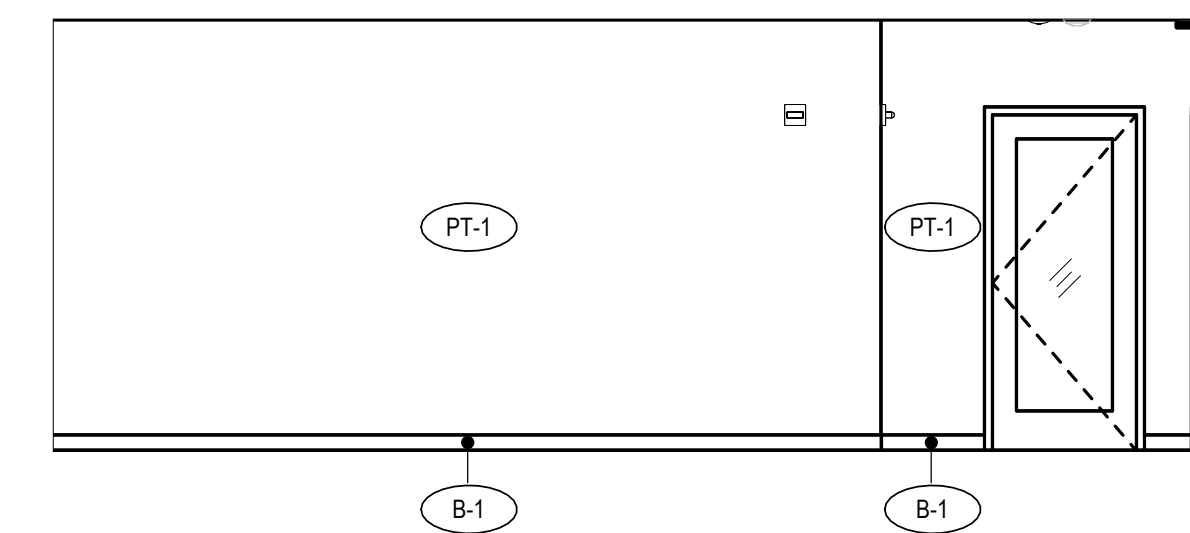
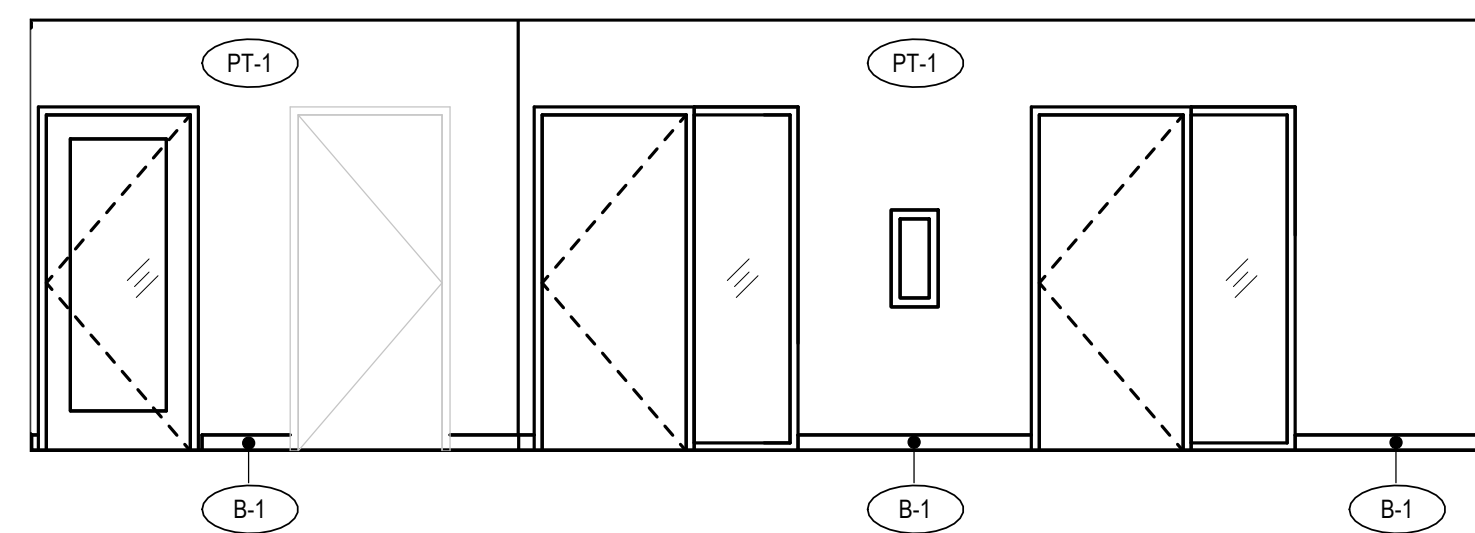
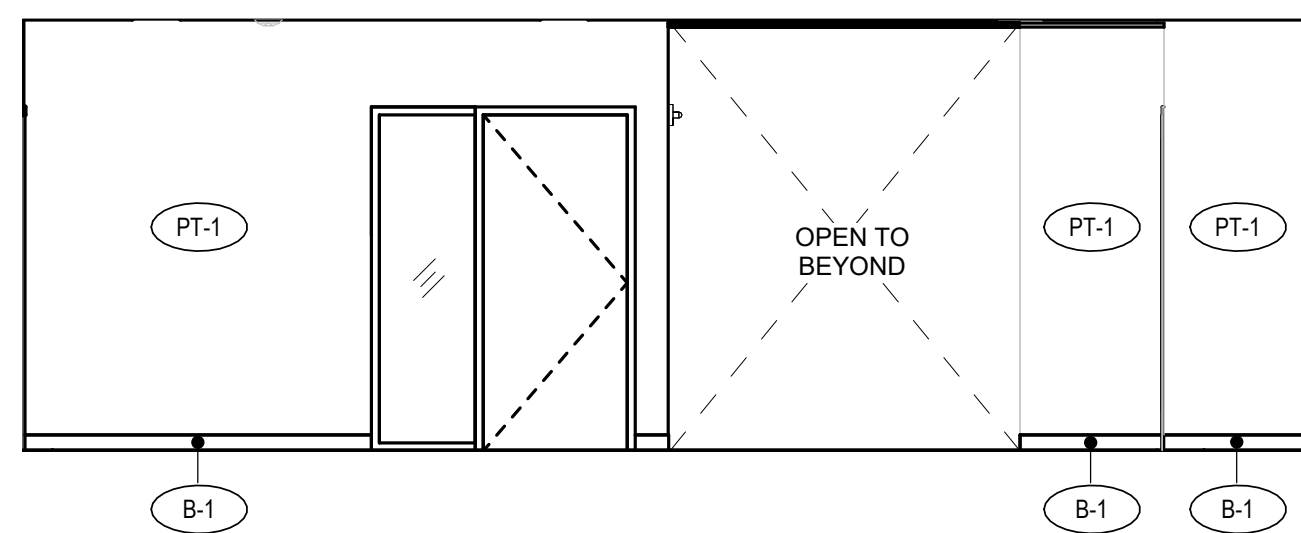
1 10 X 12 OFFICE TYP - N 10 X 12 OFFICE TYP - E 10 X 12 OFFICE TYP - S 10 X 12 OFFICE TYP - W
1/4" = 1'-0"



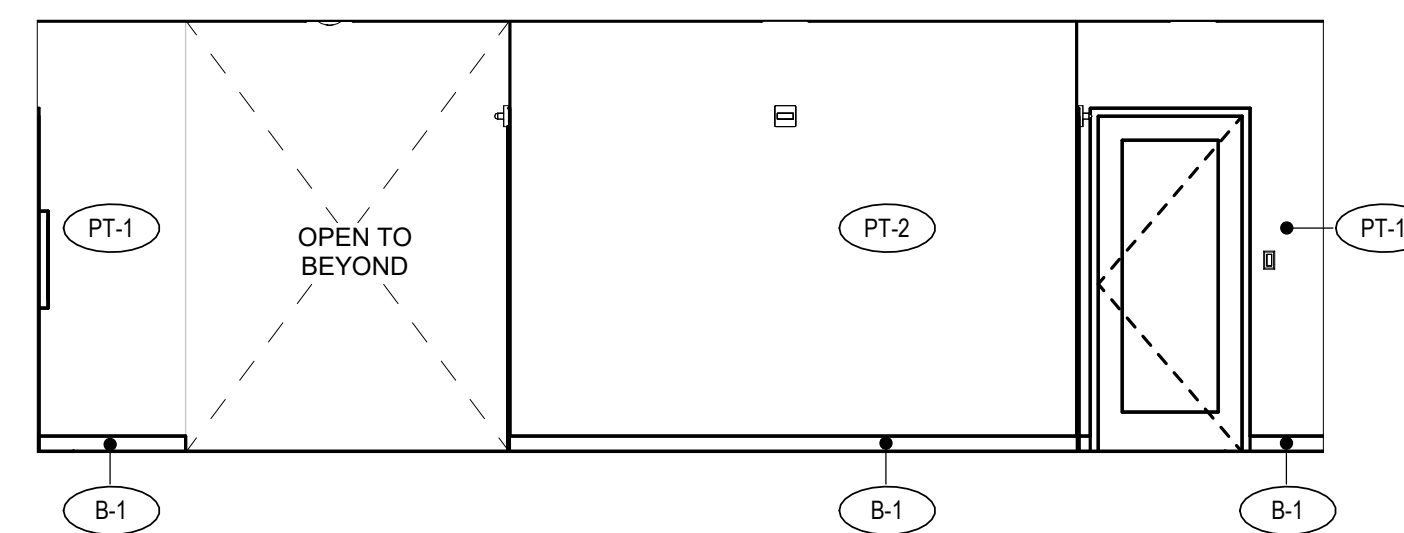
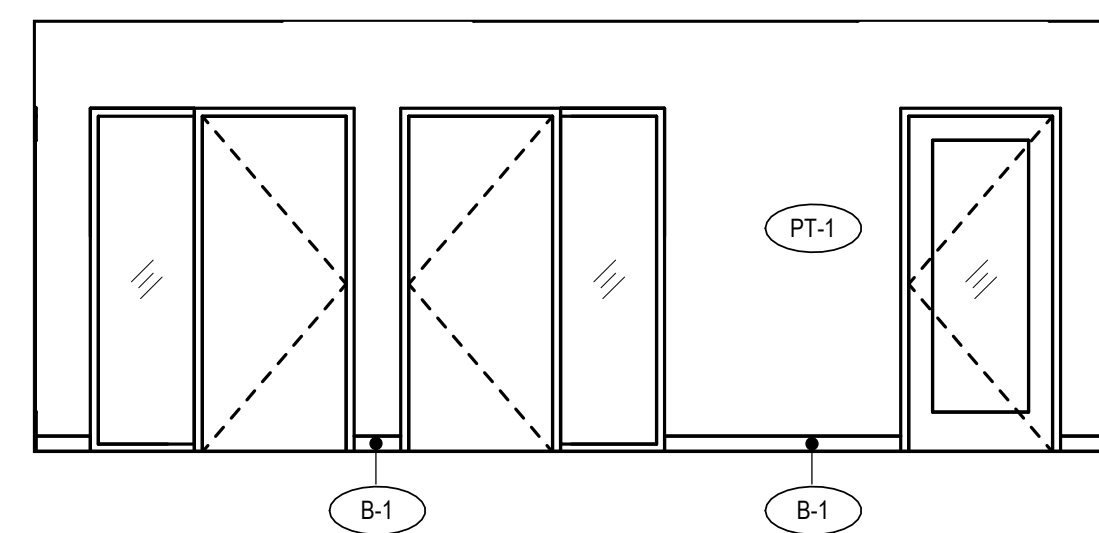
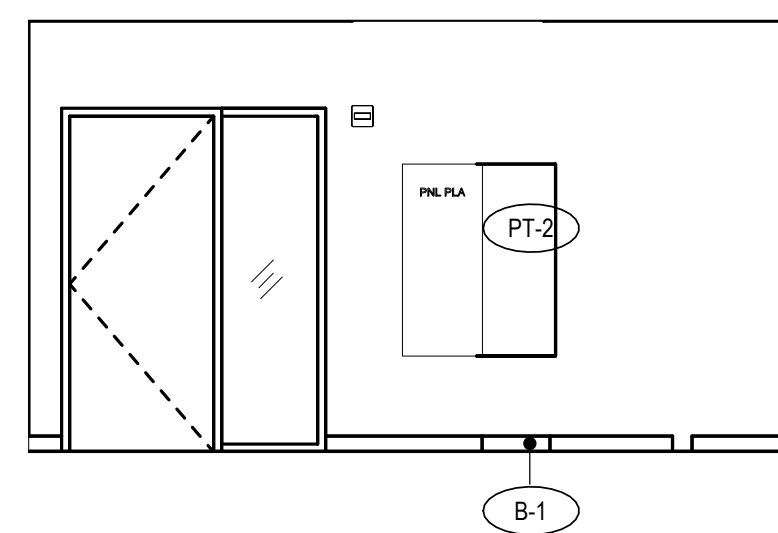
2 13 X 11 OFFICE TYP - N 13 X 11 OFFICE TYP - E 13 X 11 OFFICE TYP - S 13 X 11 OFFICE TYP - W
1/4" = 1'-0"



3 COLLAB - N COLLAB - E COLLAB - S COLLAB - W
1/4" = 1'-0"



4 CIRCULATION - N CIRCULATION - 1E CIRCULATION - 1W
1/4" = 1'-0"



CIRCULATION - 2E CIRCULATION - 2W CIRCULATION - S

GENERAL NOTES - INTERIOR ELEVATION

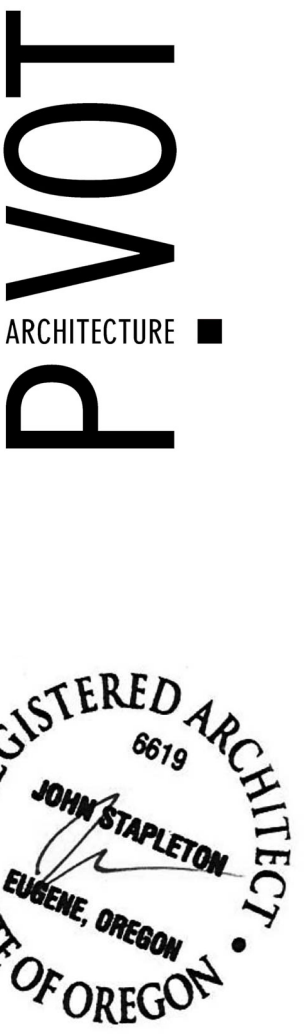
- A. SEE FINISH PLANS FOR CORNER GUARD LOCATIONS.
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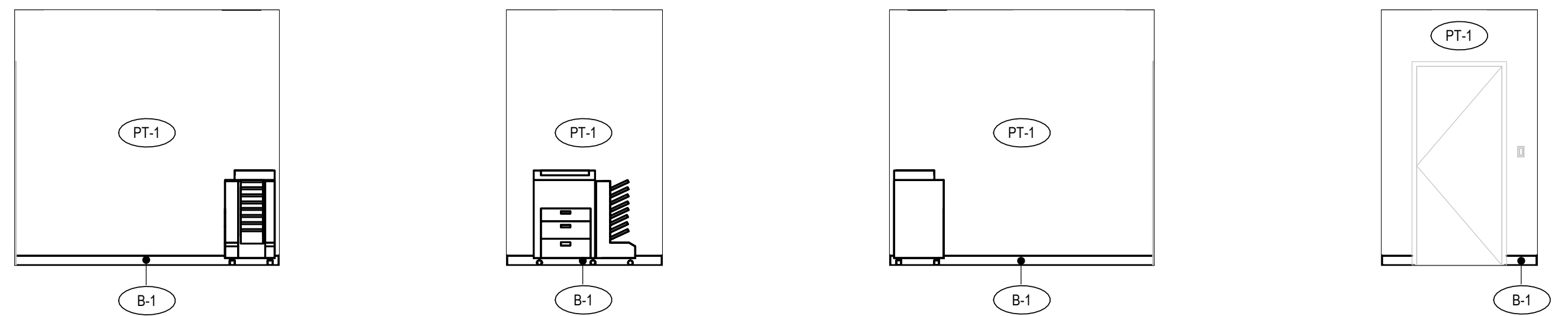
KEYNOTES - SPECIFICATION

KEYNOTES

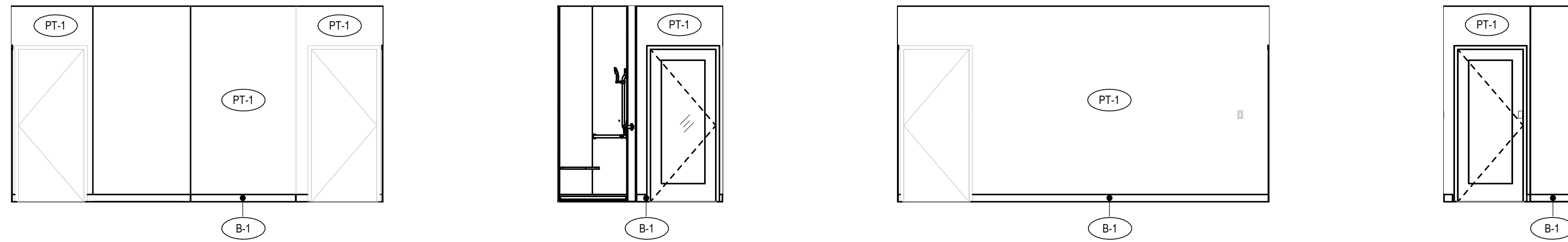
FINISH TAG

- B-1 4" RUBBER BASE
- PT-3 PAINT COLOR - TYPE 3 ACCENT
- PL-1 PLASTIC LAMINATE TYPE - 1
- PT-4 PAINT COLOR - TYPE 4 ACCENT
- PT-1 PAINT COLOR - TYPE 1 WHITE
- SS-1 SOLID SURFACE TYPE - 1
- PT-2 PAINT COLOR - TYPE 2 NEUTRAL ACCENT

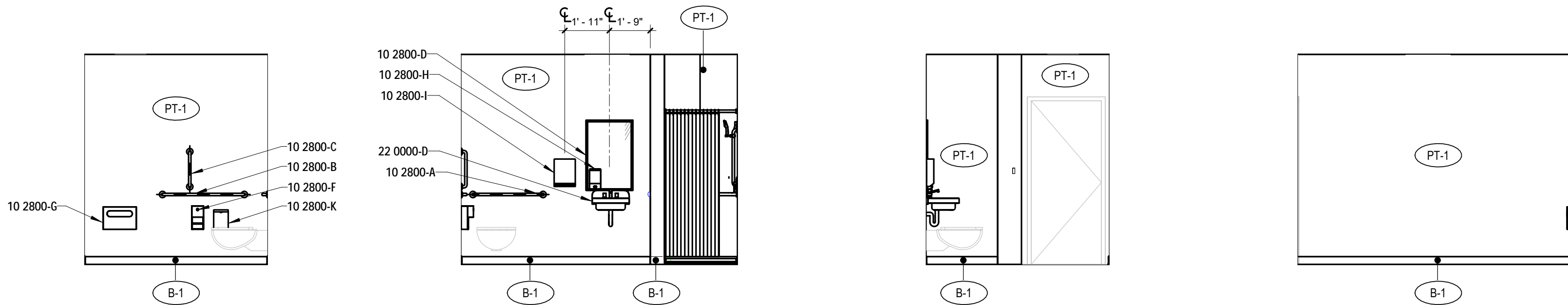




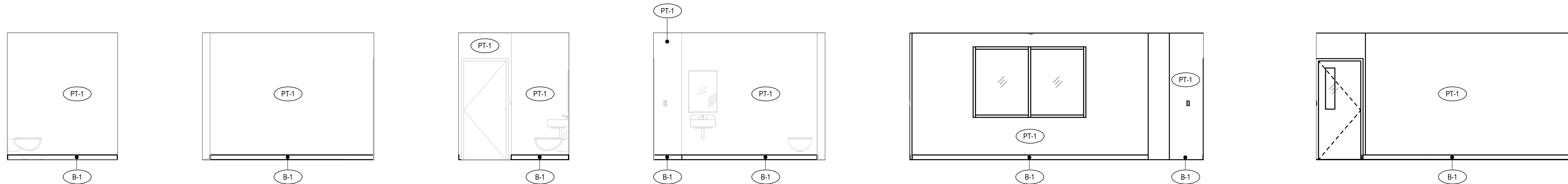
1 COPY - N 1/4" = 1'-0"
COPY - E **COPY - S** **COPY - W**



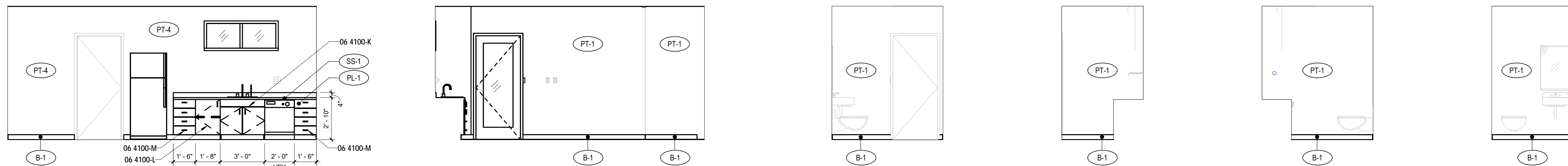
2 HALL - N 1/4" = 1'-0"
HALL - E **HALL - S** **HALL - W**



3 508 RR - N 1/4" = 1'-0"
508 RR - E **508 RR - S** **508 RR - W**



4 509 RR - N 1/4" = 1'-0"
509 RR - E **509 RR - S** **509 RR - W** **5 BREAKROOM - N** 1/4" = 1'-0"
BREAKROOM - E



BREAKROOM - S **BREAKROOM - W** **6 510 RR - N** 1/4" = 1'-0"
510 RR - E **510 RR - S** **510 RR - W**

GENERAL NOTES - INTERIOR ELEVATION

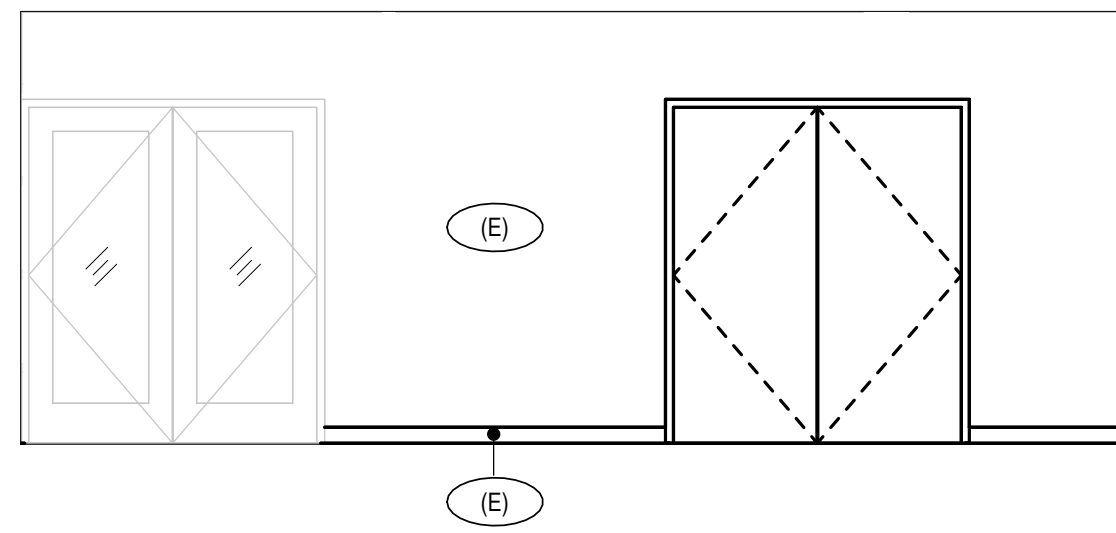
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- B. INTERIOR ELEVATIONS ARE DRAWN IN TRUE DIMENSIONS, U.N.O. (I.E. ANGLED, CURVED)
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KEYNOTES - SPECIFICATION

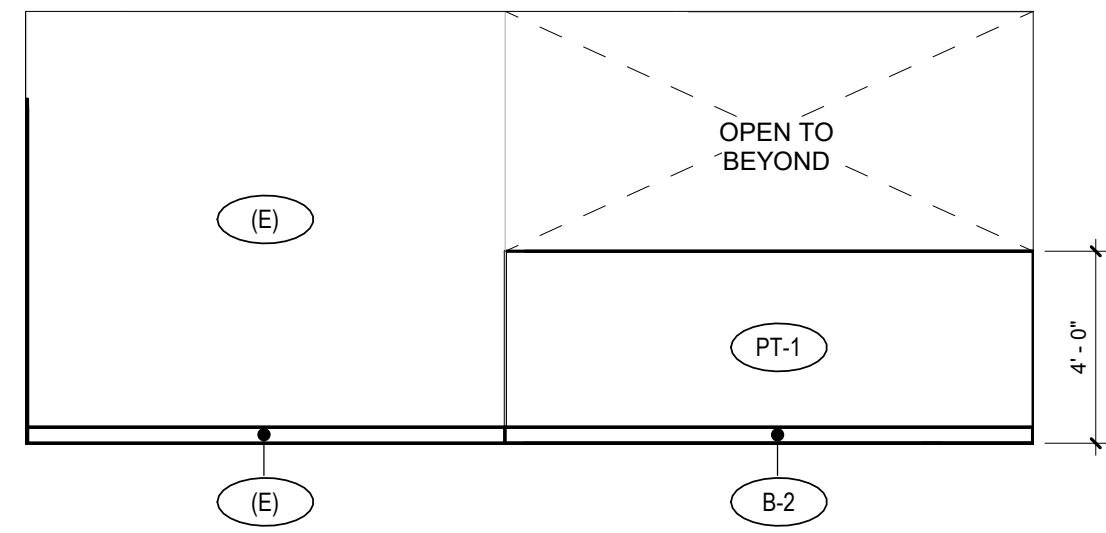
- 06 4100-K 23" D SINK BASE CABINET WITH FRONT APRON AND DOORS
- 06 4100-L 23" D BASE CABINET WITH DOORS AND ADJUSTABLE SHELF
- 06 4100-M 23" D BASE CABINET WITH (4) EQUAL DRAWERS
- 10 2800-A GRAB BAR (GB-1)
- 10 2800-B GRAB BAR (GB-2)
- 10 2800-C GRAB BAR (GB-3)
- 10 2800-D FRAMED MIRROR - 24" X 36"
- 10 2800-F TOILET PAPER DISPENSER
- 10 2800-G SEAT COVER DISPENSER
- 10 2800-H SOAP DISPENSER
- 10 2800-I PAPER TOWEL DISPENSER
- 10 2800-K SANITARY NAPKIN DISPOSAL
- 22 0000-D SINK, SEE PLUMBING

FINISH TAG

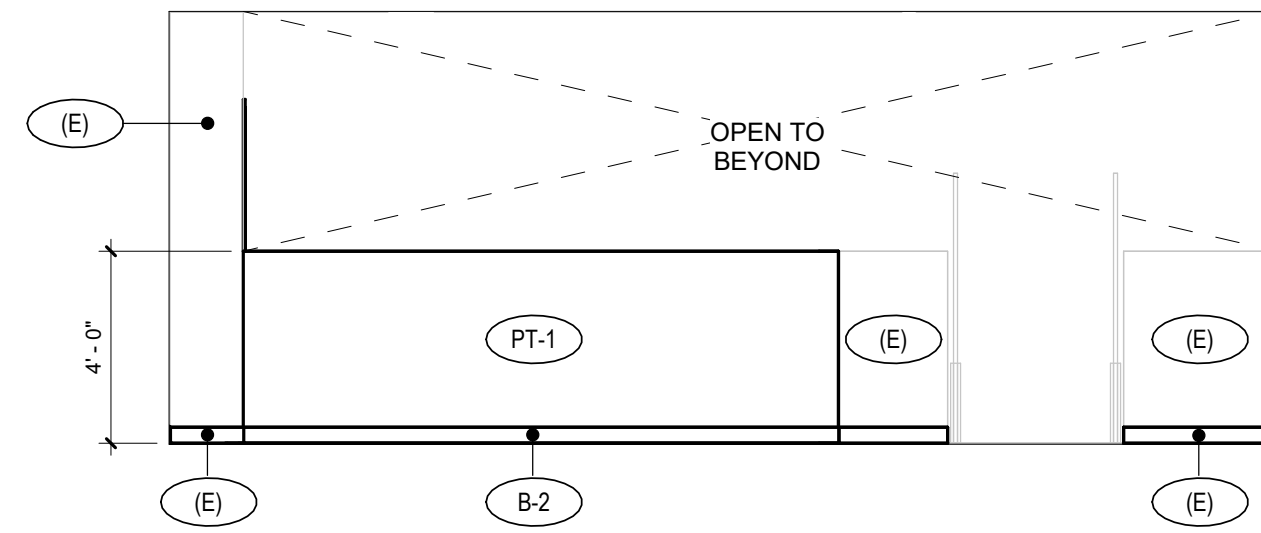
- (B-1) 4" RUBBER BASE
- (PT-3) PAINT COLOR - TYPE 3 ACCENT
- (PL-1) PLASTIC LAMINATE TYPE - 1
- (PT-4) PAINT COLOR - TYPE 4 ACCENT
- (PT-1) PAINT COLOR - TYPE 1 WHITE
- (SS-1) SOLID SURFACE TYPE - 1
- (PT-2) PAINT COLOR - TYPE 2 NEUTRAL ACCENT



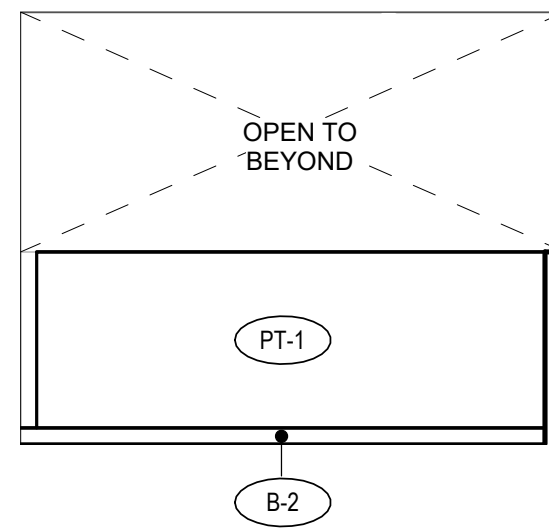
1 ENTRY - E
1/4" = 1'-0"



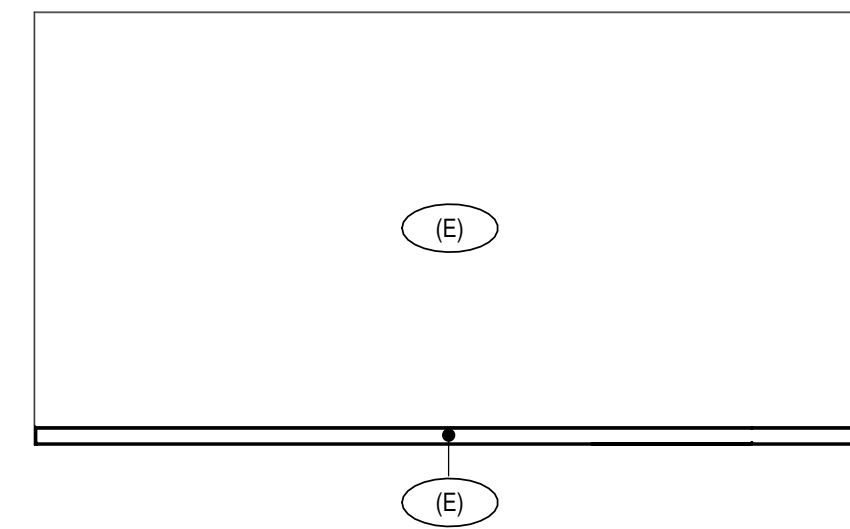
ENTRY - S



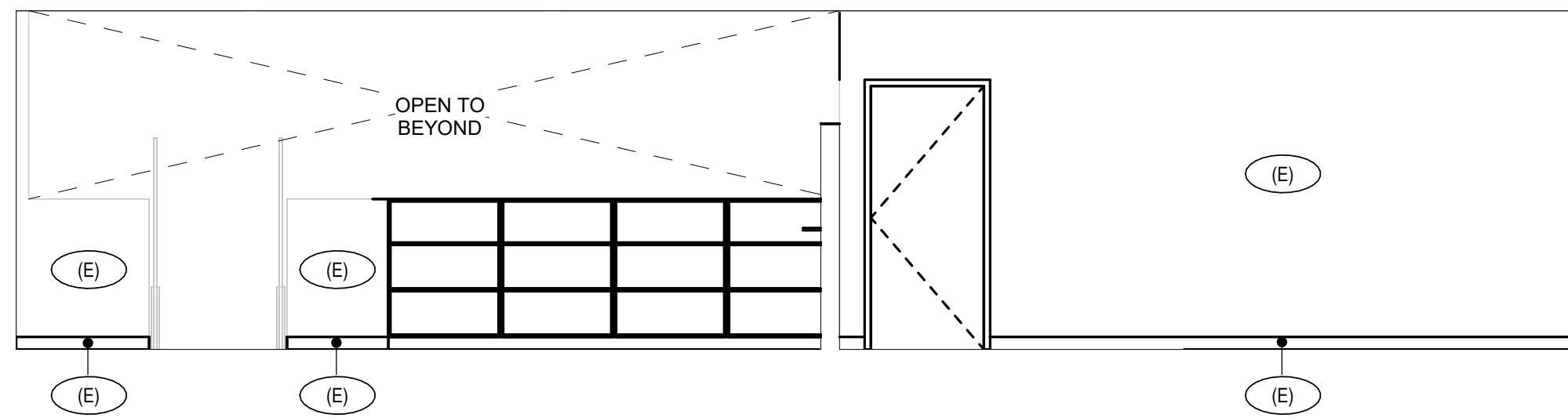
ENTRY - W



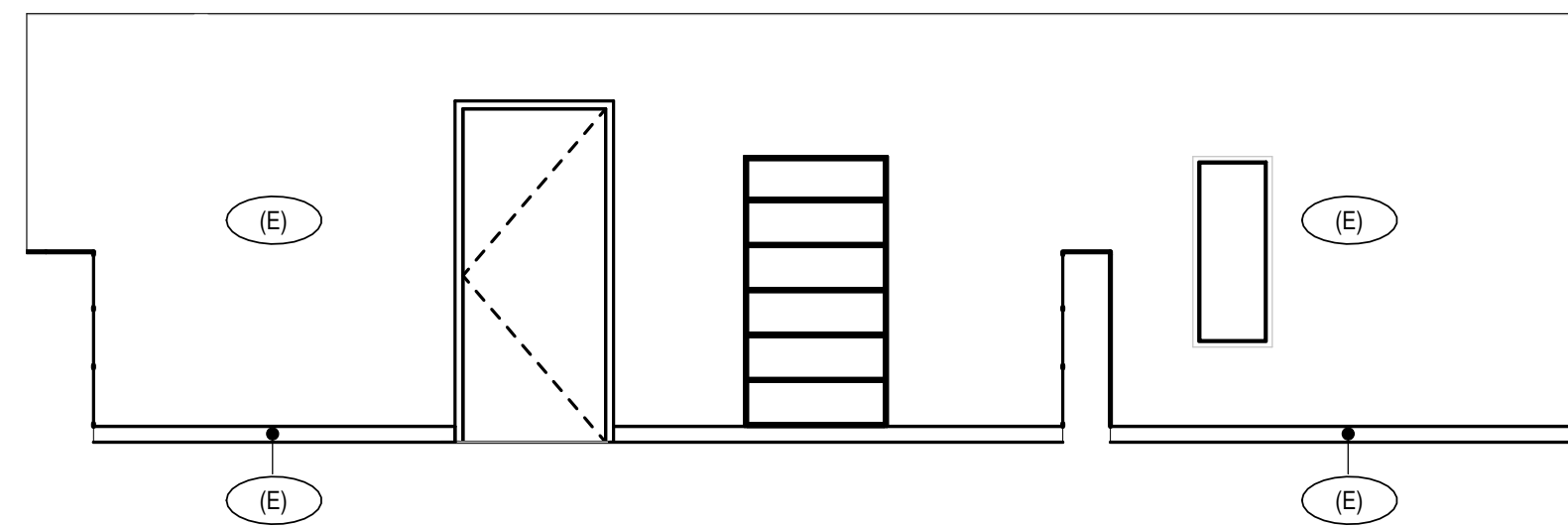
2 FRIENDS BOOKSTORE - N
1/4" = 1'-0"



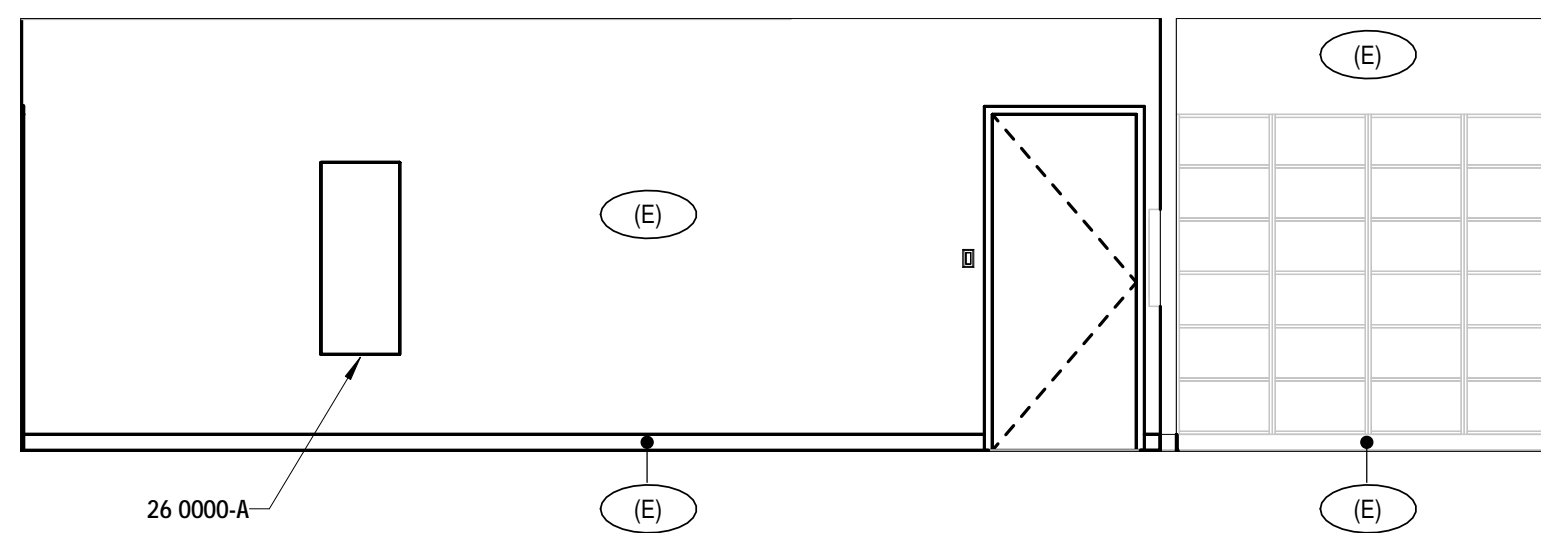
3 FRIENDS - E
1/4" = 1'-0"



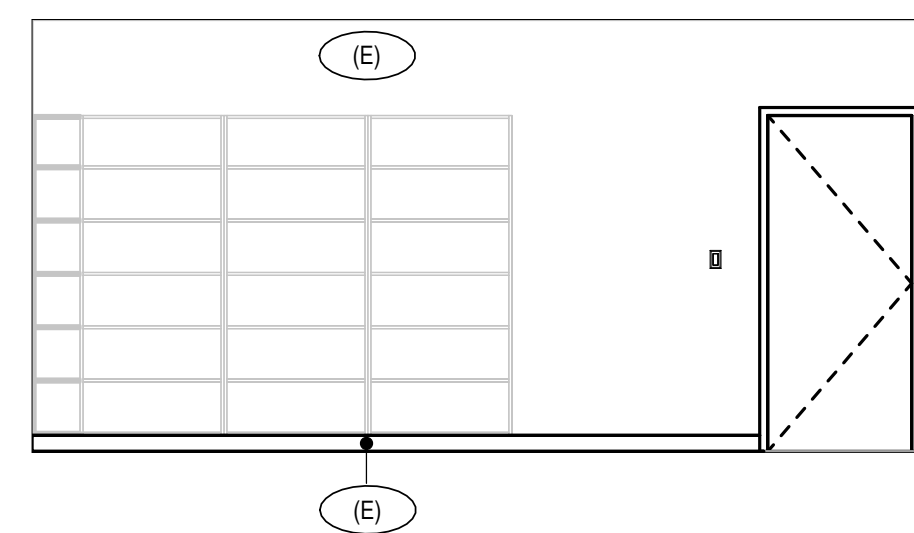
4 LIBRARY DISPLAY - E
1/4" = 1'-0"



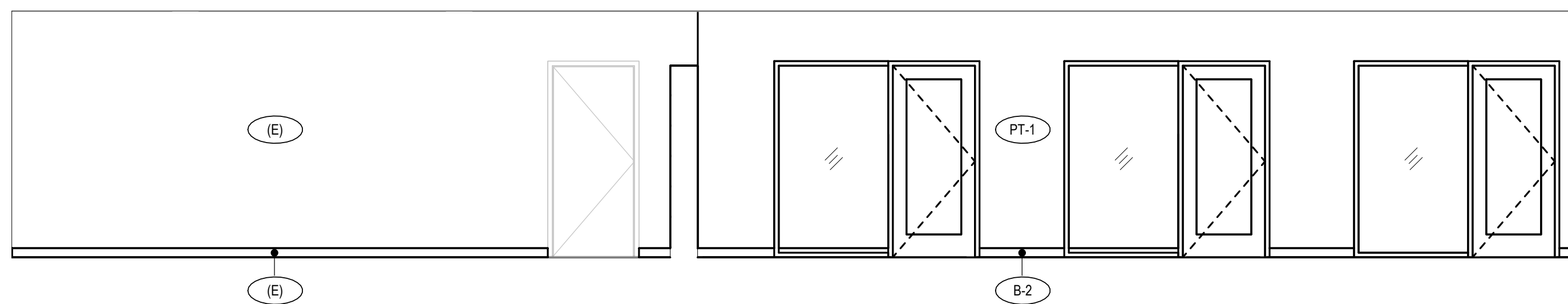
LIBRARY DISPLAY - S



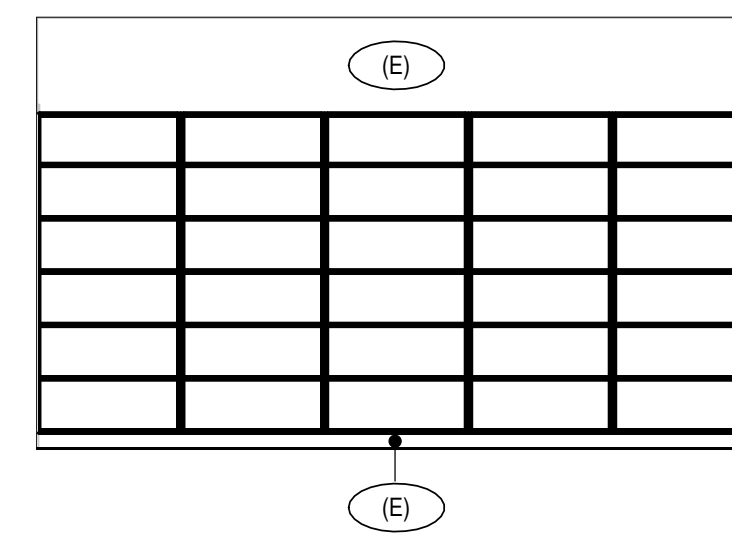
5 DELIVERIES - N
1/4" = 1'-0"



DELIVERIES - W



6 ADULT LIBRARY - E
1/4" = 1'-0"



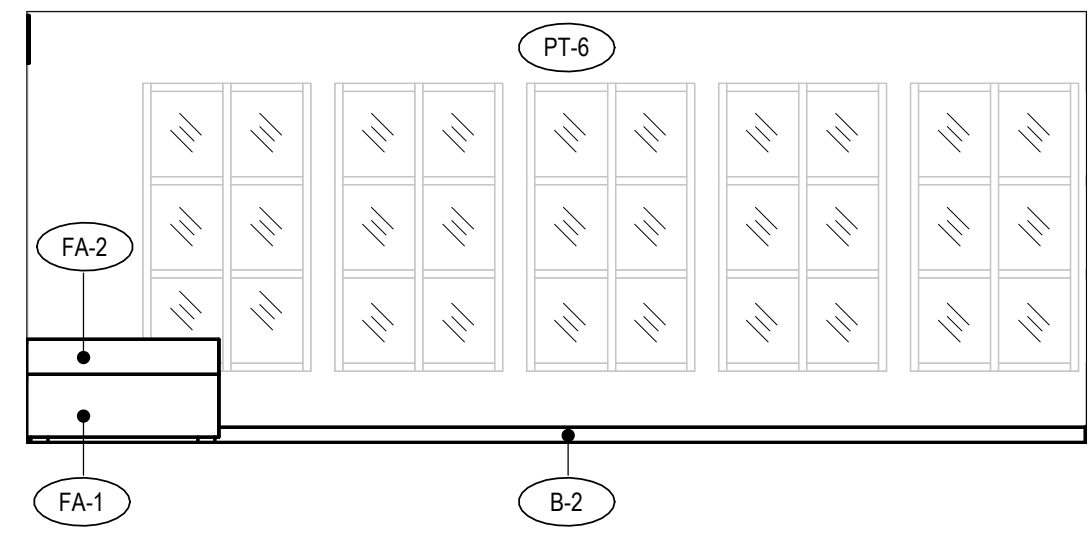
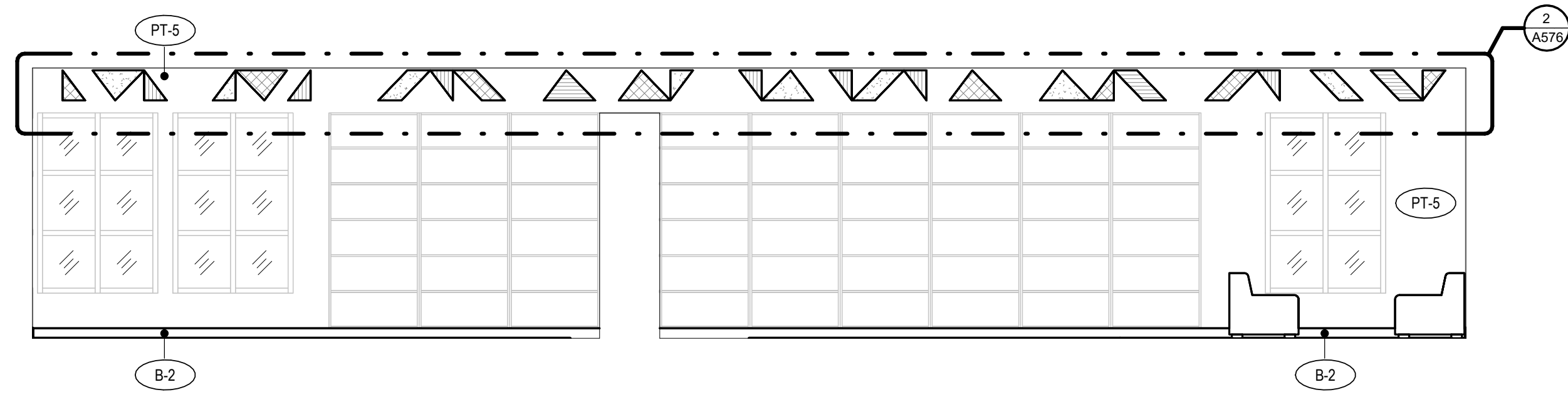
7 COMPUTER - S
1/4" = 1'-0"

GENERAL NOTES - INTERIOR ELEVATION

- A. SEE FINISH PLANS FOR CORNER GUARD LOCATIONS.
- B. INTERIOR ELEVATIONS ARE DRAWN IN TRUE DIMENSIONS, U.N.O. (I.E. ANGLED, CURVED)
- C. SEE PROJECT MANUAL, FINISH PLANS, REFLECTED CEILING PLANS, INTERIOR ELEVATIONS, AND INTERIOR FINISH LEGEND FOR ADDITIONAL FINISH INFORMATION
- D. SEE DOOR AND FRAME TYPES FOR ADDITIONAL FINISH INFORMATION AND REFERENCE TO DETAILS. DOOR SWINGS INDICATED BY DASHED LINES SHOWN ON ELEVATIONS ARE FOR REFERENCE ONLY.
- E. PROVIDE BLOCKING AND BACKING FOR ALL WALL-MOUNTED EQUIPMENT AND FIXTURES TO BE FURNISHED BY THE CONTRACTOR OR OWNER.
- F. SEE ALSO ELECTRICAL, MECHANICAL, PLUMBING, AND TECHNOLOGY DRAWINGS FOR ADDITIONAL WALL MOUNTED EQUIPMENT AND FIXTURES.

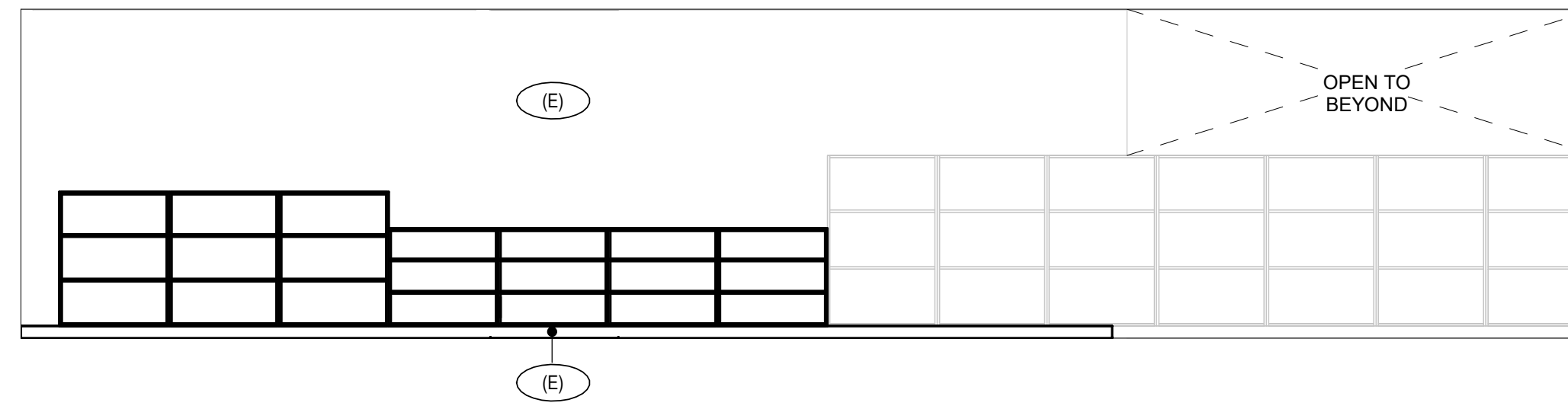
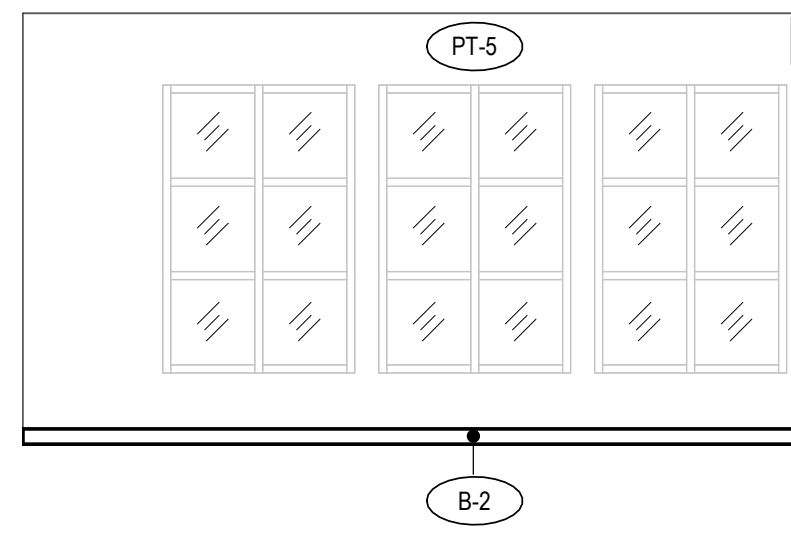
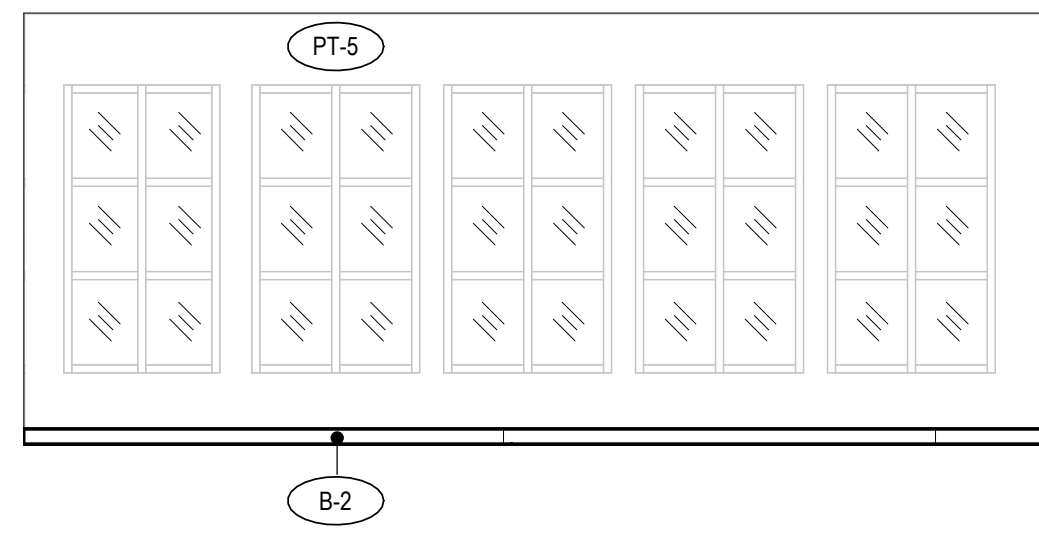
FINISH TAG

(B-2)	4" RUBBER BASE	(PT-6)	PAINT COLOR - TYPE 6 ACCENT
(FA-1)	UPHOLSTERY FABRIC - TYPE 1	(PT-7)	PAINT COLOR - TYPE 7 ACCENT
(FA-2)	UPHOLSTERY FABRIC - TYPE 2	(PT-8)	PAINT COLOR - TYPE 8 ACCENT
(FA-3)	UPHOLSTERY FABRIC - TYPE 3	(SS-2)	SOLID SURFACE TYPE - 2
(PL-2)	PLASTIC LAMINATE TYPE - 2	(SS-3)	SOLID SURFACE TYPE - 3
(PT-1)	PAINT COLOR - TYPE 1 WHITE	(WD-1)	WOOD CEILING PANELS TYPE - 1
(PT-5)	PAINT COLOR - TYPE 5 WHITE	(WP-1)	WOOD WALL PANEL TYPE - 1



1 TEEN AREA - N
1/4" = 1'-0"

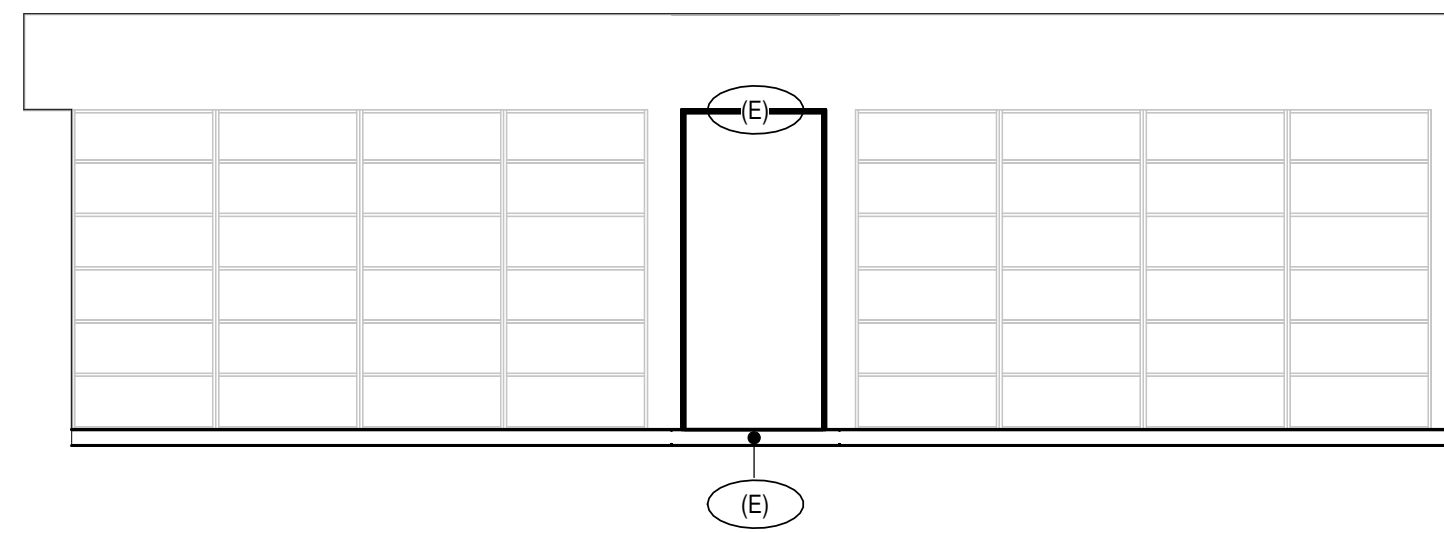
TEEN AREA - E



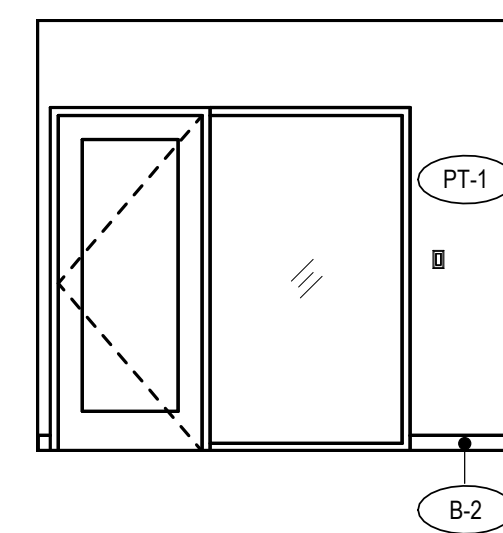
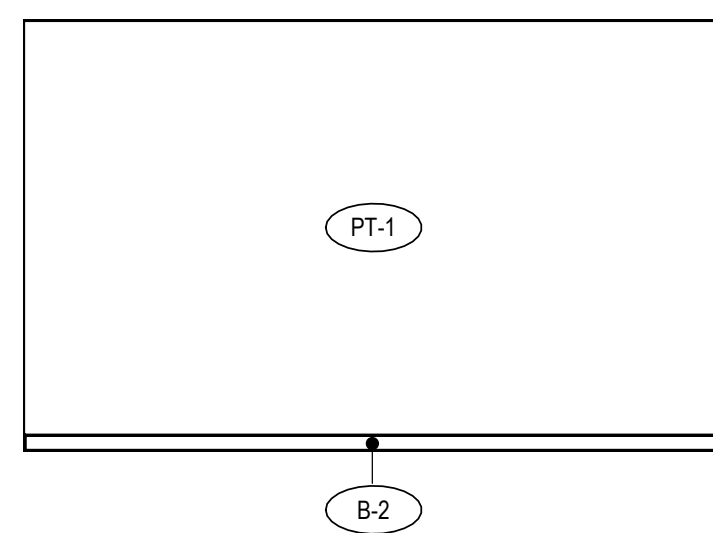
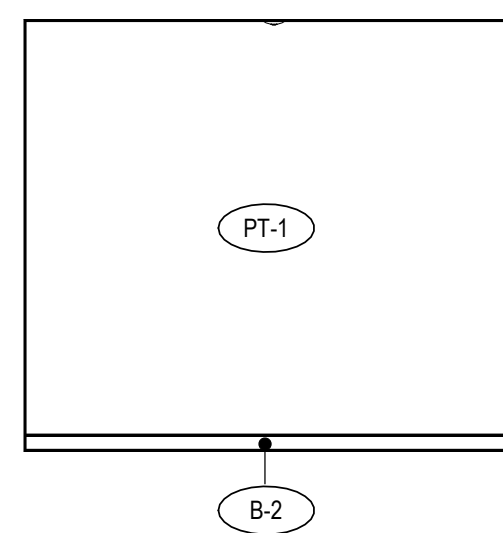
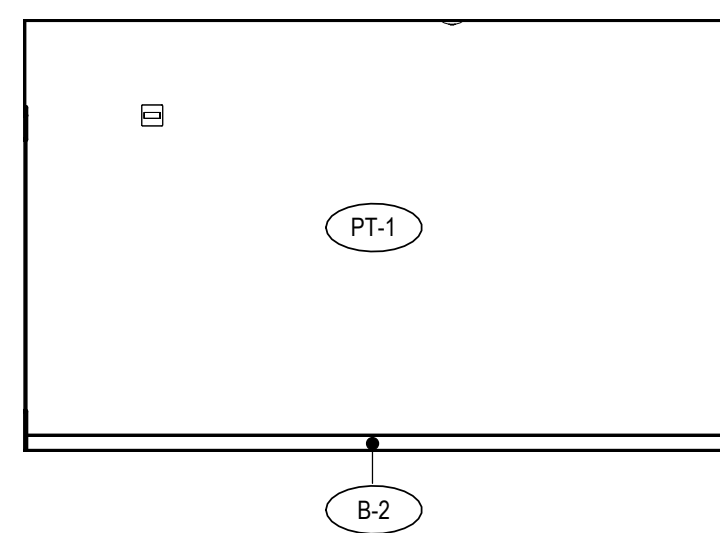
TEEN AREA - S

TEEN AREA - W

2 K&T AREA - S
1/4" = 1'-0"



3 AV LIBRARY - N
1/4" = 1'-0"



4 MEETING ROOM TYP - N
1/4" = 1'-0"

MEETING ROOM TYP - E

MEETING ROOM TYP - S

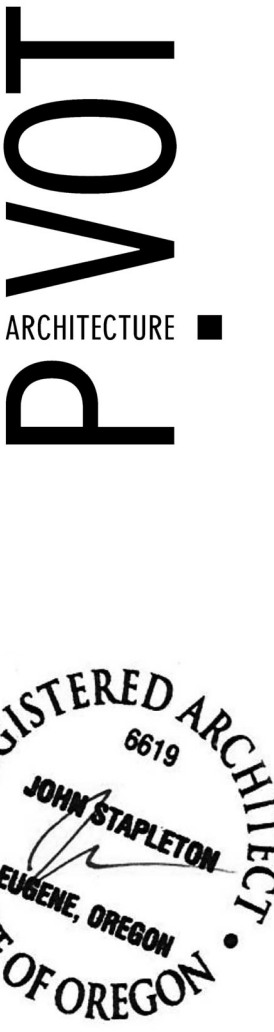
MEETING ROOM TYP - W

GENERAL NOTES - INTERIOR ELEVATION

- A. SEE FINISH PLANS FOR CORNER GUARD LOCATIONS.
- B. INTERIOR ELEVATIONS ARE DRAWN IN TRUE DIMENSIONS, U.N.O. (I.E. ANGLED, CURVED)
- C. SEE PROJECT MANUAL, FINISH PLANS, REFLECTED CEILING PLANS, INTERIOR ELEVATIONS, AND INTERIOR FINISH LEGEND FOR ADDITIONAL FINISH INFORMATION
- D. SEE DOOR AND FRAME TYPES FOR ADDITIONAL FINISH INFORMATION AND REFERENCE TO DETAILS. DOOR SWINGS INDICATED BY DASHED LINES SHOWN ON ELEVATIONS ARE FOR REFERENCE ONLY.
- E. PROVIDE BLOCKING AND BACKING FOR ALL WALL-MOUNTED EQUIPMENT AND FIXTURES TO BE FURNISHED BY THE CONTRACTOR OR OWNER.
- F. SEE ALSO ELECTRICAL, MECHANICAL, PLUMBING, AND TECHNOLOGY DRAWINGS FOR ADDITIONAL WALL MOUNTED EQUIPMENT AND FIXTURES.

FINISH TAG

(B-2) 4" RUBBER BASE	(PT-6) PAINT COLOR - TYPE 6 ACCENT
(FA-1) UPHOLSTERY FABRIC - TYPE 1	(PT-7) PAINT COLOR - TYPE 7 ACCENT
(FA-2) UPHOLSTERY FABRIC - TYPE 2	(PT-8) PAINT COLOR - TYPE 8 ACCENT
(FA-3) UPHOLSTERY FABRIC - TYPE 3	(SS-2) SOLID SURFACE TYPE - 2
(PL-2) PLASTIC LAMINATE TYPE - 2	(SS-3) SOLID SURFACE TYPE - 3
(PT-1) PAINT COLOR - TYPE 1 WHITE	(WD-1) WOOD CEILING PANELS TYPE - 1
(PT-5) PAINT COLOR - TYPE 5 WHITE	(WP-1) WOOD WALL PANEL TYPE - 1

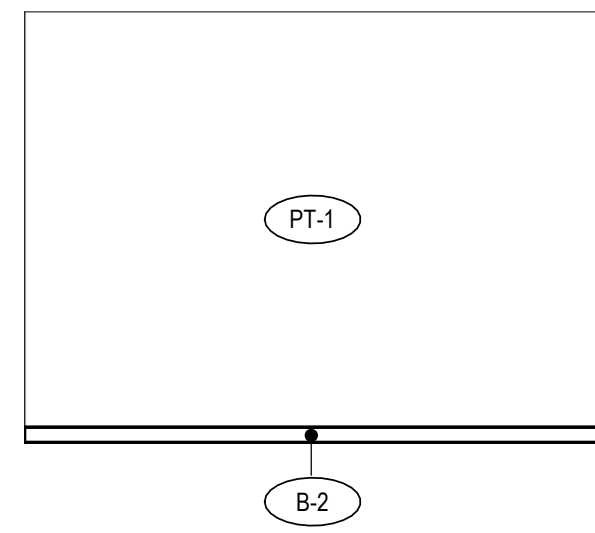


CONSTRUCTION DRAWINGS
 SPRINGFIELD CITY HALL RENOVATION
 PROJECT #: 2125.00
 CITY OF SPRINGFIELD
 225 5TH STREET SPRINGFIELD, OR 97477

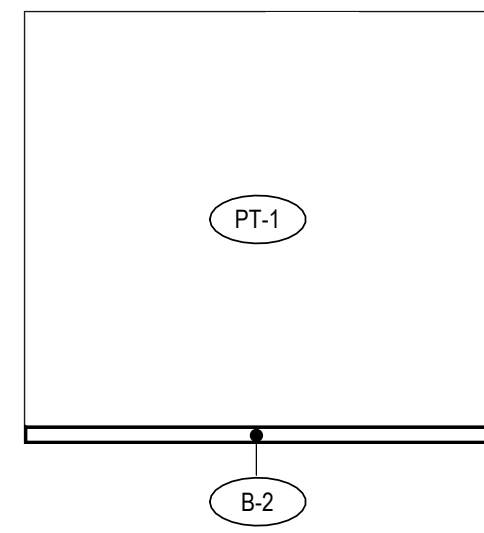
SHEET TITLE:
INTERIOR ELEVATIONS - LIBRARY

REVISIONS:
 # DESCRP. DATE

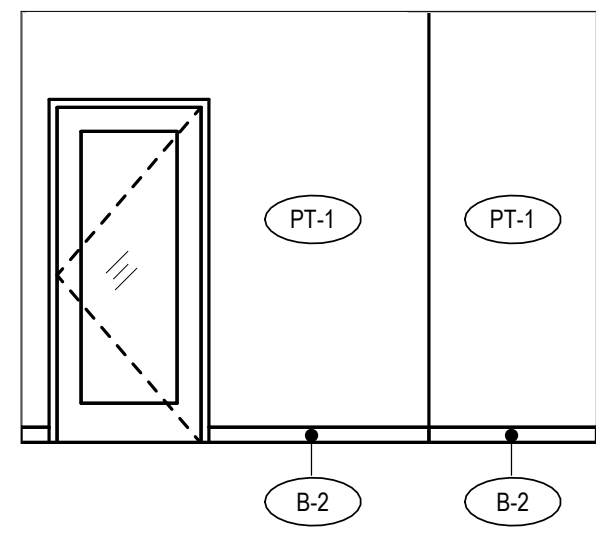
ISSUE DATE: 09.28.2023



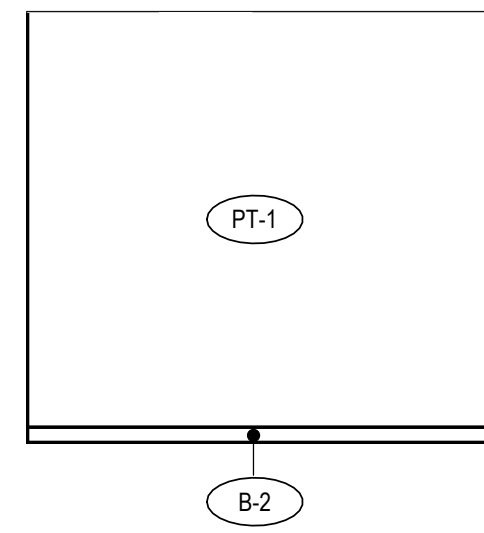
1 325A OFFICE - N
1/4" = 1'-0"



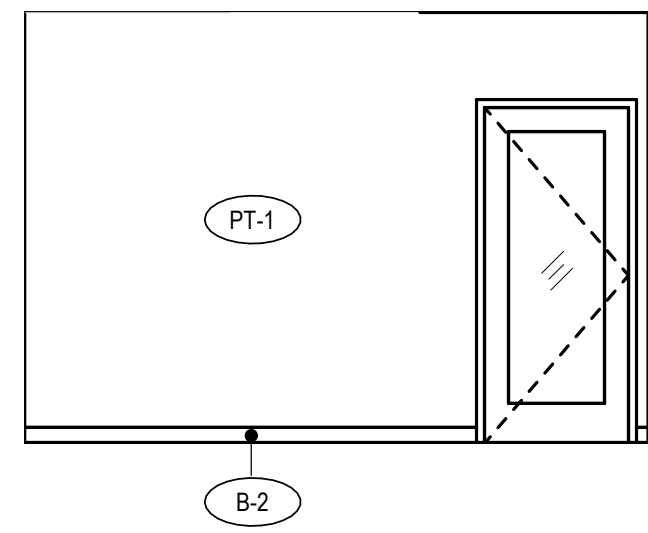
325A OFFICE - E



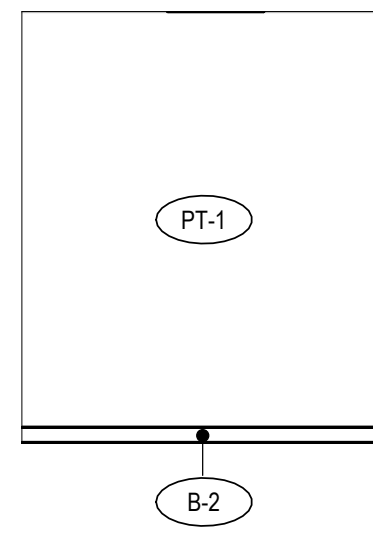
325A OFFICE - S



325A OFFICE - W



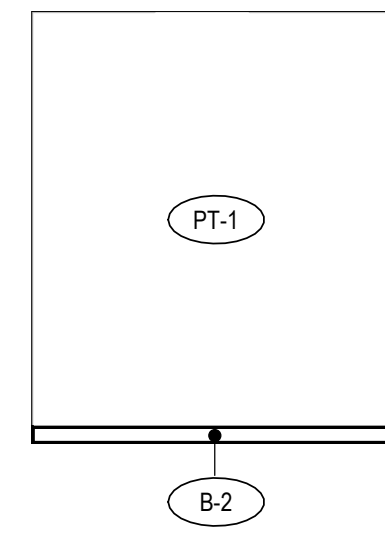
2 325B OFFICE - N
1/4" = 1'-0"



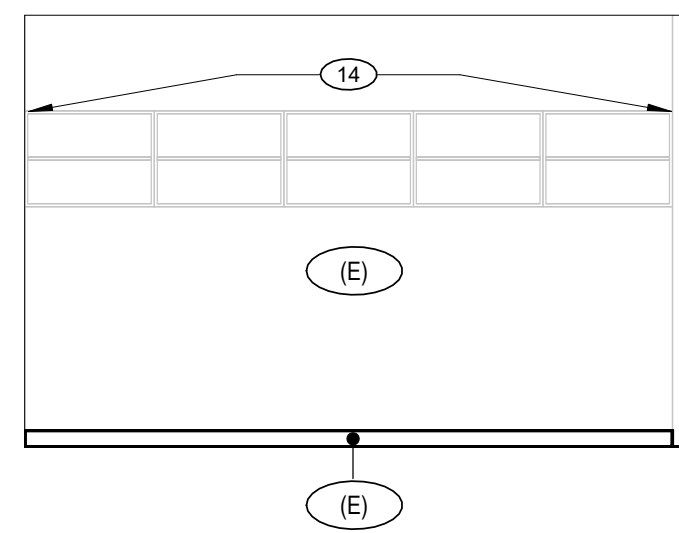
325B OFFICE - E



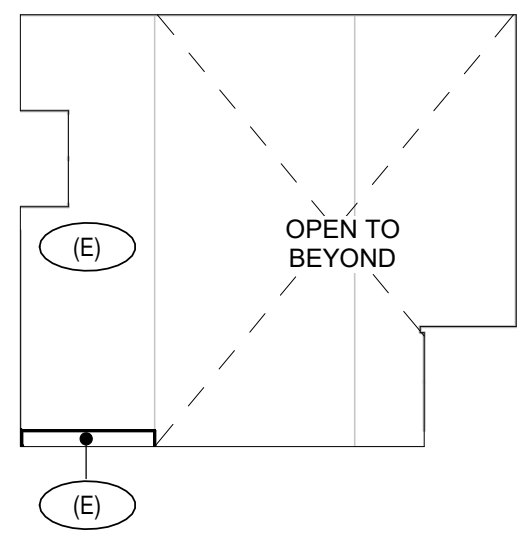
325B OFFICE - S



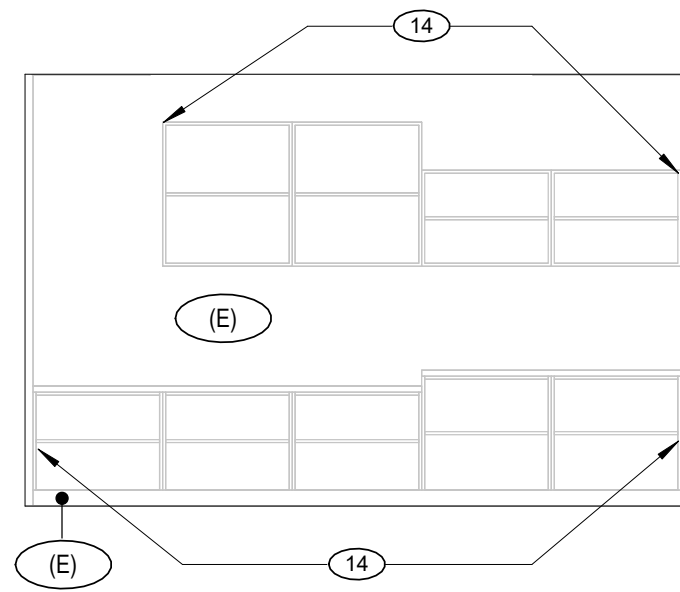
325B OFFICE - W



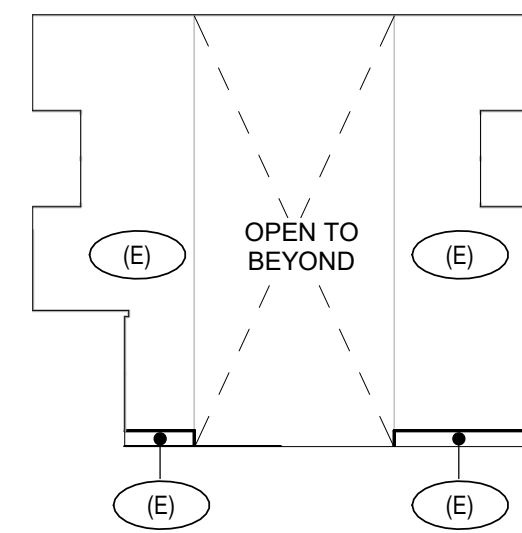
3 405 WORKROOM - N
1/4" = 1'-0"



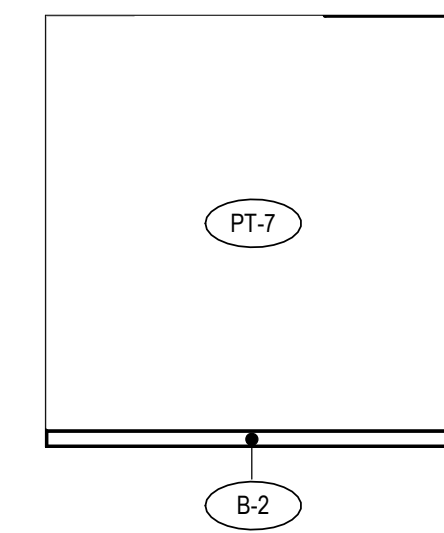
405 WORKROOM - E



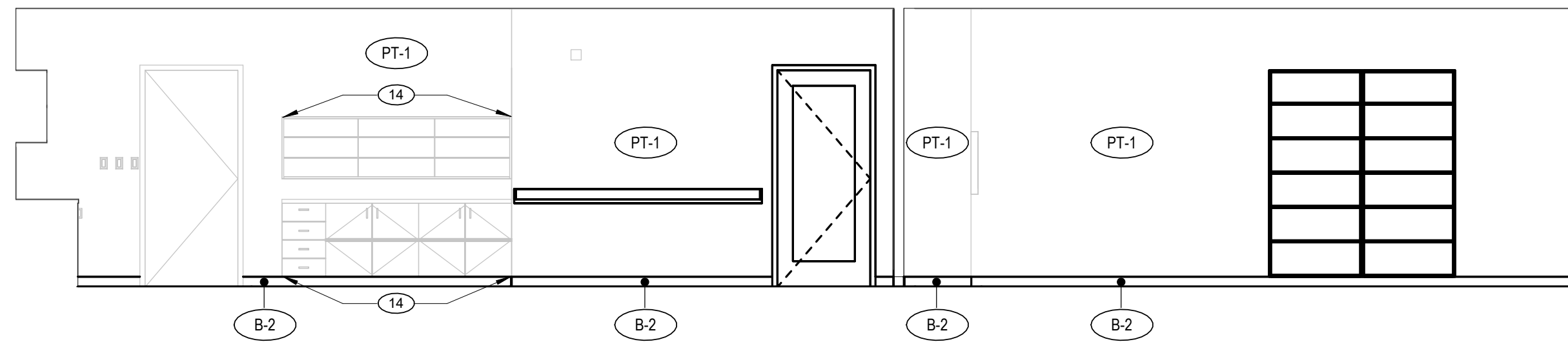
405 WORKROOM - S



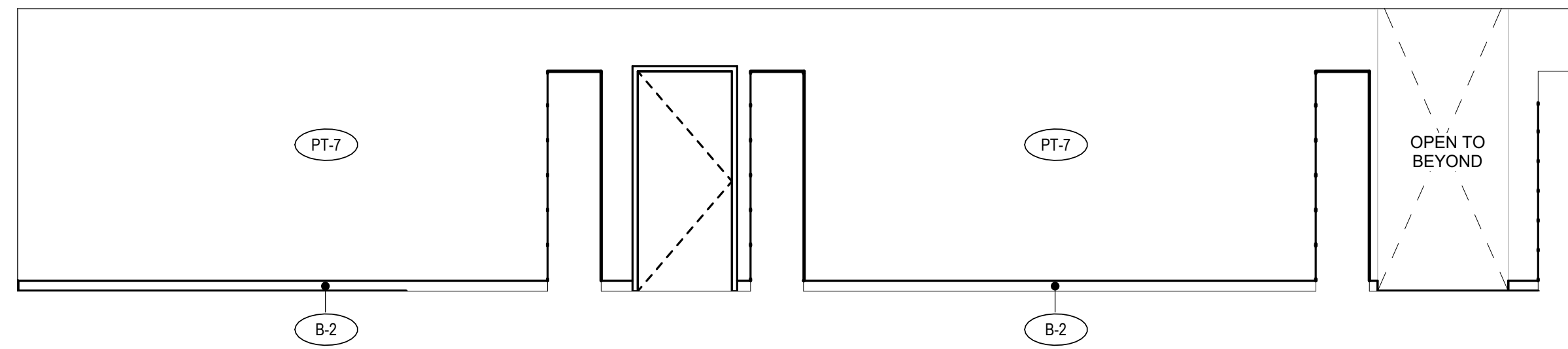
405 WORKROOM - W



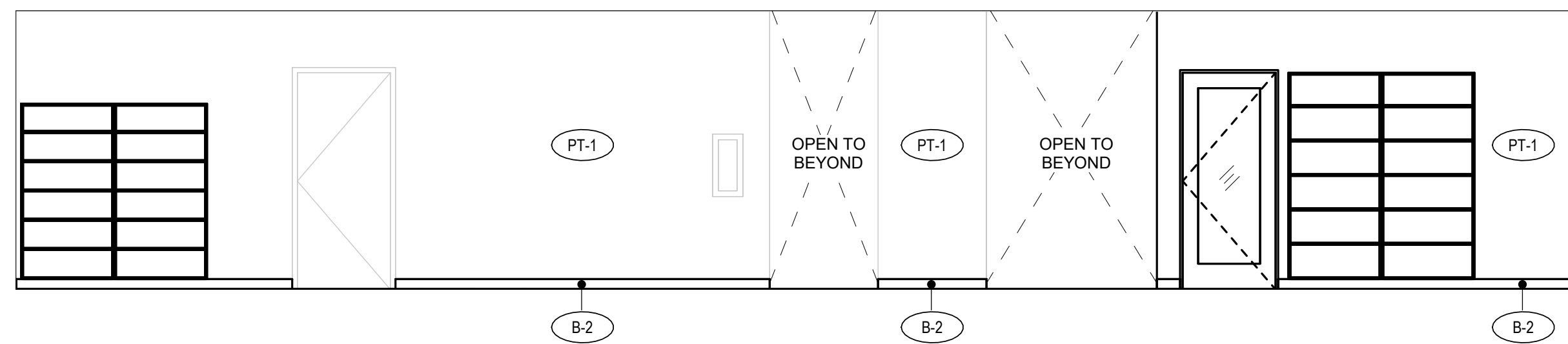
4 STAFF OFFICE - S
1/4" = 1'-0"



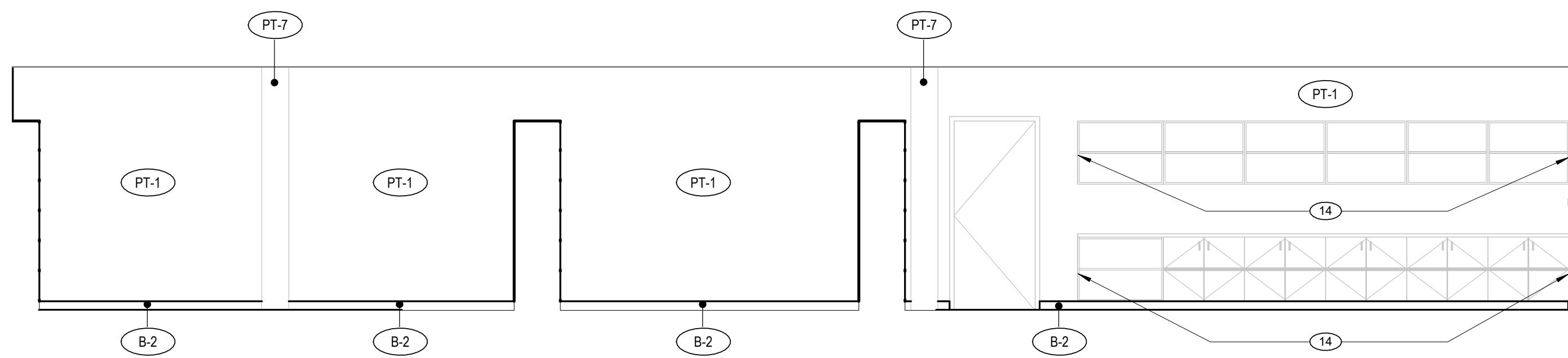
5 LIBRARY STAFF - N
1/4" = 1'-0"



LIBRARY STAFF - E



LIBRARY STAFF - S



LIBRARY STAFF - W

GENERAL NOTES - INTERIOR ELEVATION

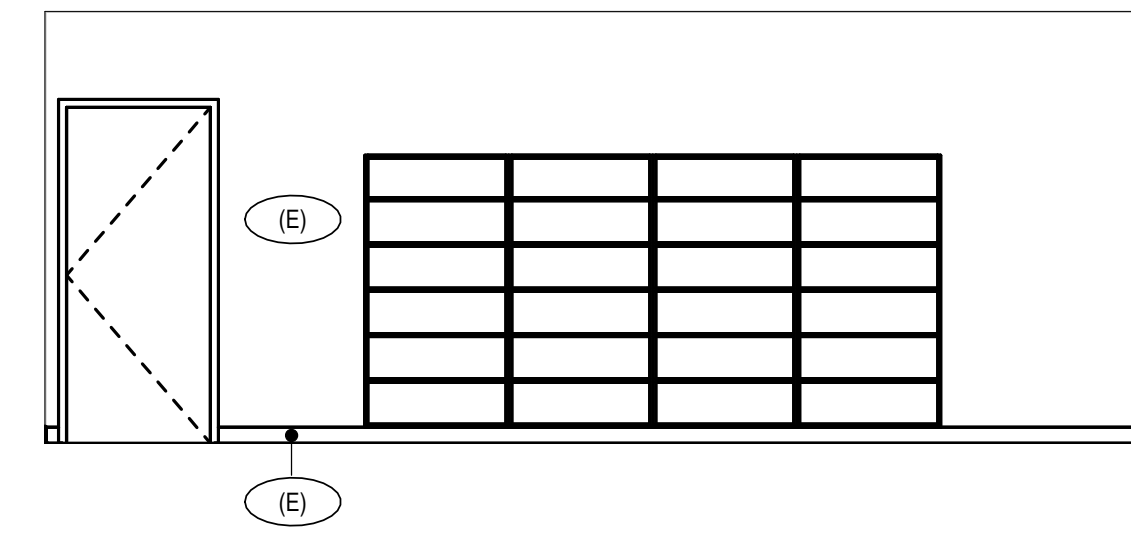
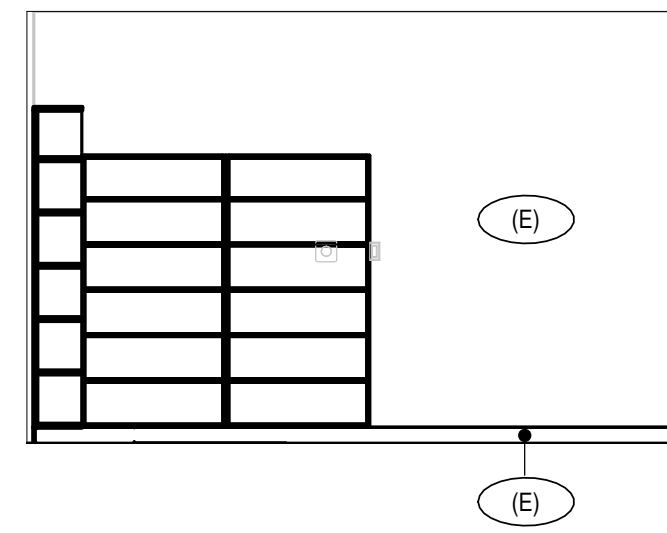
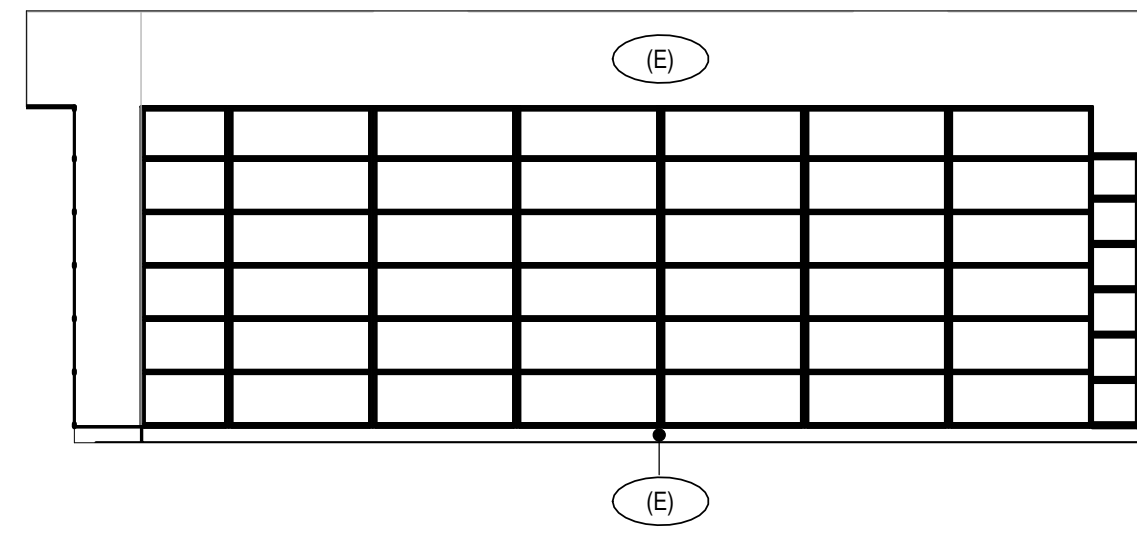
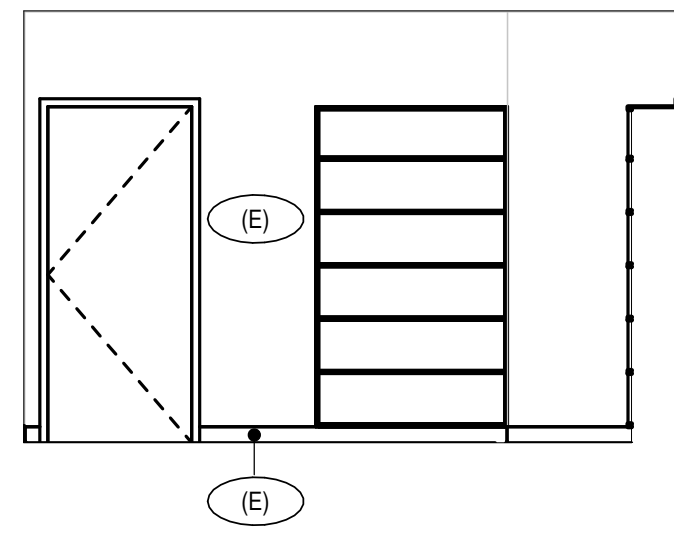
- A. SEE FINISH PLANS FOR CORNER GUARD LOCATIONS.
- B. INTERIOR ELEVATIONS ARE DRAWN IN TRUE DIMENSIONS, U.N.O. (I.E. ANGLED, CURVED)
- C. SEE PROJECT MANUAL, FINISH PLANS, REFLECTED CEILING PLANS, INTERIOR ELEVATIONS, AND INTERIOR FINISH LEGEND FOR ADDITIONAL FINISH INFORMATION
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- E. PROVIDE BLOCKING AND BACKING FOR ALL WALL-MOUNTED EQUIPMENT AND FIXTURES TO BE FURNISHED BY THE CONTRACTOR OR OWNER.
- F. SEE ALSO ELECTRICAL, MECHANICAL, PLUMBING, AND TECHNOLOGY DRAWINGS FOR ADDITIONAL WALL MOUNTED EQUIPMENT AND FIXTURES.

KEYNOTES

- 14 EXISTING CASEWORK TO REMAIN

FINISH TAG

(B-2)	4" RUBBER BASE	(PT-6)	PAINT COLOR - TYPE 6 ACCENT
(FA-1)	UPHOLSTERY FABRIC - TYPE 1	(PT-7)	PAINT COLOR - TYPE 7 ACCENT
(FA-2)	UPHOLSTERY FABRIC - TYPE 2	(PT-8)	PAINT COLOR - TYPE 8 ACCENT
(FA-3)	UPHOLSTERY FABRIC - TYPE 3	(SS-2)	SOLID SURFACE TYPE - 2
(PL-2)	PLASTIC LAMINATE TYPE - 2	(SS-3)	SOLID SURFACE TYPE - 3
(PT-1)	PAINT COLOR - TYPE 1 WHITE	(WD-1)	WOOD CEILING PANELS TYPE - 1
(PT-5)	PAINT COLOR - TYPE 5 WHITE	(WP-1)	WOOD WALL PANEL TYPE - 1



1 403 STORAGE - N
1/4" = 1'-0"

403 STORAGE - E

403 STORAGE - S

403 STORAGE - W

GENERAL NOTES - INTERIOR ELEVATION

- A. SEE FINISH PLANS FOR CORNER GUARD LOCATIONS.
- B. INTERIOR ELEVATIONS ARE DRAWN IN TRUE DIMENSIONS, U.N.O. (I.E. ANGLED, CURVED)
- C. SEE PROJECT MANUAL, FINISH PLANS, REFLECTED CEILING PLANS, INTERIOR ELEVATIONS, AND INTERIOR FINISH LEGEND FOR ADDITIONAL FINISH INFORMATION
- D. SEE DOOR AND FRAME TYPES FOR ADDITIONAL FINISH INFORMATION AND REFERENCE TO DETAILS. DOOR SWINGS INDICATED BY DASHED LINES SHOWN ON ELEVATIONS ARE FOR REFERENCE ONLY.
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- F. SEE ALSO ELECTRICAL, MECHANICAL, PLUMBING, AND TECHNOLOGY DRAWINGS FOR ADDITIONAL WALL MOUNTED EQUIPMENT AND FIXTURES.

KEYNOTES - SPECIFICATION

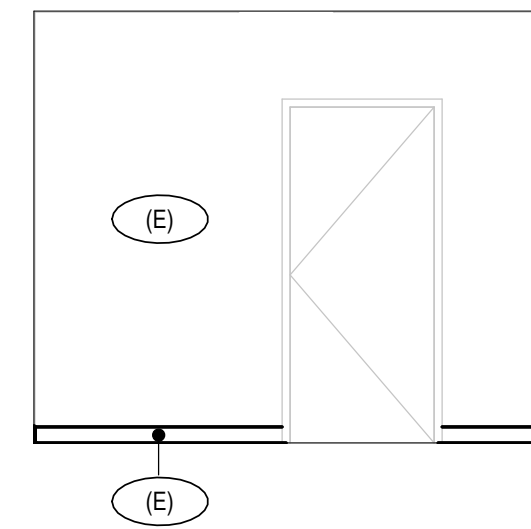
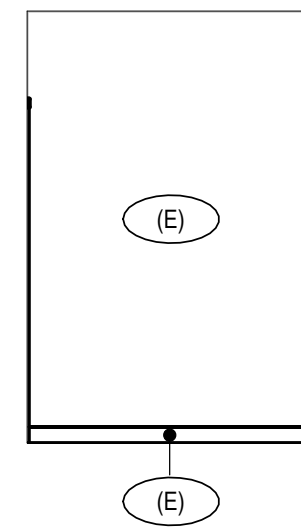
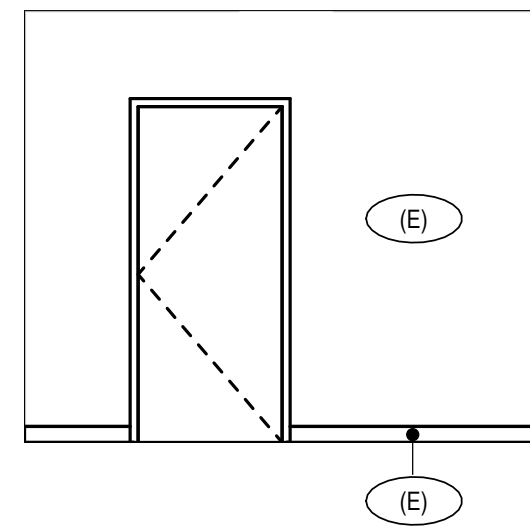
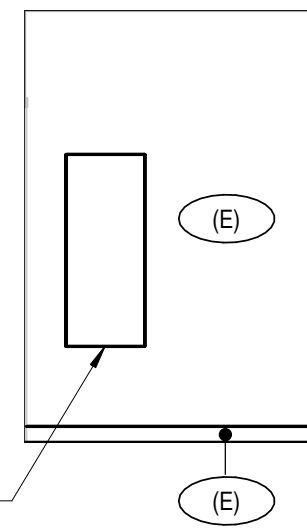
- 01 1100-B DISHWASHER, OFCI
- 06 4100-L 23" D BASE CABINET WITH DOORS AND ADJUSTABLE SHELF
- 06 4100-M 23" D BASE CABINET WITH (4) EQUAL DRAWERS
- 06 4100-N 12" D UPPER CABINET WITH ADJUSTABLE SHELF
- 26 0000-A ELECTRICAL PANEL, SEE ELECTRICAL

KEYNOTES

- 5 (E) RESIDENTIAL RANGE AND MICROWAVE EXHAUST ABOVE TO REMAIN
- 15 (E) REFRIGERATOR TO REMAIN

FINISH TAG

- | | |
|-----------------------------------|-------------------------------------|
| (B-2) 4" RUBBER BASE | (PT-6) PAINT COLOR - TYPE 6 ACCENT |
| (FA-1) UPHOLSTERY FABRIC - TYPE 1 | (PT-7) PAINT COLOR - TYPE 7 ACCENT |
| (FA-2) UPHOLSTERY FABRIC - TYPE 2 | (PT-8) PAINT COLOR - TYPE 8 ACCENT |
| (FA-3) UPHOLSTERY FABRIC - TYPE 3 | (SS-2) SOLID SURFACE TYPE - 2 |
| (PL-2) PLASTIC LAMINATE TYPE - 2 | (SS-3) SOLID SURFACE TYPE - 3 |
| (PT-1) PAINT COLOR - TYPE 1 WHITE | (WD-1) WOOD CEILING PANELS TYPE - 1 |
| (PT-5) PAINT COLOR - TYPE 5 WHITE | (WP-1) WOOD WALL PANEL TYPE - 1 |

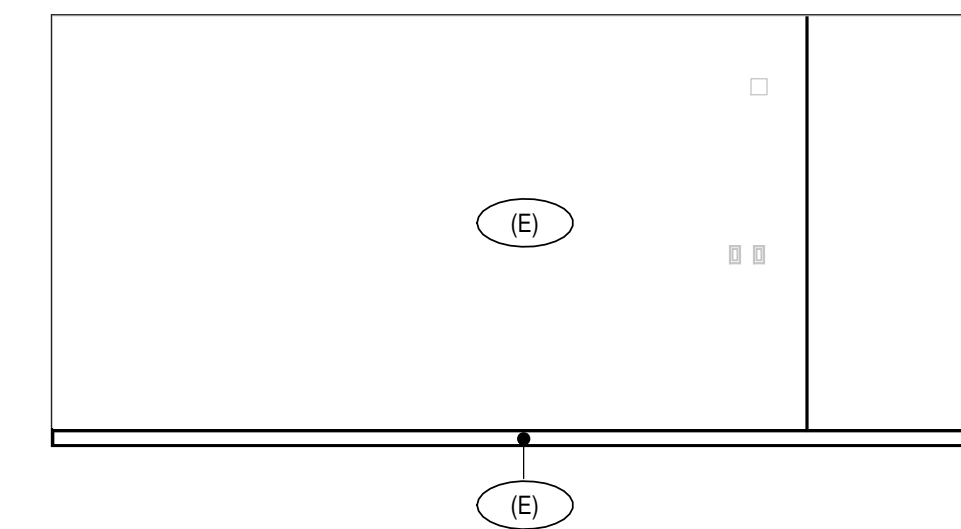
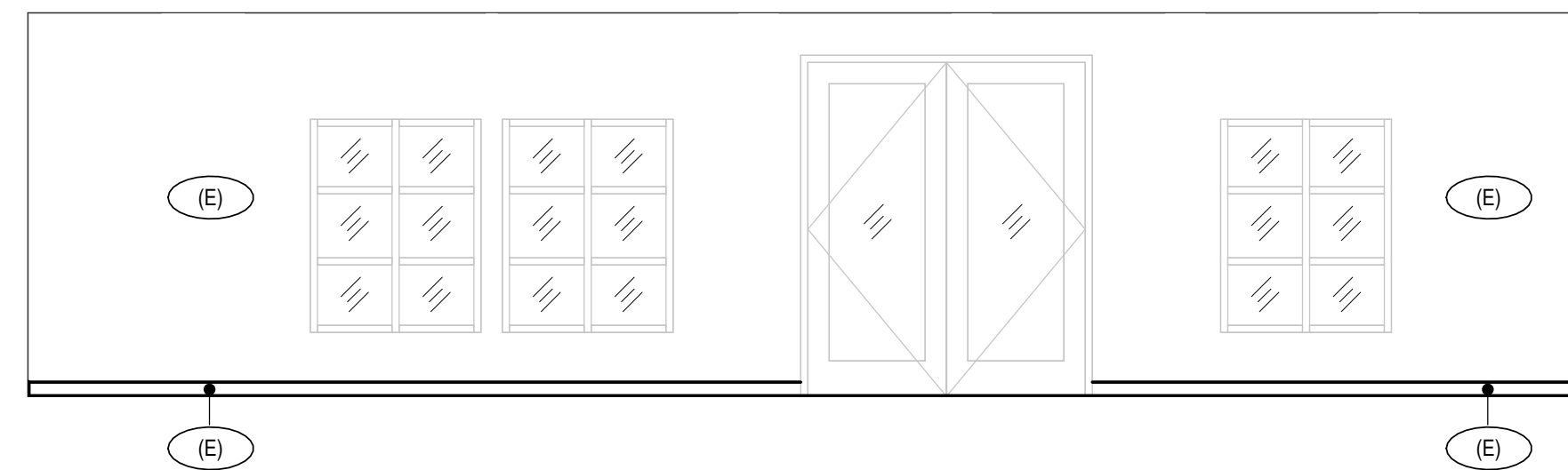
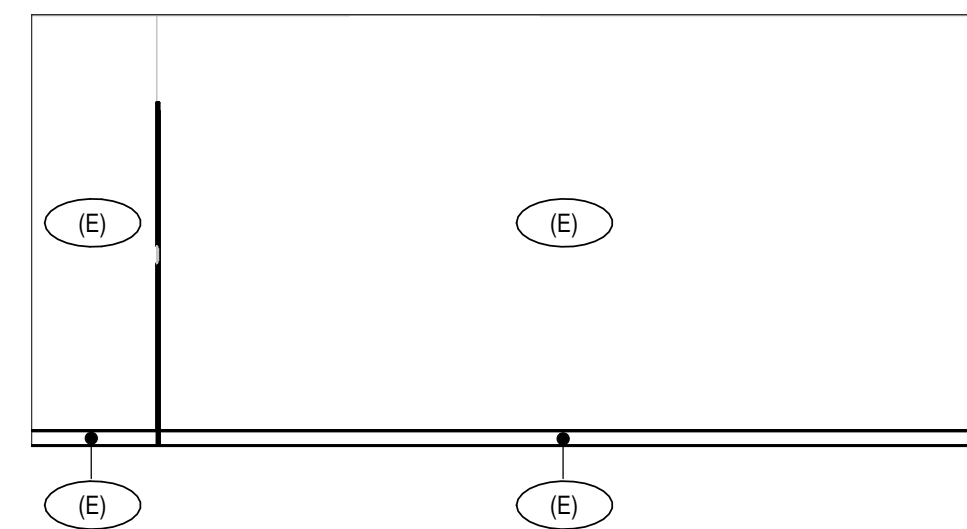


2 322 STORAGE - N
1/4" = 1'-0"

322 STORAGE - E

322 STORAGE - S

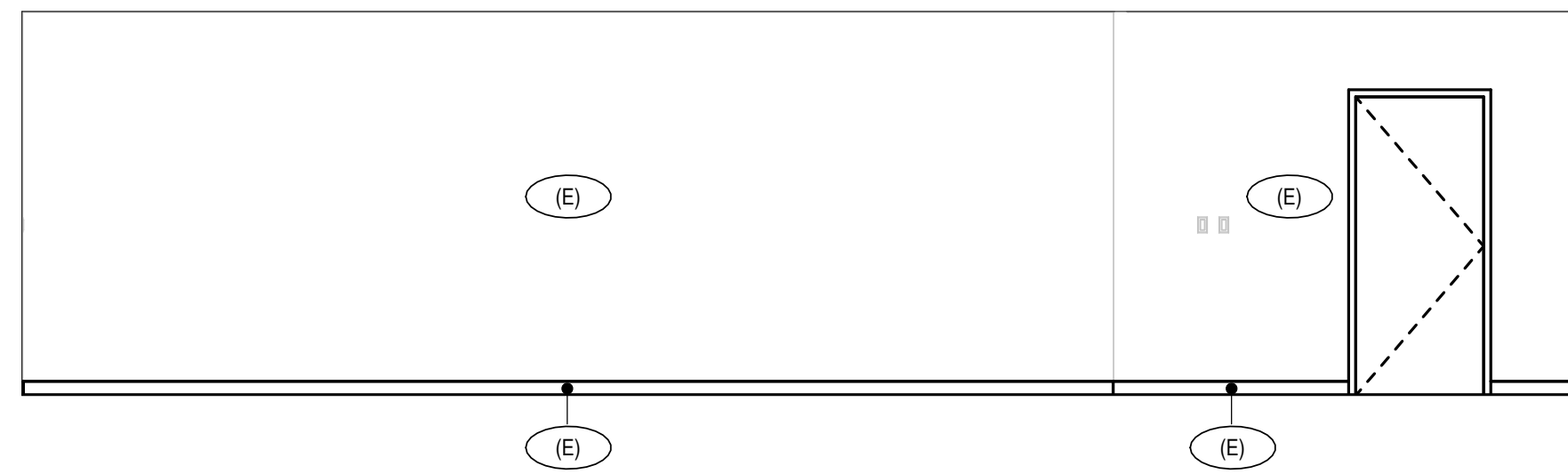
322 STORAGE - W



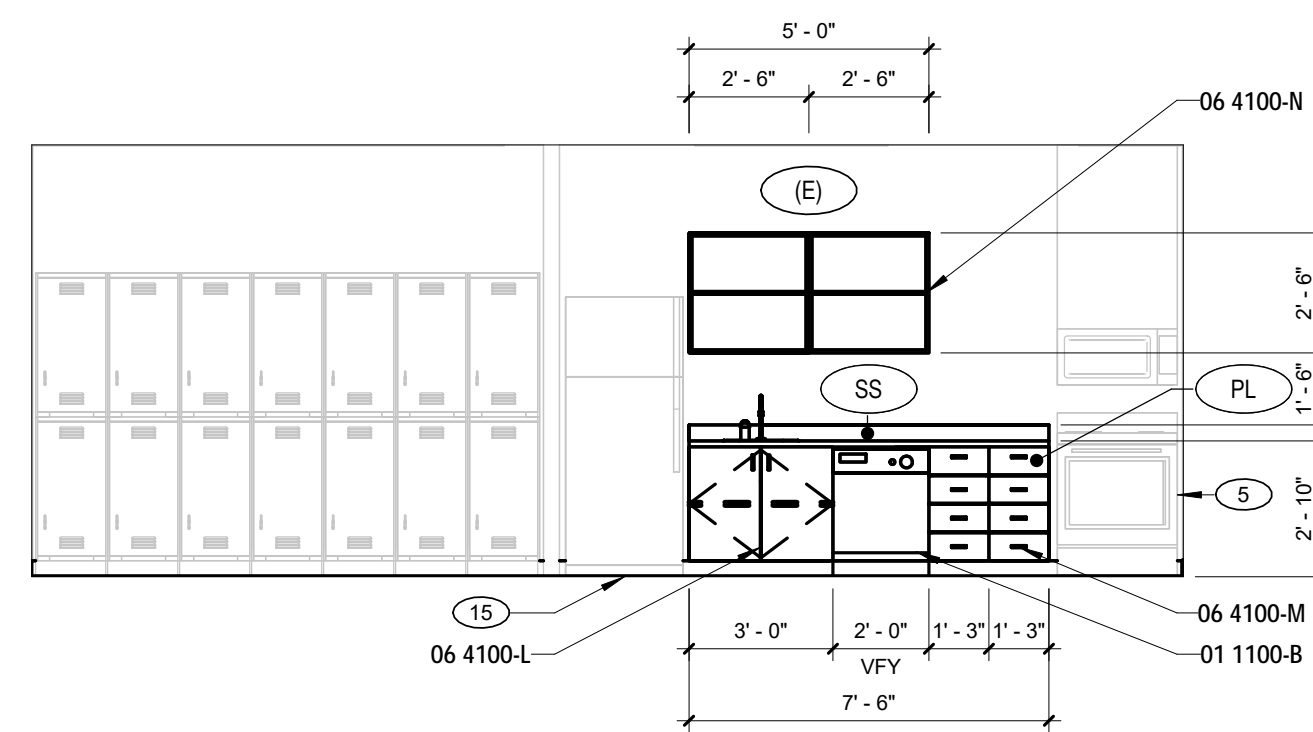
3 401 CONFERENCE - N
1/4" = 1'-0"

401 CONFERENCE - E

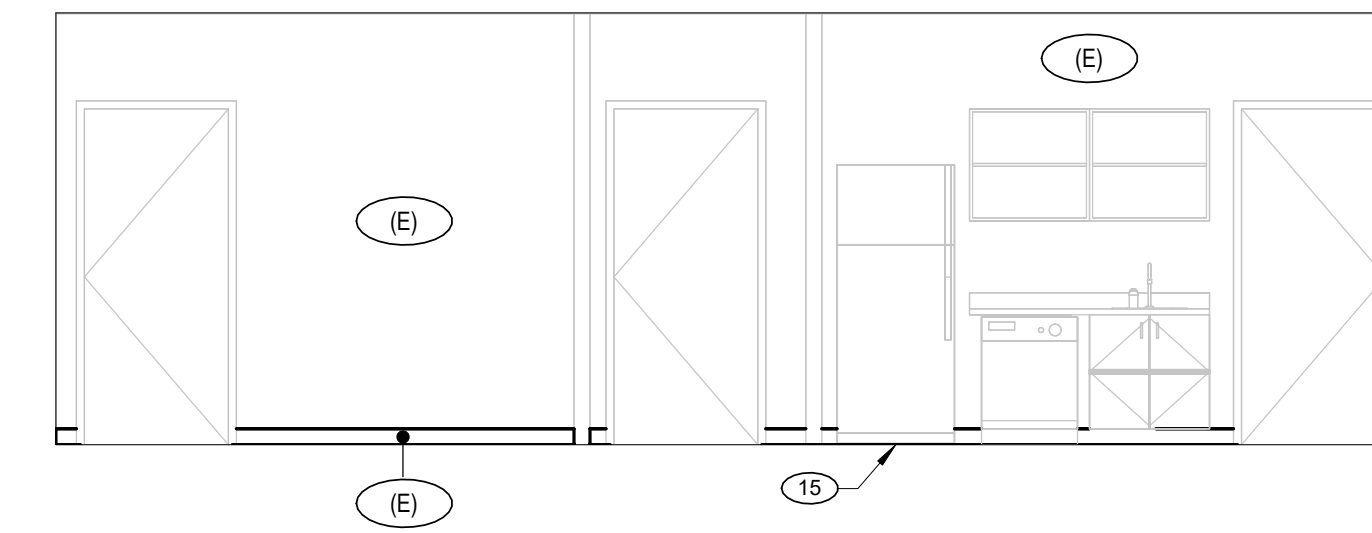
401 CONFERENCE - S



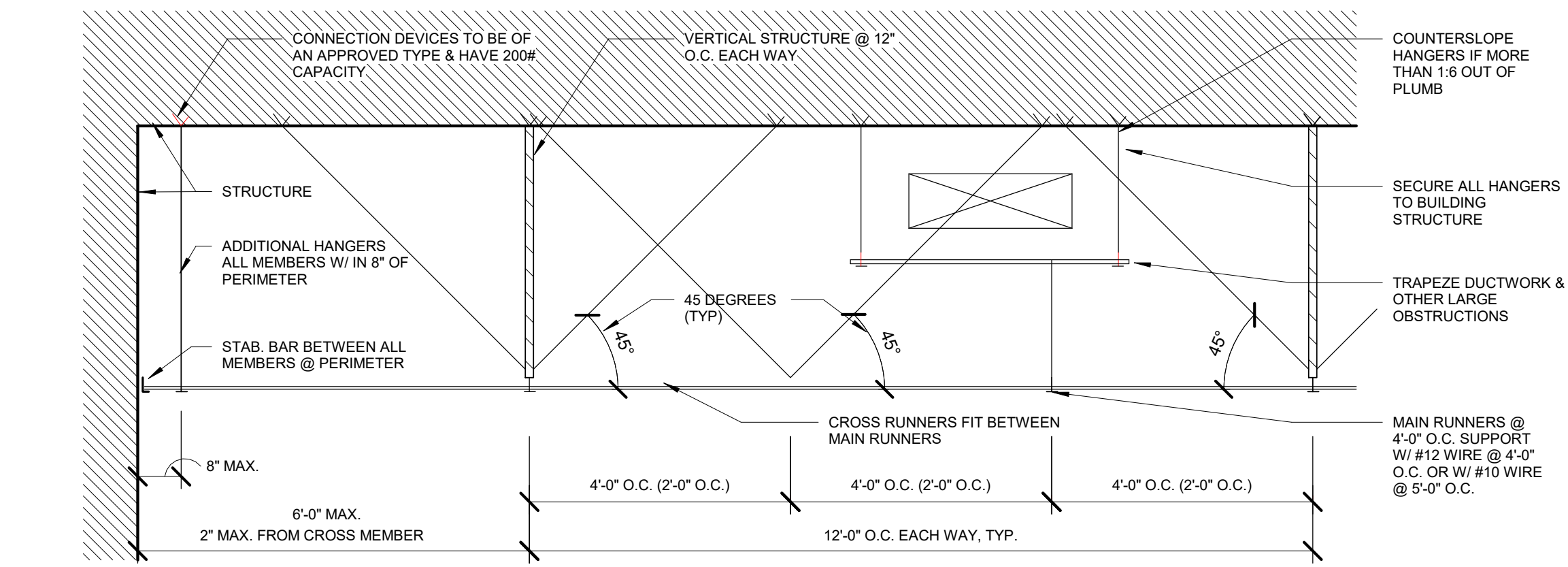
401 CONFERENCE - W



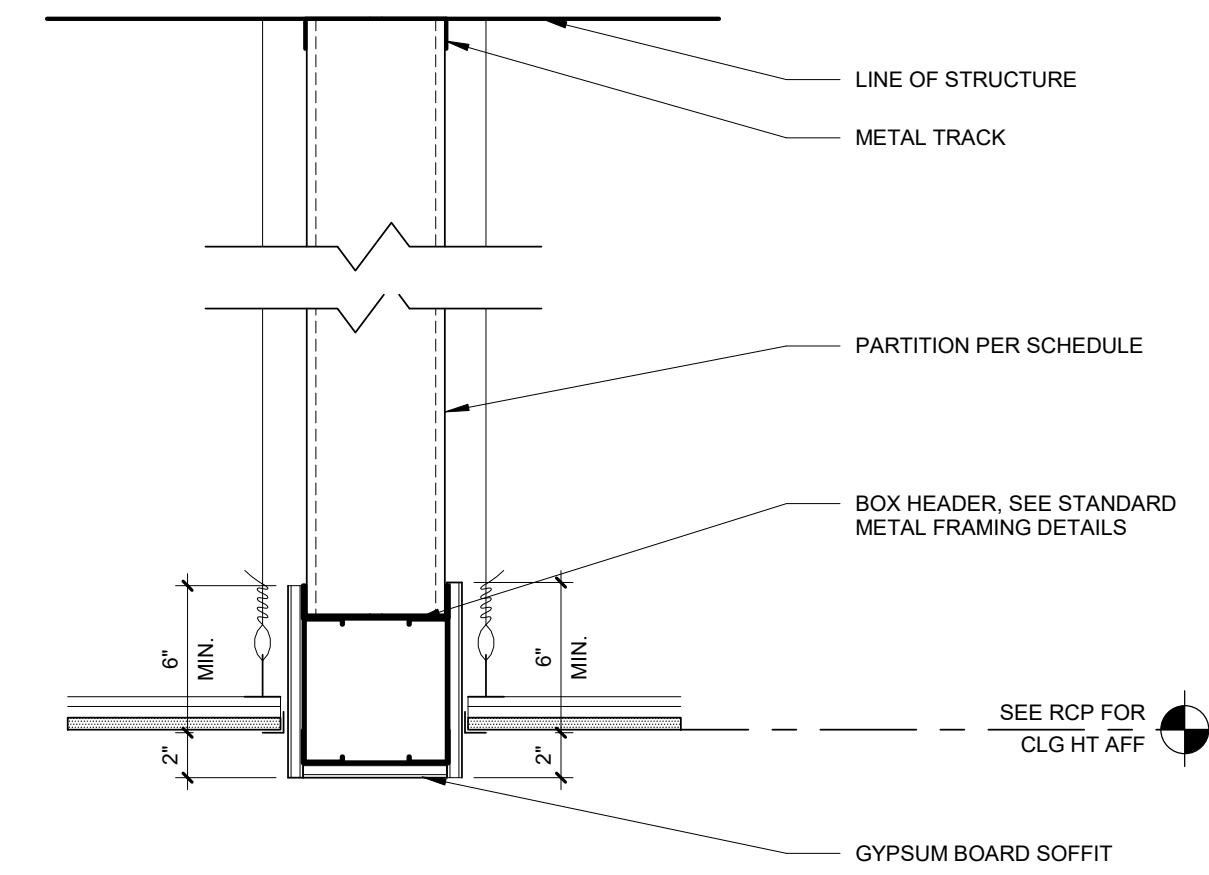
4 328 LUNCH ROOM - N
1/4" = 1'-0"



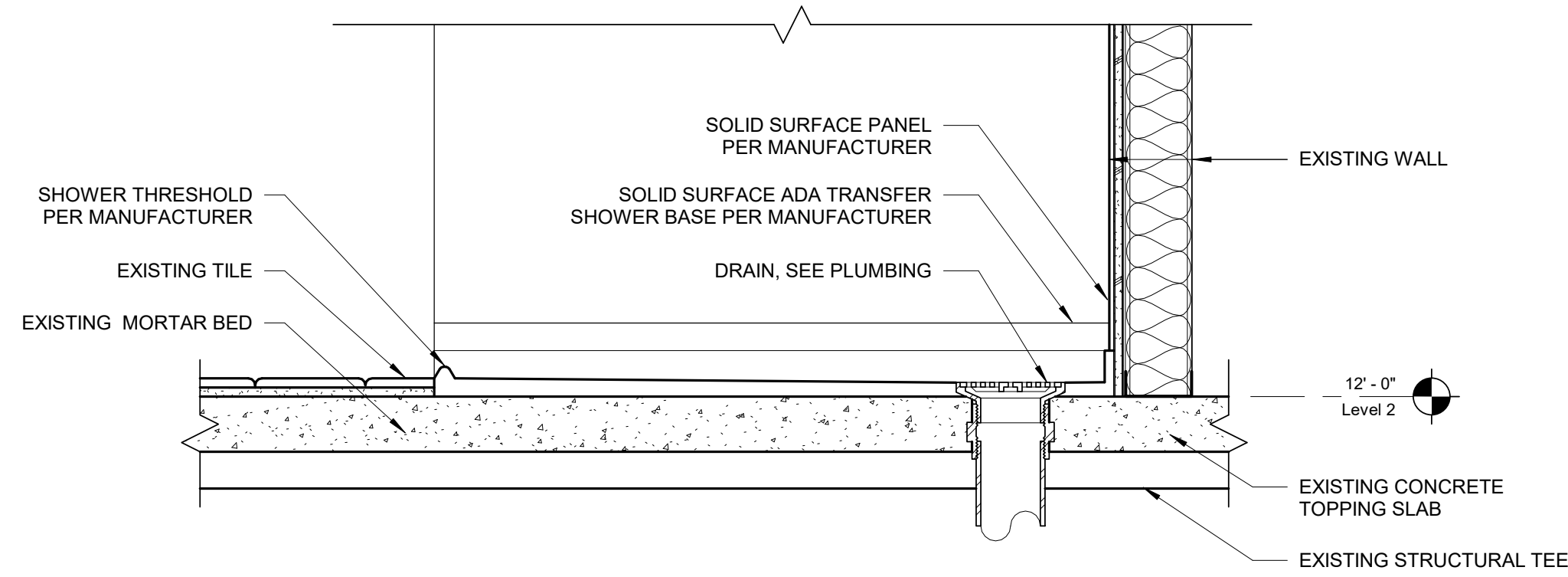
5 408 WORK AREA - E
1/4" = 1'-0"



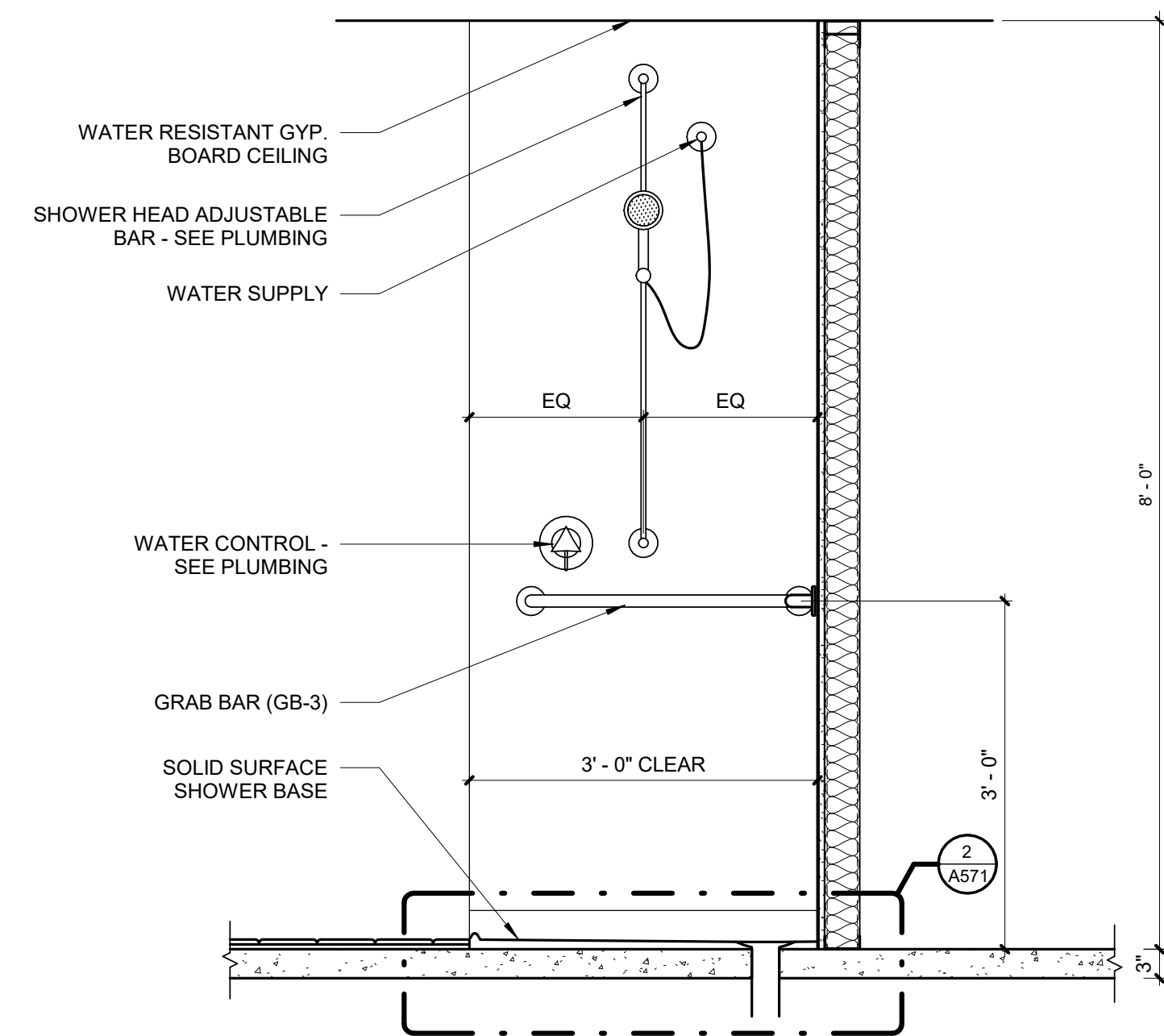
4 SUSPENDED CEILING BRACING
1 1/2" = 1'-0"



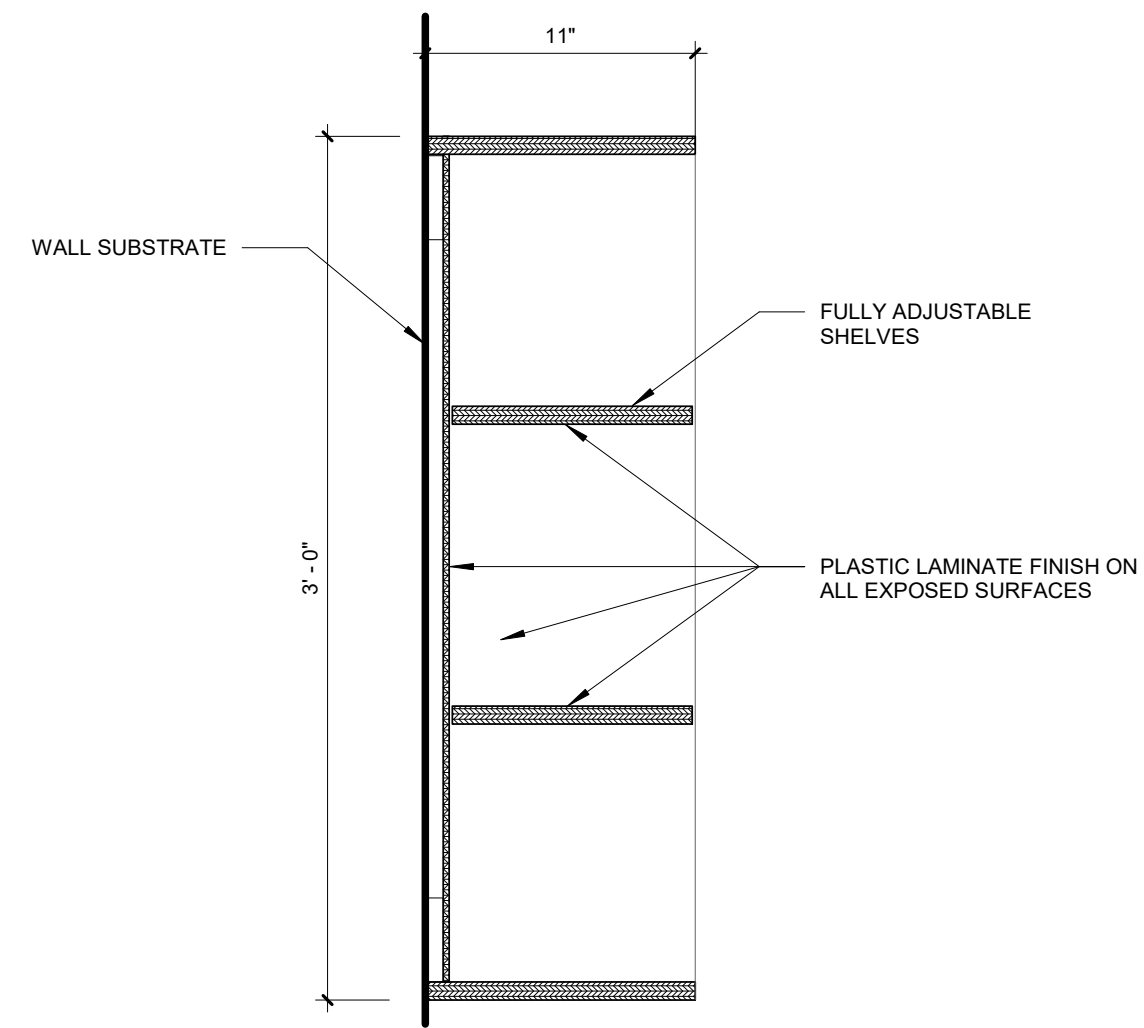
3 SOFFIT DETAIL
1 1/2" = 1'-0"



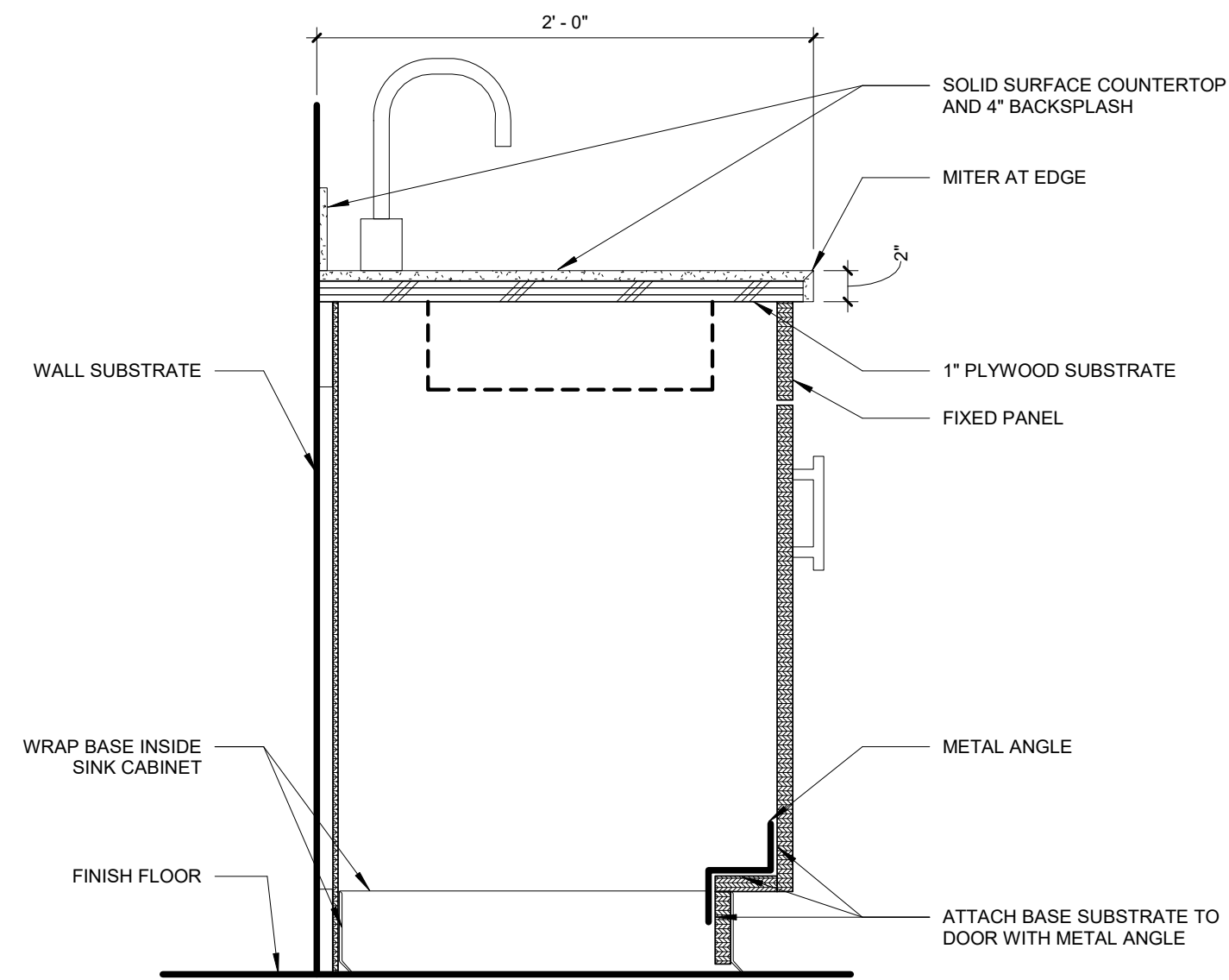
2 SHOWER DETAIL
1 1/2" = 1'-0"



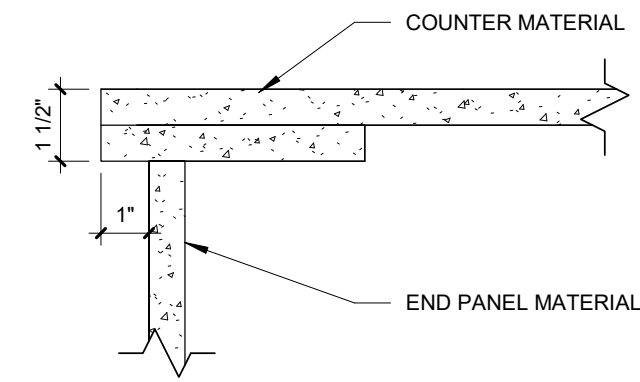
1 SHOWER SECTION
3/4" = 1'-0"



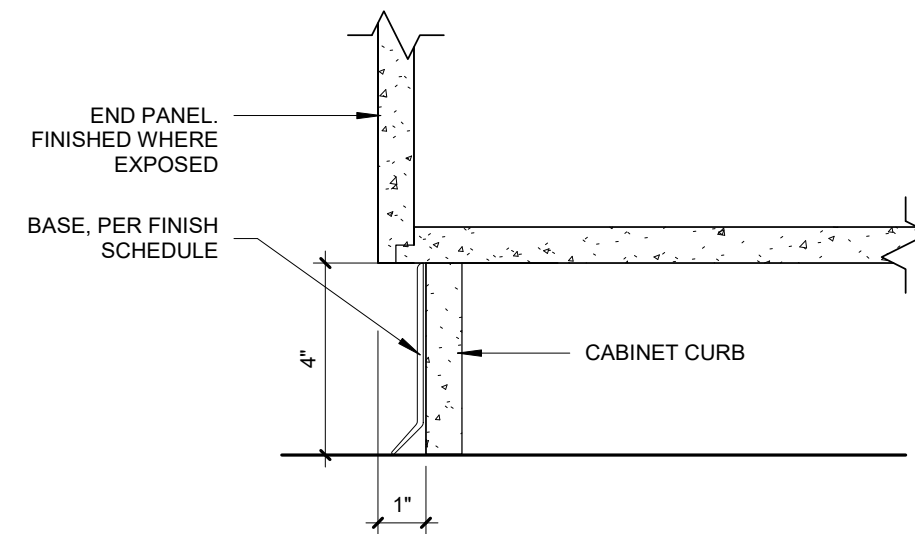
8 UPPER CABINET OPEN SHELVES
1 1/2" = 1'-0"



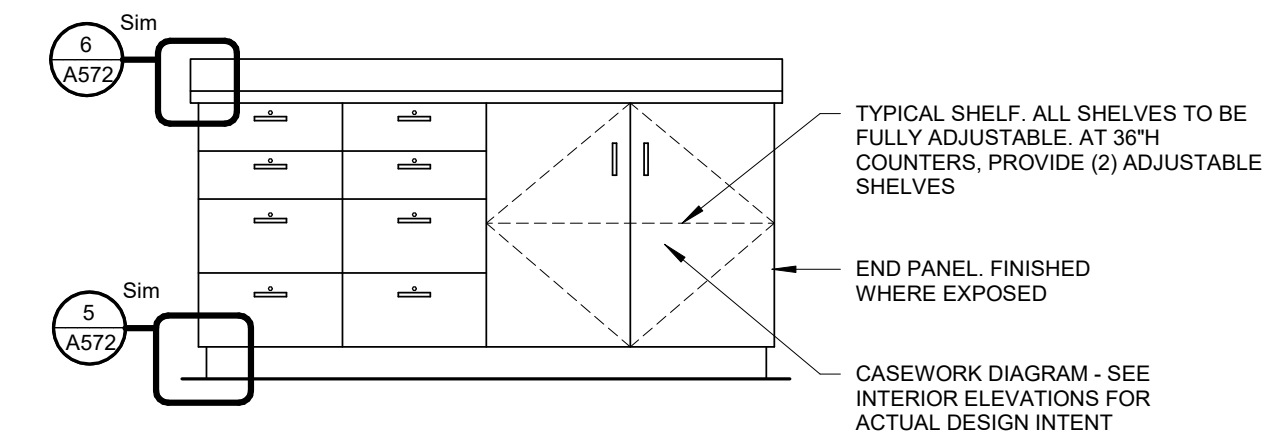
7 ACCESSIBLE SINK CABINET
1 1/2" = 1'-0"



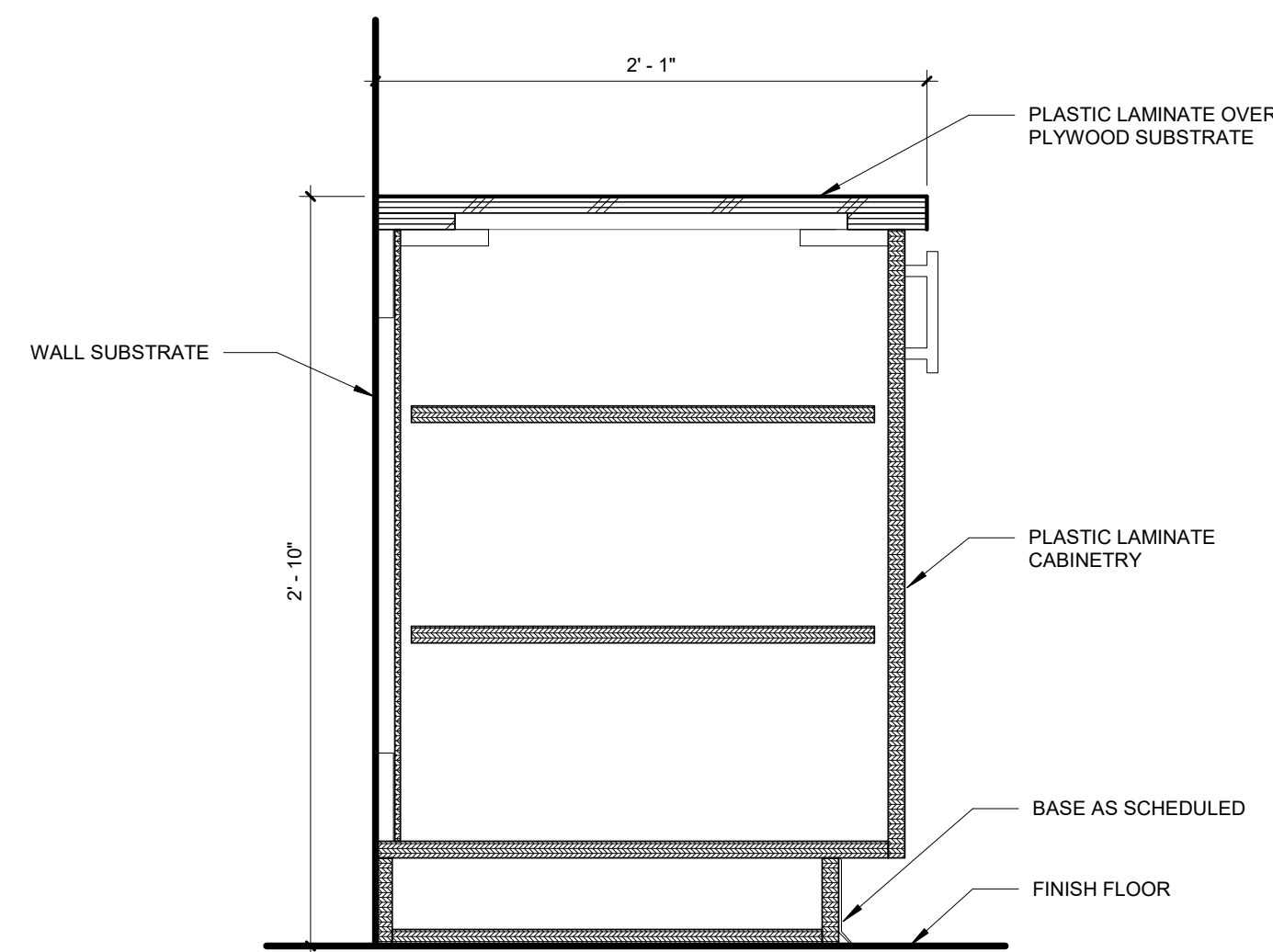
6 TYPICAL CASEWORK COUNTER DETAIL
3" = 1'-0"



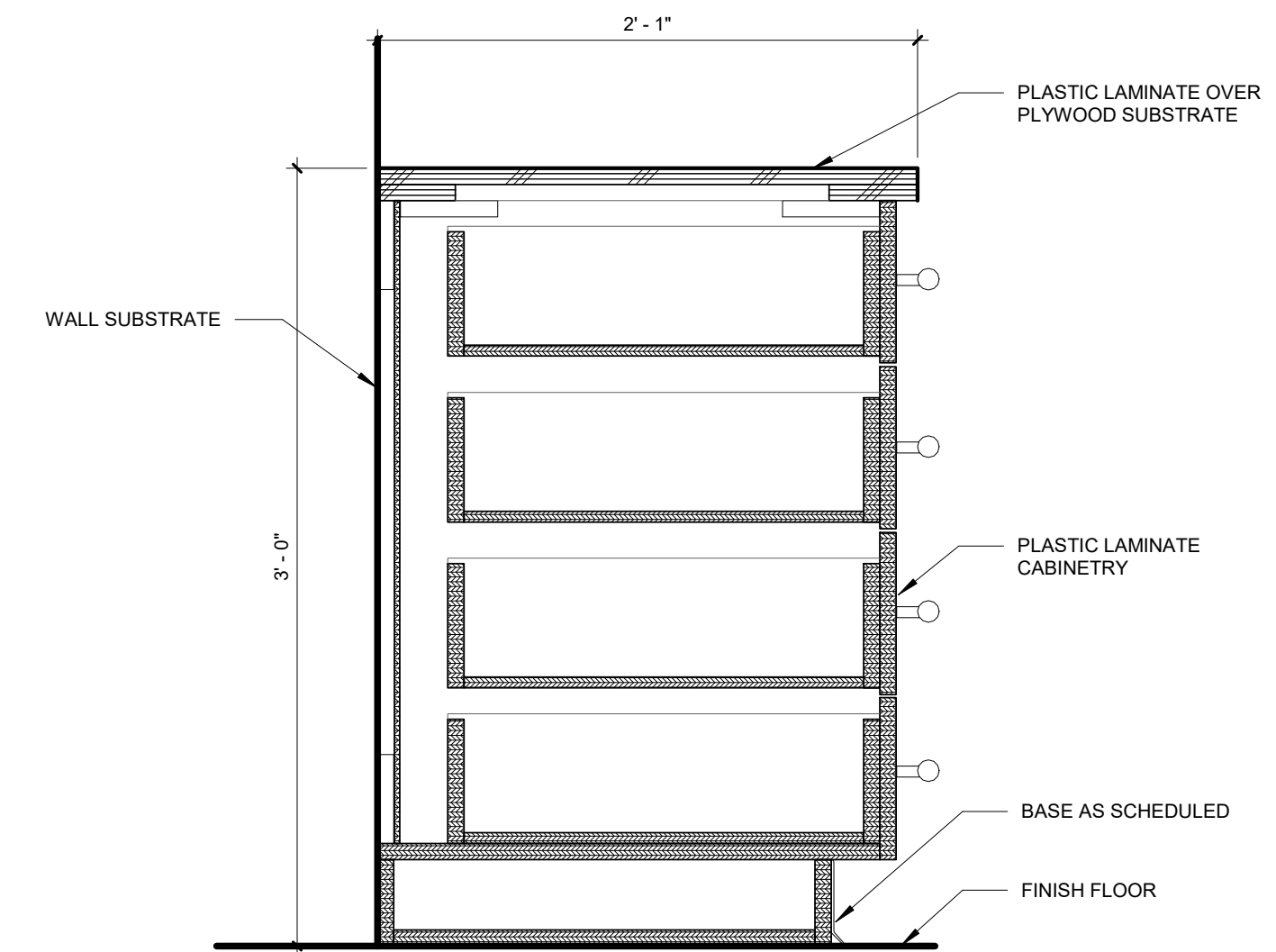
5 TYPICAL CASEWORK END DETAIL
3" = 1'-0"



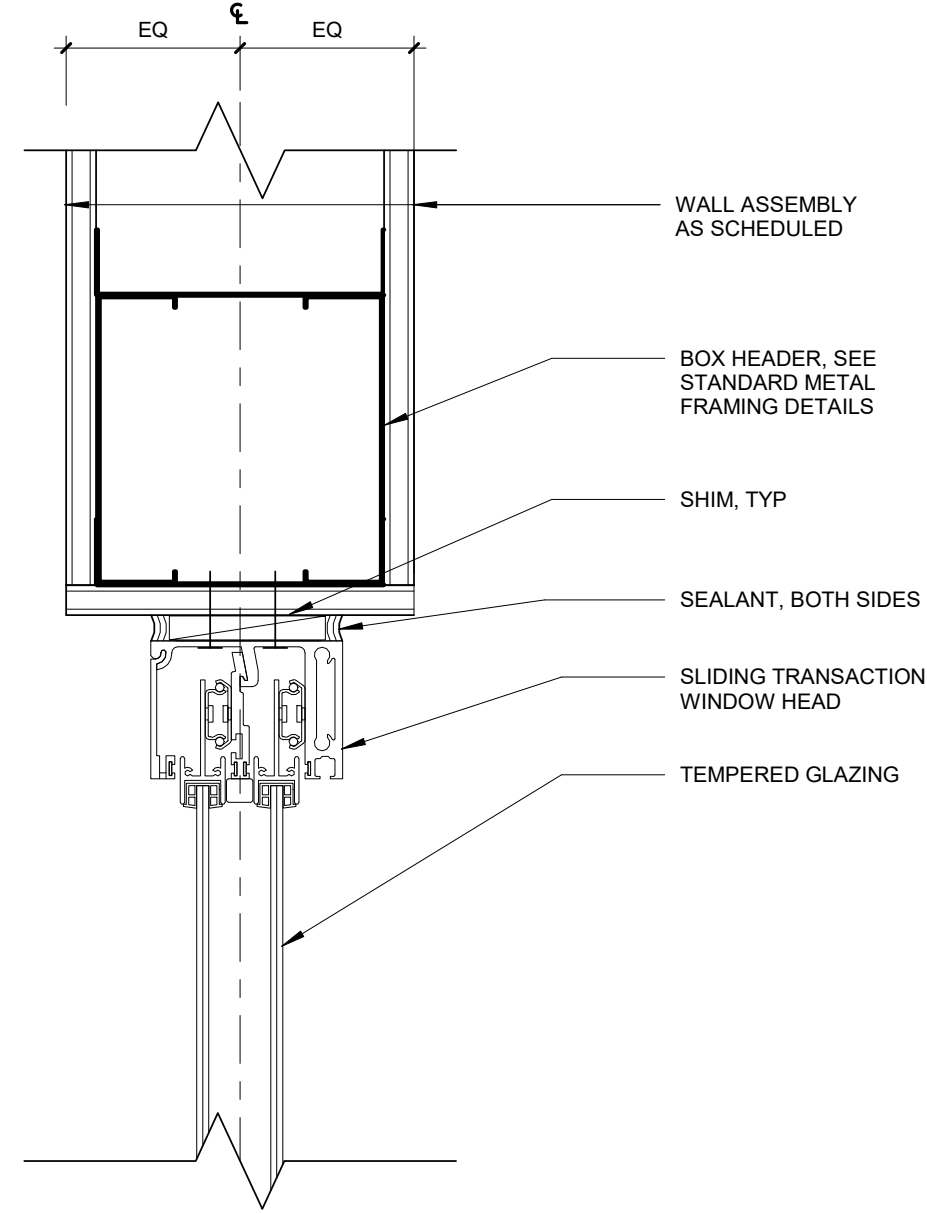
2 TYPICAL CASEWORK DIAGRAM
1/2" = 1'-0"



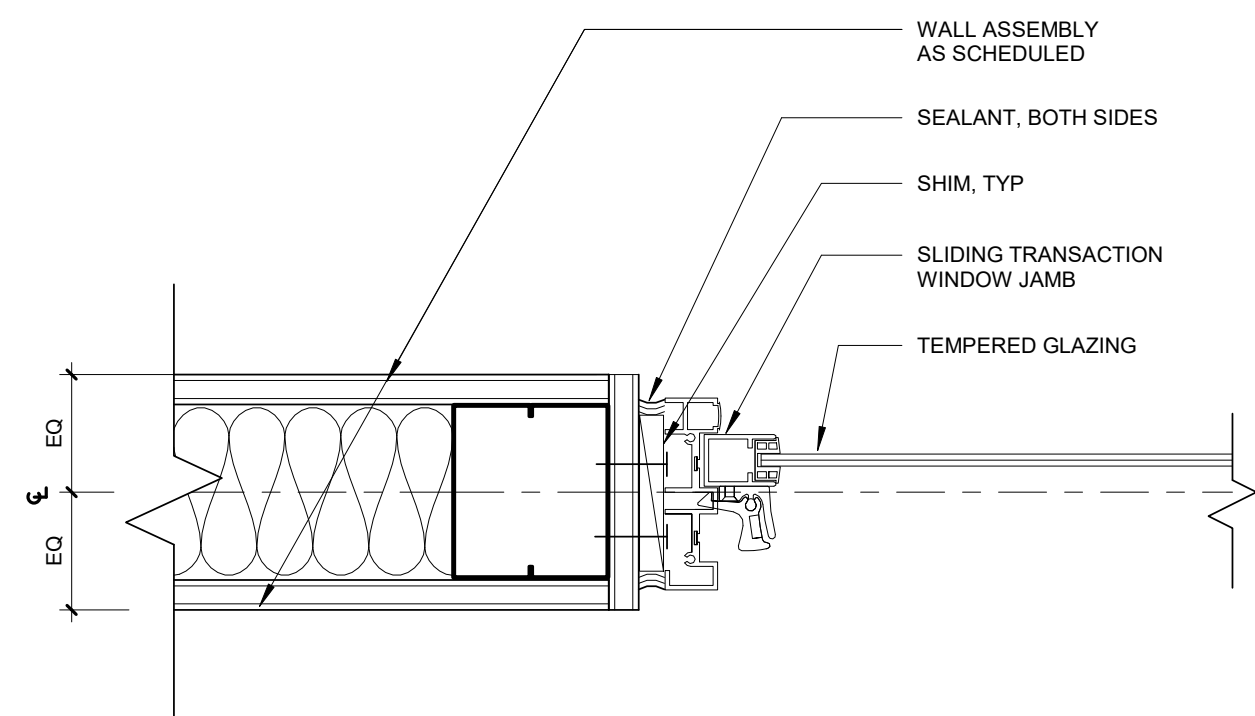
4 BASE CABINET DOOR
1 1/2" = 1'-0"



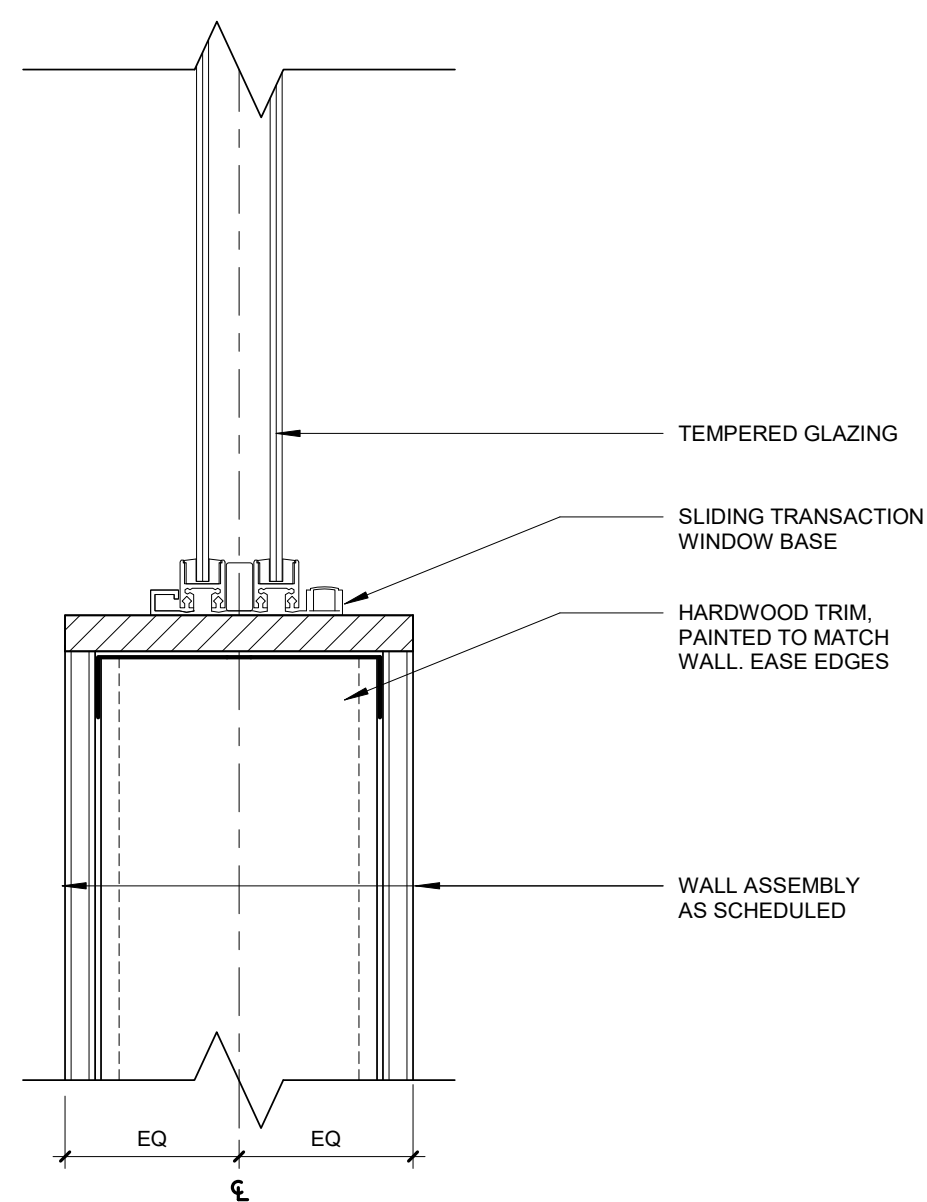
1 BASE CABINET 4 DRAWERS
1 1/2" = 1'-0"



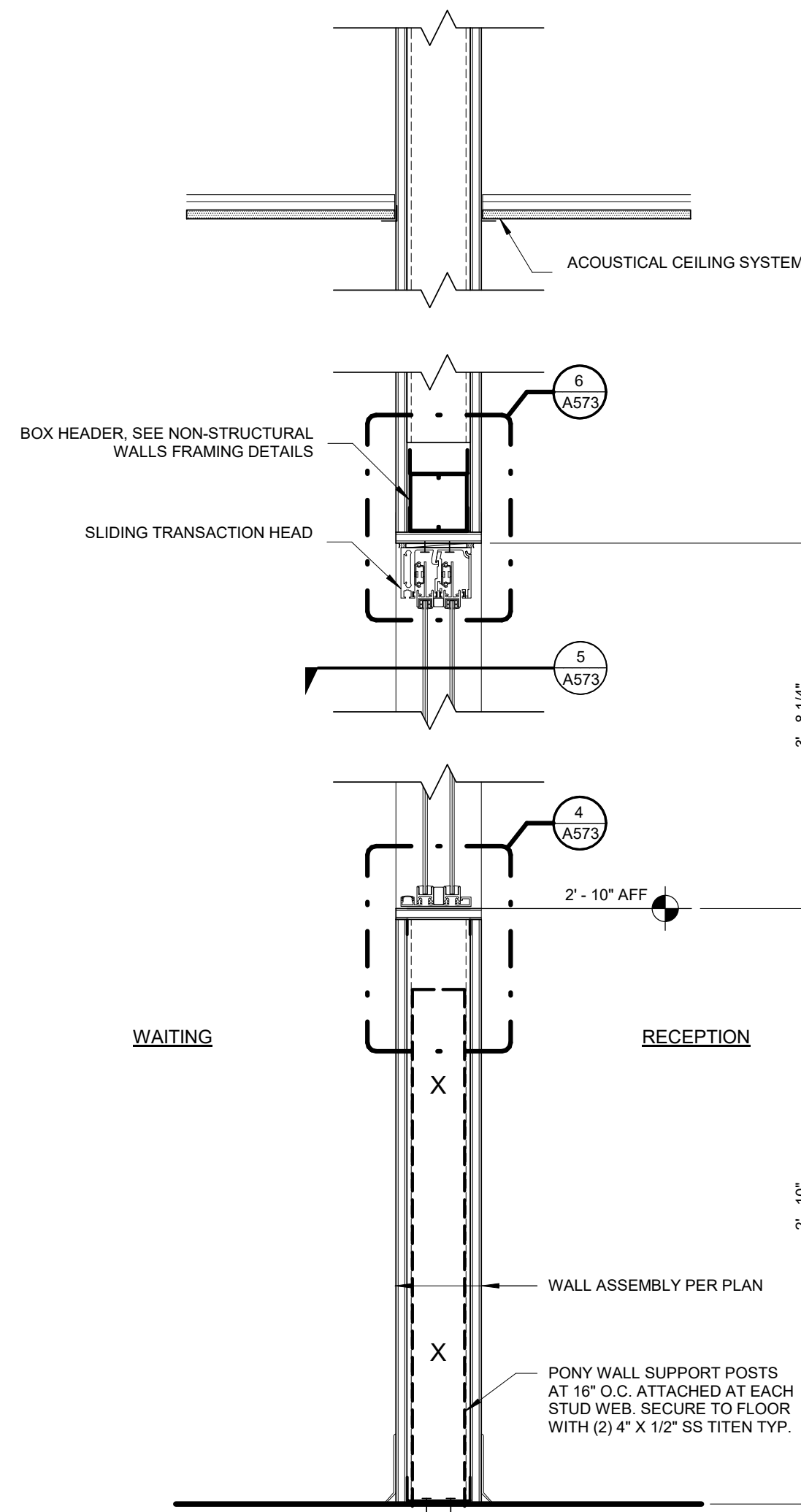
6 SLIDING TRANSACTION WINDOW HEAD
3" = 1'-0"



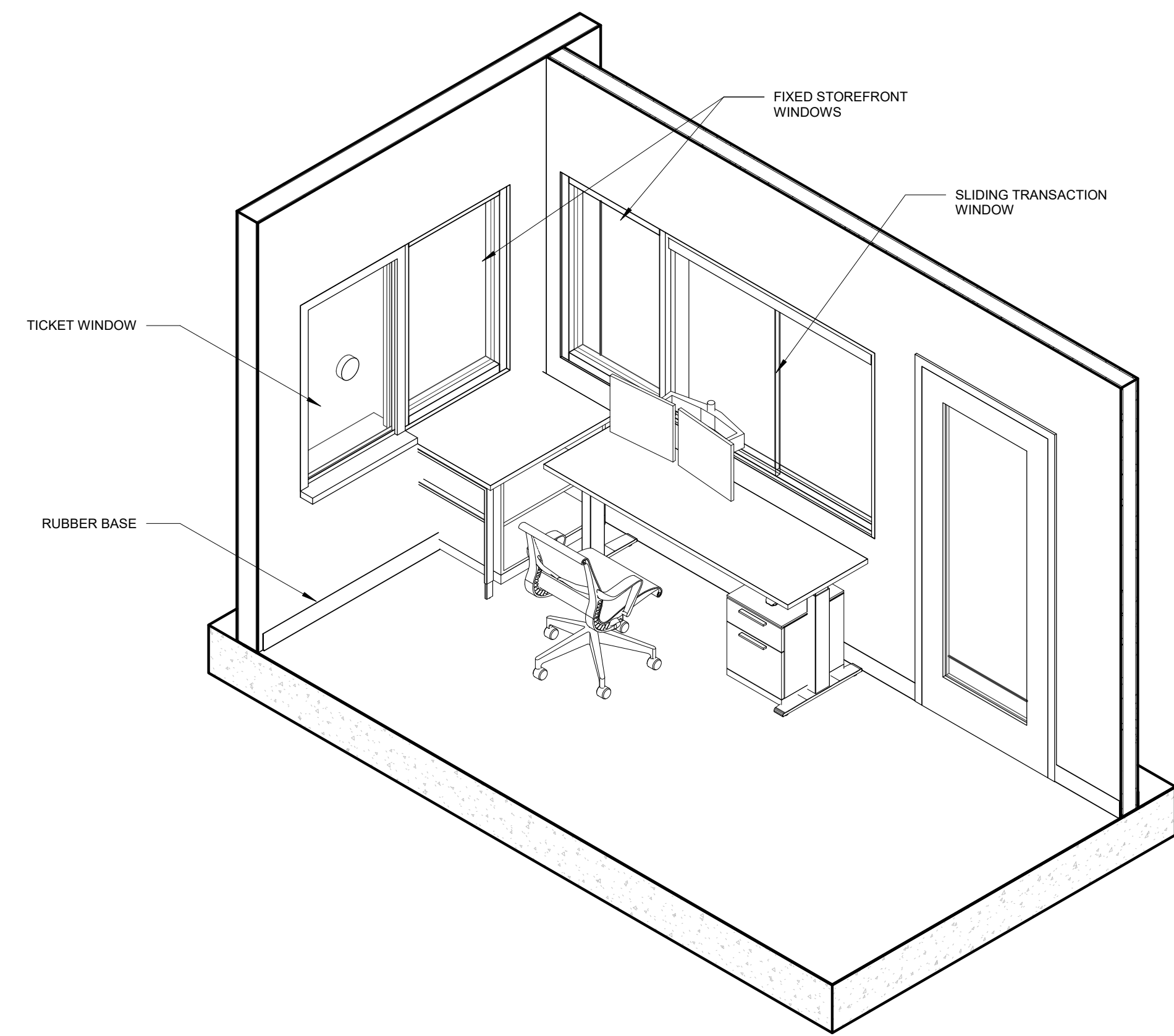
5 SLIDING TRANSACTION WINDOW JAMB
3" = 1'-0"



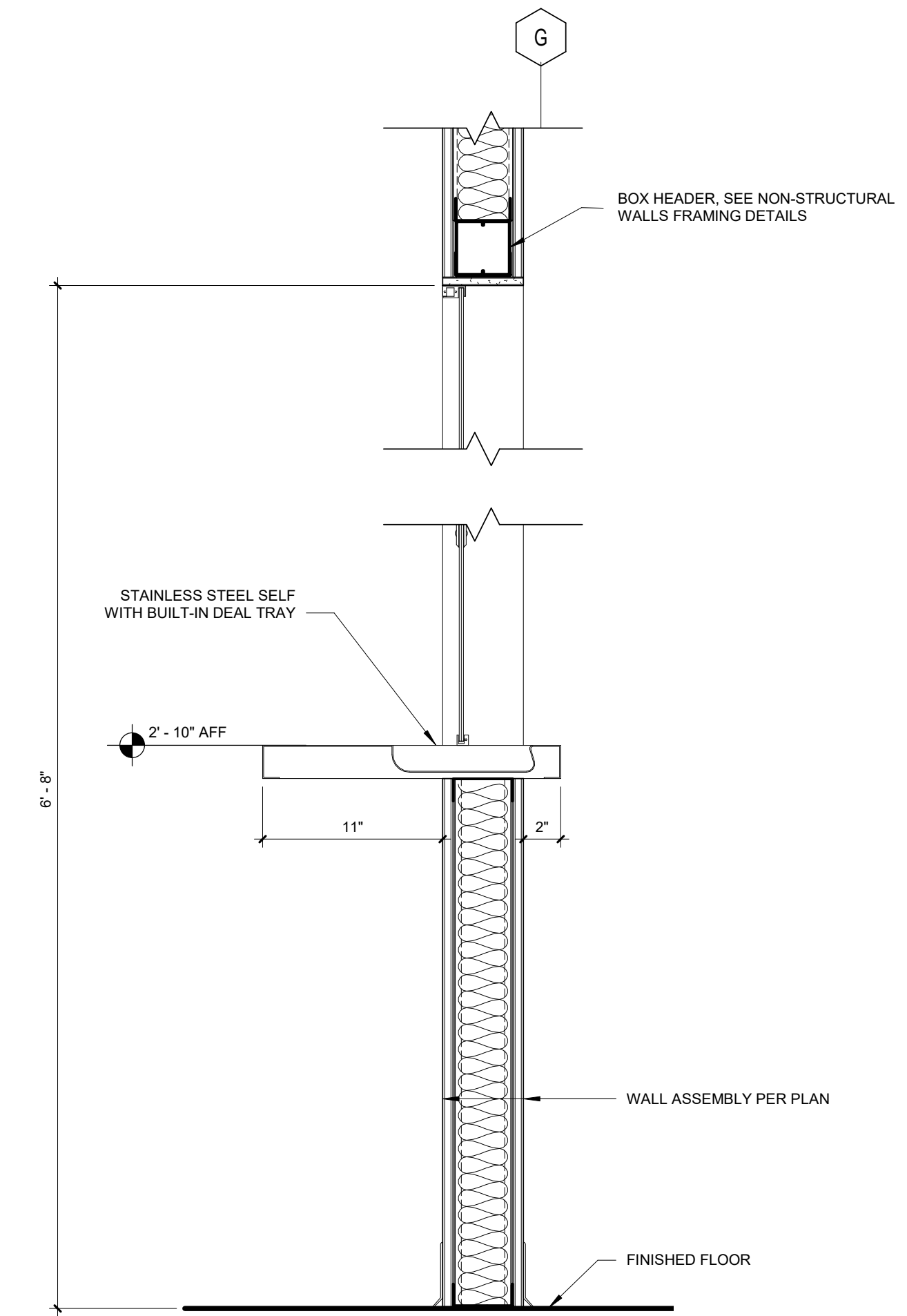
4 SLIDING TRANSACTION WINDOW SILL
3" = 1'-0"



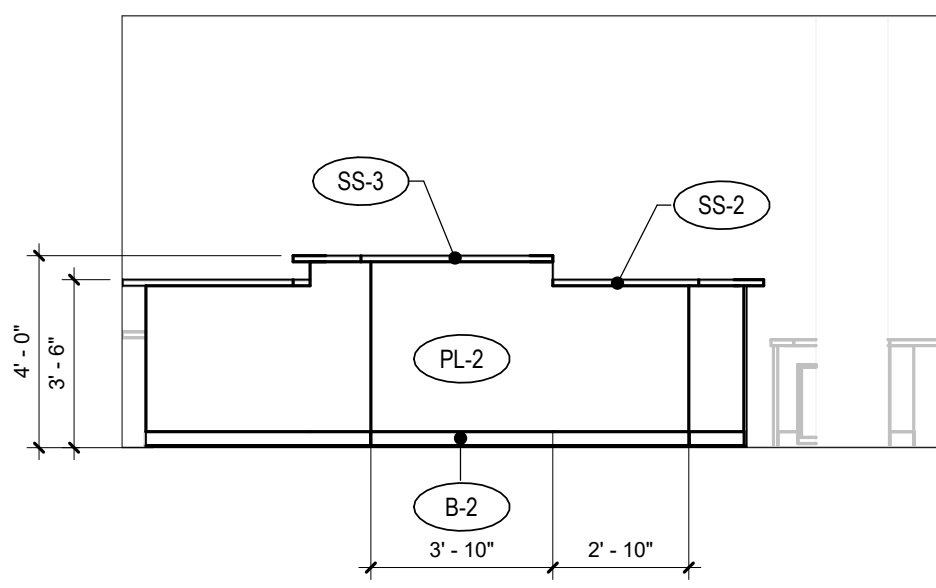
3 RECEPTION - SLIDING TRANSACTION WINDOW
1 1/2" = 1'-0"



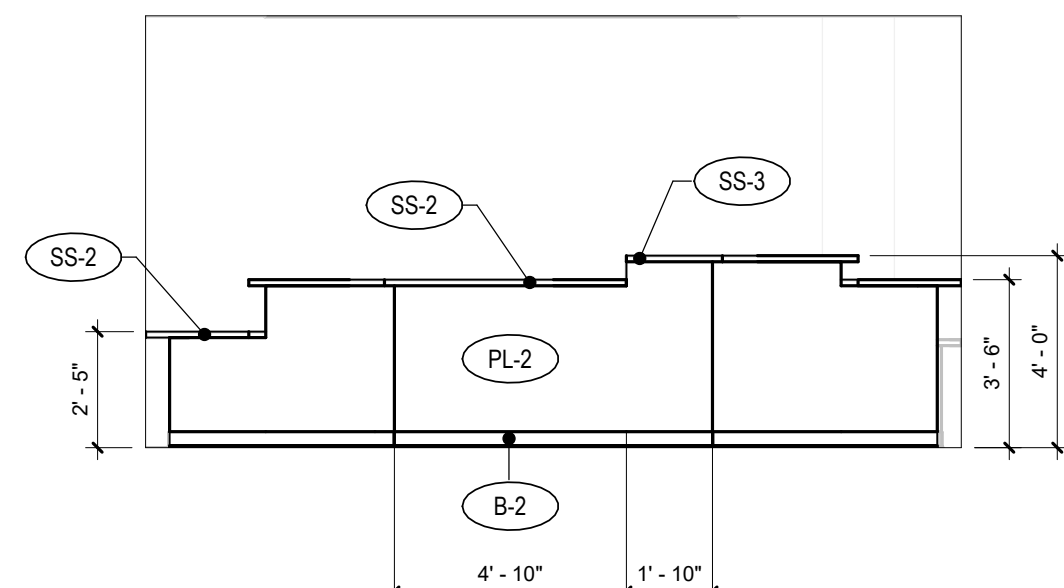
2 ENLARGED AXON - RECEPTION



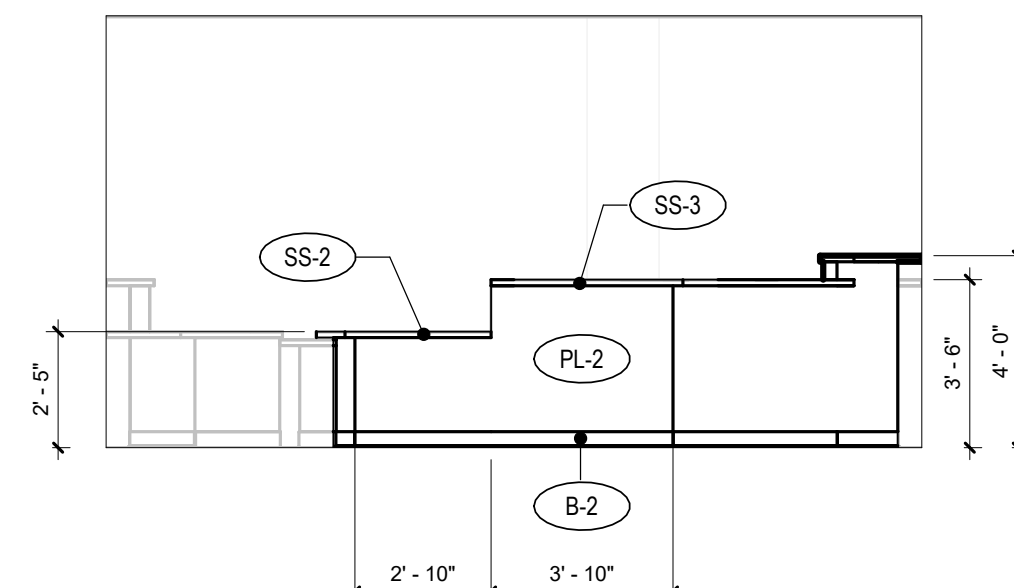
1 RECEPTION - TICKET WINDOW
1 1/2" = 1'-0"



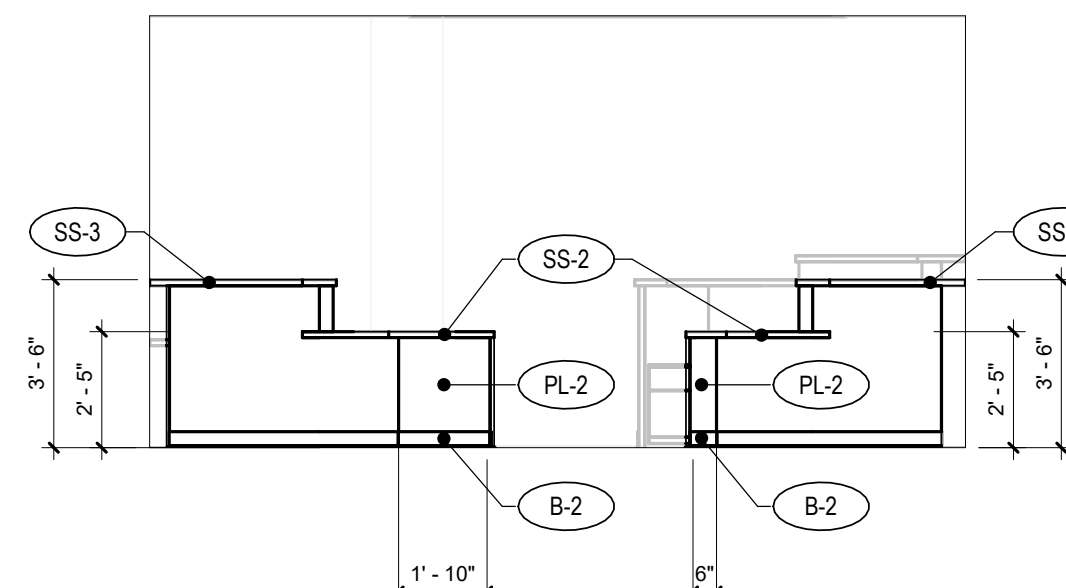
15 CIRCULATION DESK - FRONT N
1/4" = 1'-0"



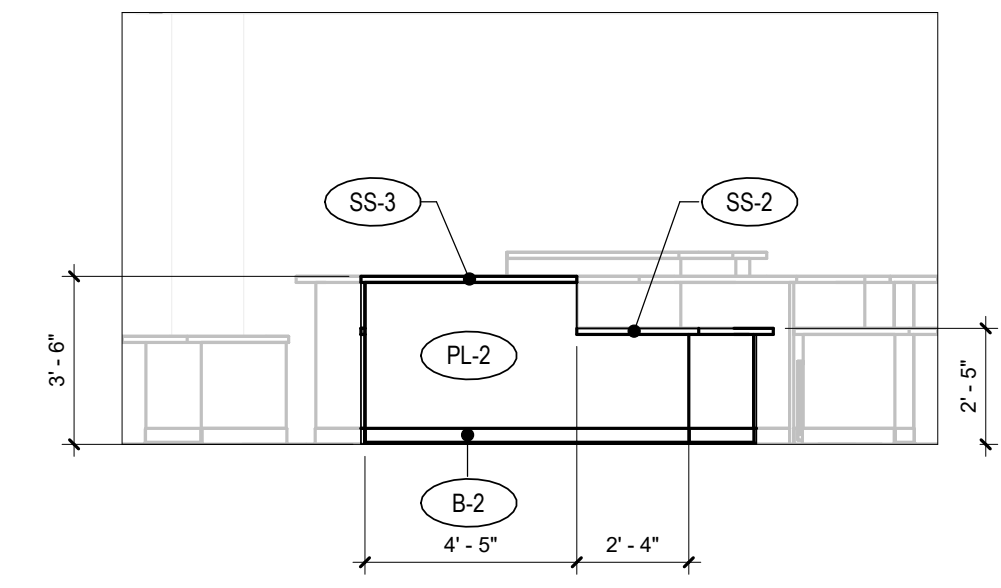
11 CIRCULATION DESK - FRONT NE
1/4" = 1'-0"



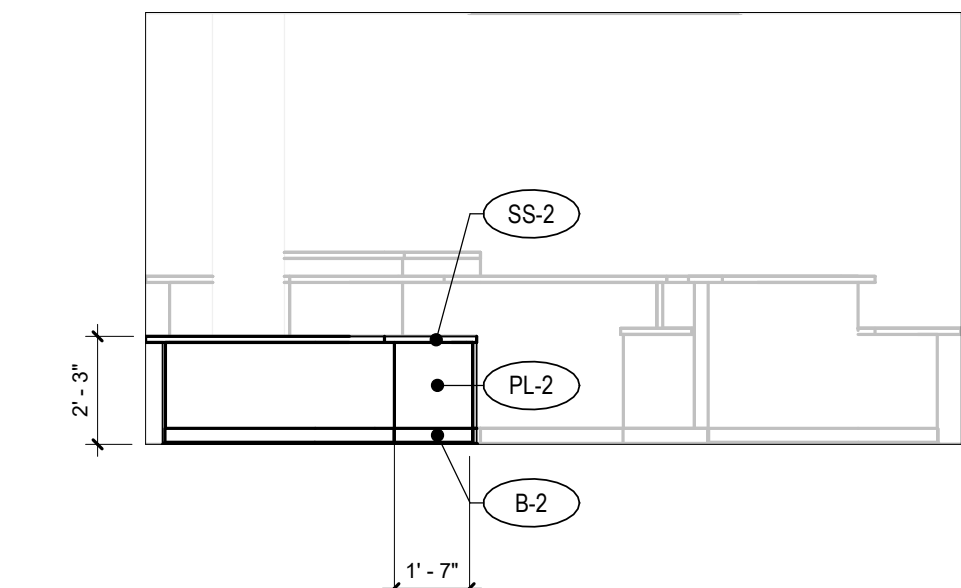
8 CIRCULATION DESK - FRONT E
1/4" = 1'-0"



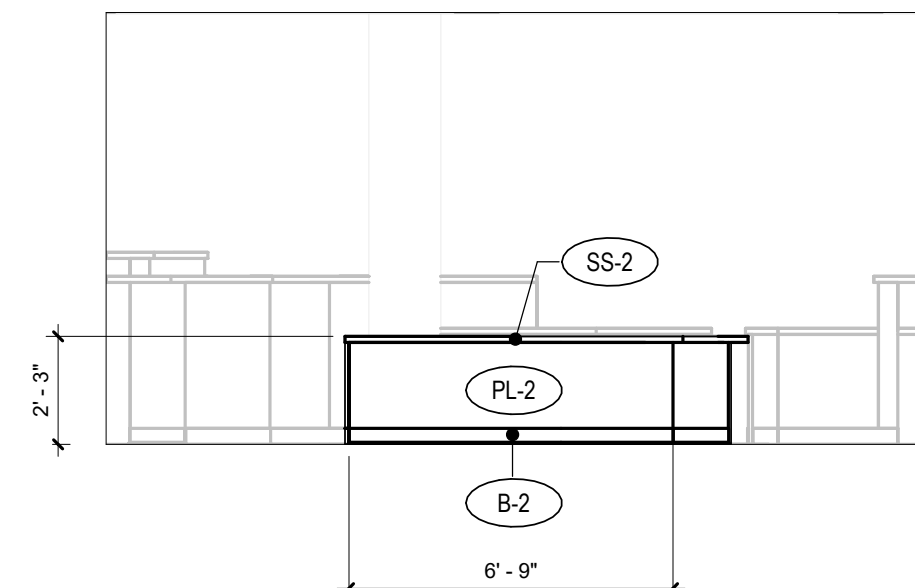
4 CIRCULATION DESK - FRONT SE
1/4" = 1'-0"



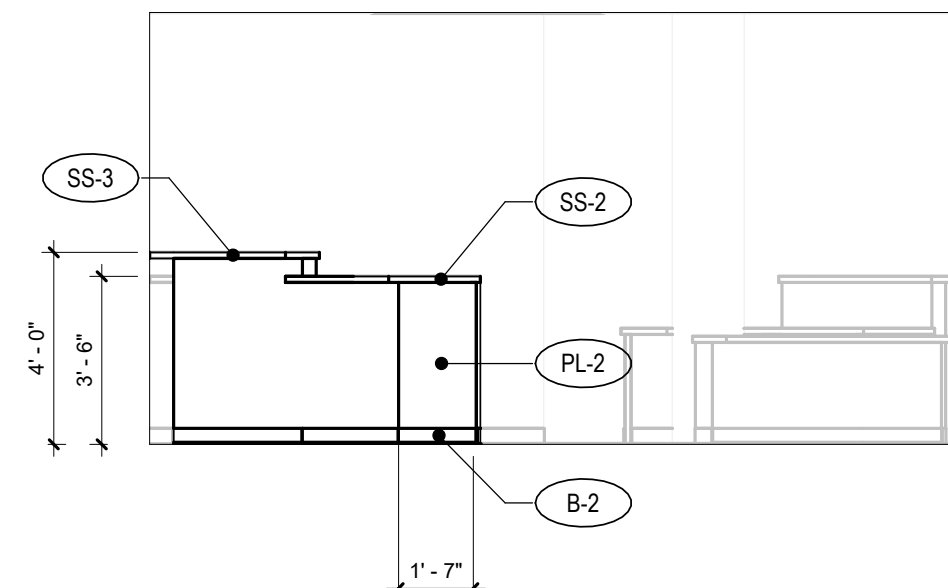
14 CIRCULATION DESK - FRONT S
1/4" = 1'-0"



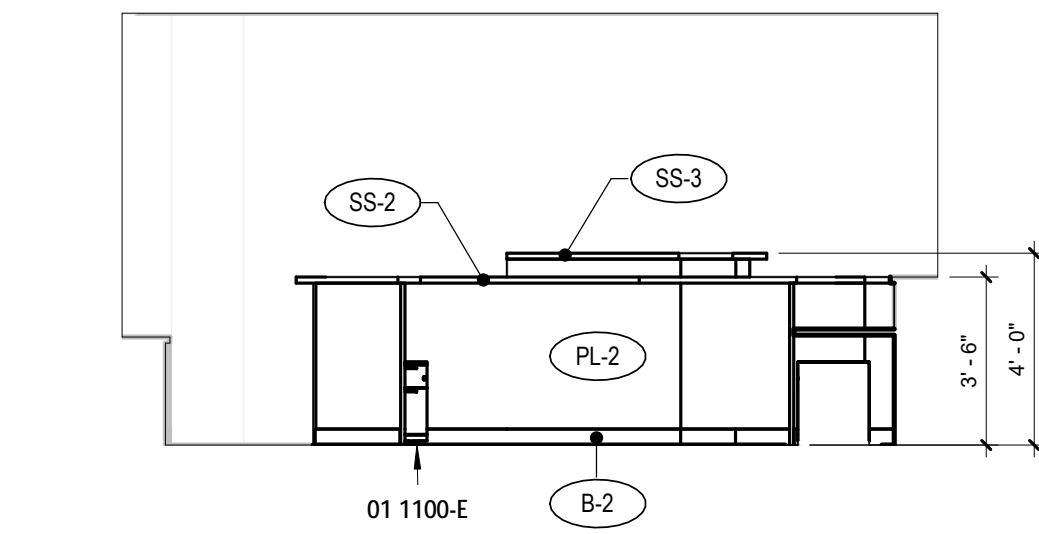
10 CIRCULATION DESK - FRONT SW
1/4" = 1'-0"



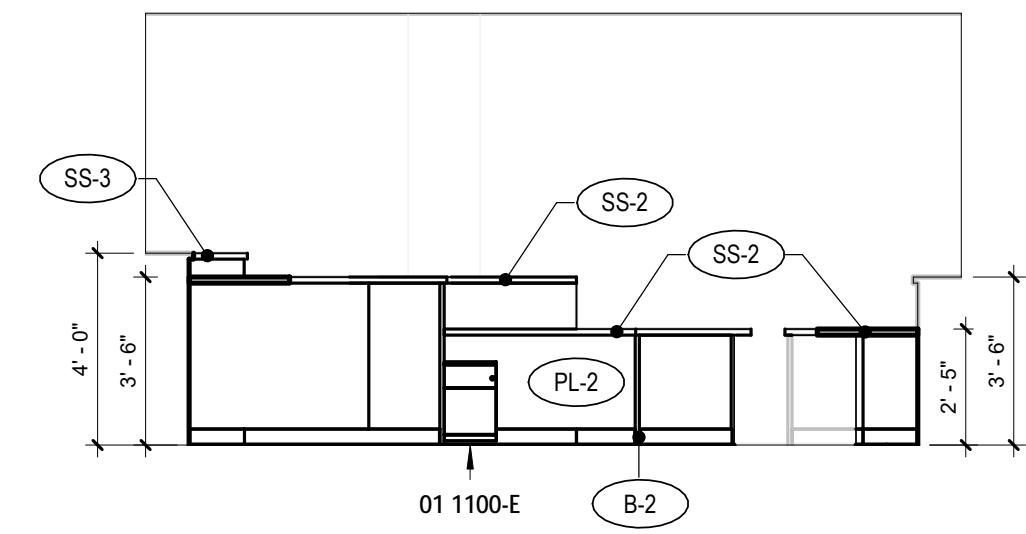
7 CIRCULATION DESK - FRONT W
1/4" = 1'-0"



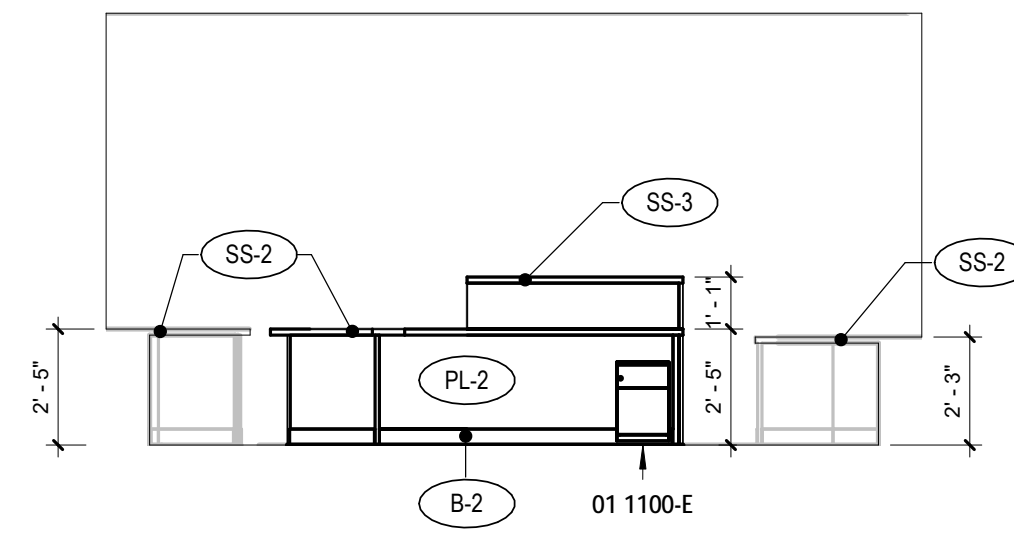
3 CIRCULATION DESK - FRONT NW
1/4" = 1'-0"



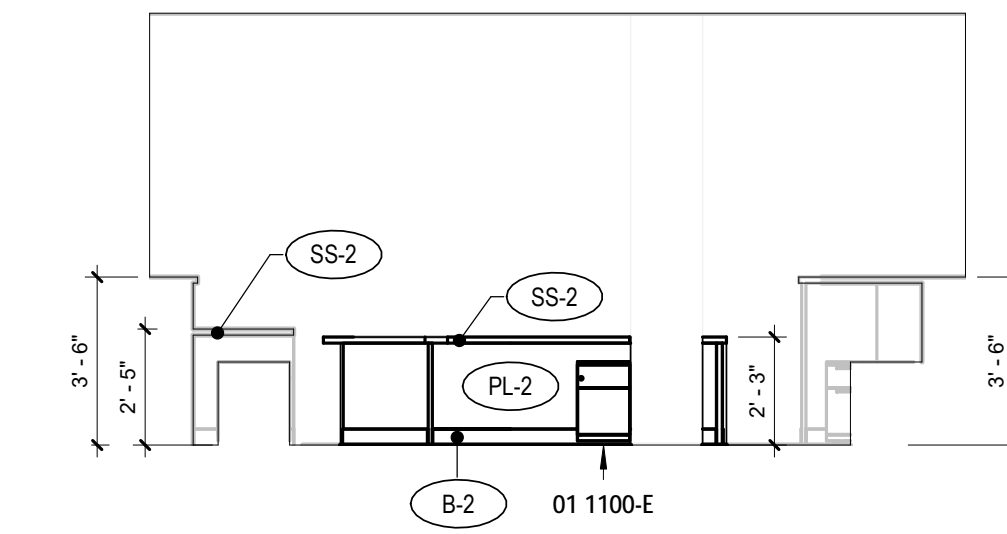
13 CIRCULATION DESK - BACK N
1/4" = 1'-0"



9 CIRCULATION DESK - BACK E
1/4" = 1'-0"



6 CIRCULATION DESK - BACK S
1/4" = 1'-0"



2 CIRCULATION DESK - BACK W
1/4" = 1'-0"

GENERAL NOTES - INTERIOR ELEVATION

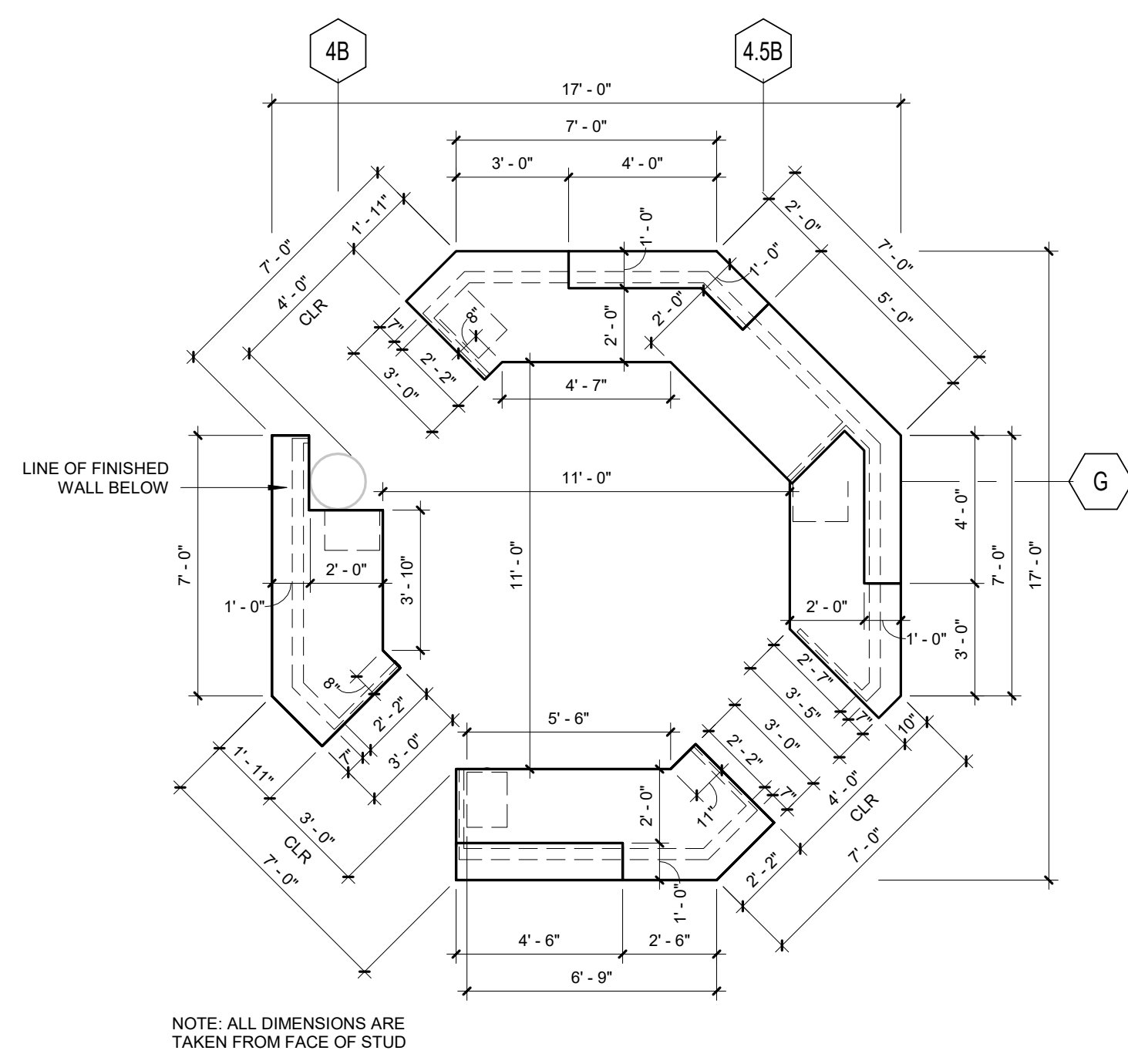
- A. SEE FINISH PLANS FOR CORNER GUARD LOCATIONS.
- B. INTERIOR ELEVATIONS ARE DRAWN IN TRUE DIMENSIONS, U.N.O. (I.E. ANGLED, CURVED)
- C. SEE PROJECT MANUAL, FINISH PLANS, REFLECTED CEILING PLANS, INTERIOR ELEVATIONS, AND INTERIOR FINISH LEGEND FOR ADDITIONAL FINISH INFORMATION
- D. SEE DOOR AND FRAME TYPES FOR ADDITIONAL FINISH INFORMATION AND REFERENCE TO DETAILS. DOOR SWINGS INDICATED BY DASHED LINES SHOWN ON ELEVATIONS ARE FOR REFERENCE ONLY.
- E. PROVIDE BLOCKING AND BACKING FOR ALL WALL-MOUNTED EQUIPMENT AND FIXTURES TO BE FURNISHED BY THE CONTRACTOR OR OWNER.
- F. SEE ALSO ELECTRICAL, MECHANICAL, PLUMBING, AND TECHNOLOGY DRAWINGS FOR ADDITIONAL WALL MOUNTED EQUIPMENT AND FIXTURES.

KEYNOTES - SPECIFICATION

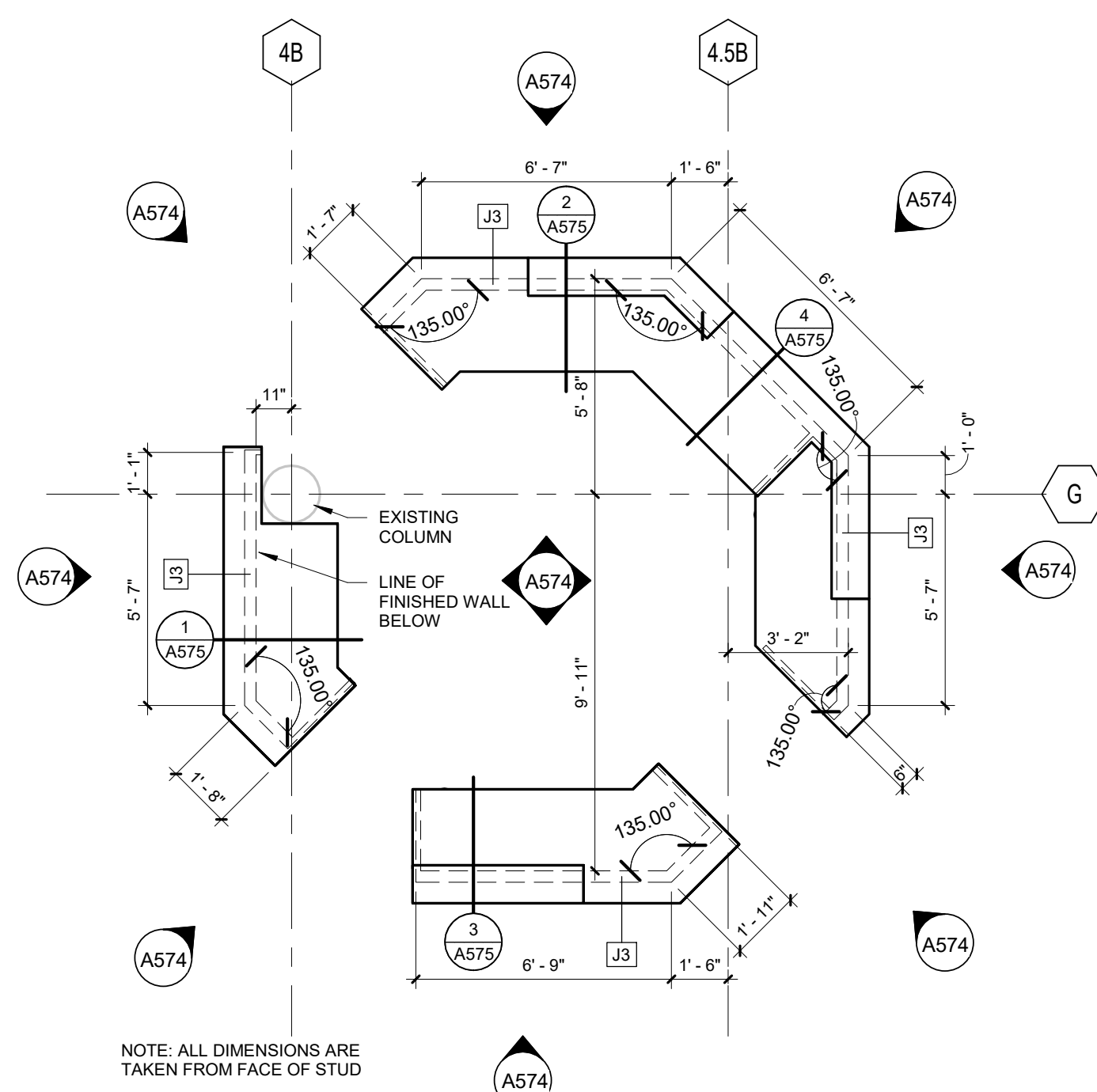
01 1100-E MOBILE CABINET, OFOI

FINISH TAG

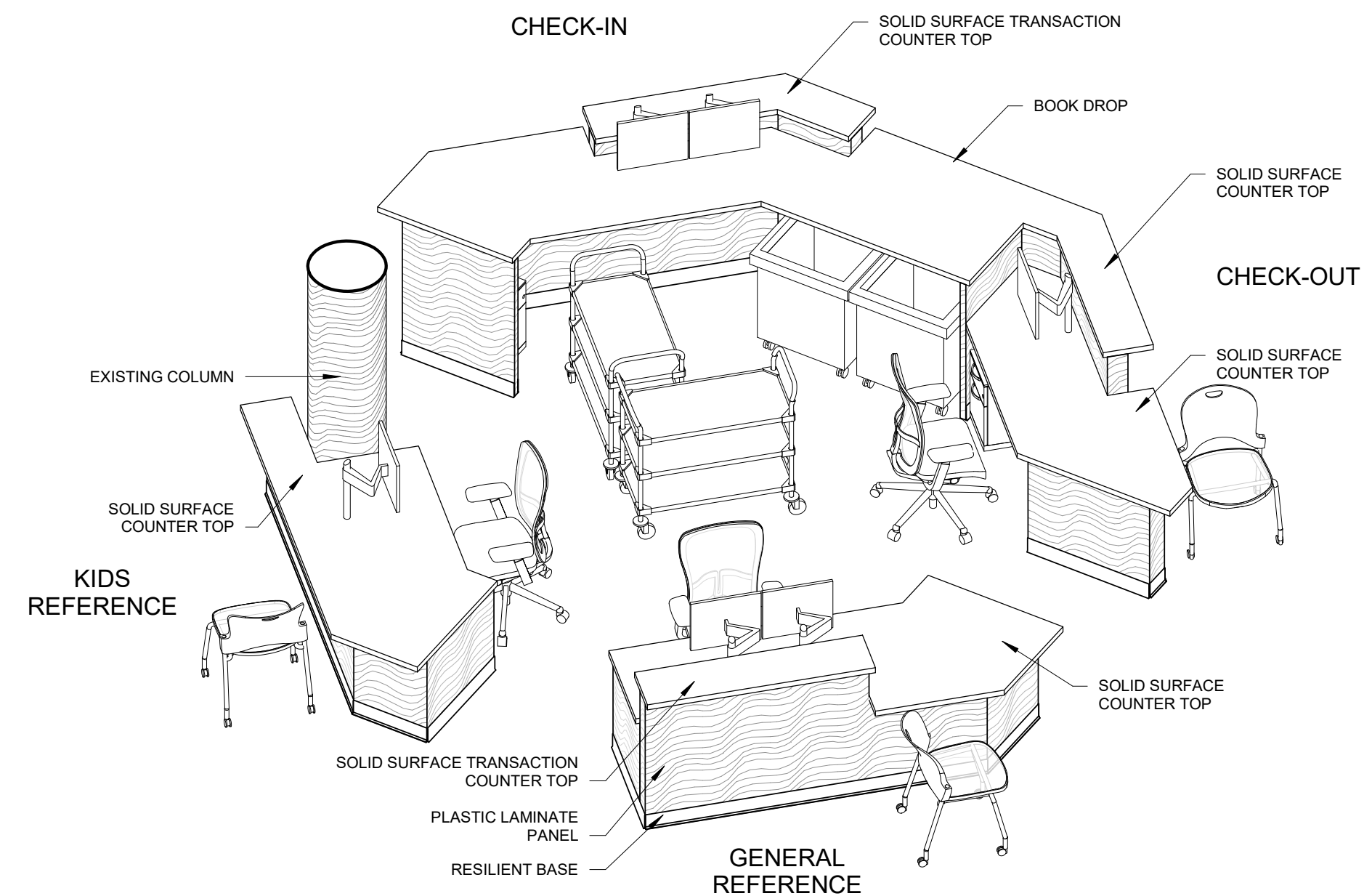
(B-2)	4" RUBBER BASE	(PT-6)	PAINT COLOR - TYPE 6 ACCENT
(FA-1)	UPHOLSTRY FABRIC - TYPE 1	(PT-7)	PAINT COLOR - TYPE 7 ACCENT
(FA-2)	UPHOLSTRY FABRIC - TYPE 2	(PT-8)	PAINT COLOR - TYPE 8 ACCENT
(FA-3)	UPHOLSTRY FABRIC - TYPE 3	(SS-2)	SOLID SURFACE TYPE - 2
(PL-2)	PLASTIC LAMINATE TYPE - 2	(SS-3)	SOLID SURFACE TYPE - 3
(PT-1)	PAINT COLOR - TYPE 1 WHITE	(WD-1)	WOOD CEILING PANELS TYPE - 1
(PT-5)	PAINT COLOR - TYPE 5 WHITE	(WP-1)	WOOD WALL PANEL TYPE - 1



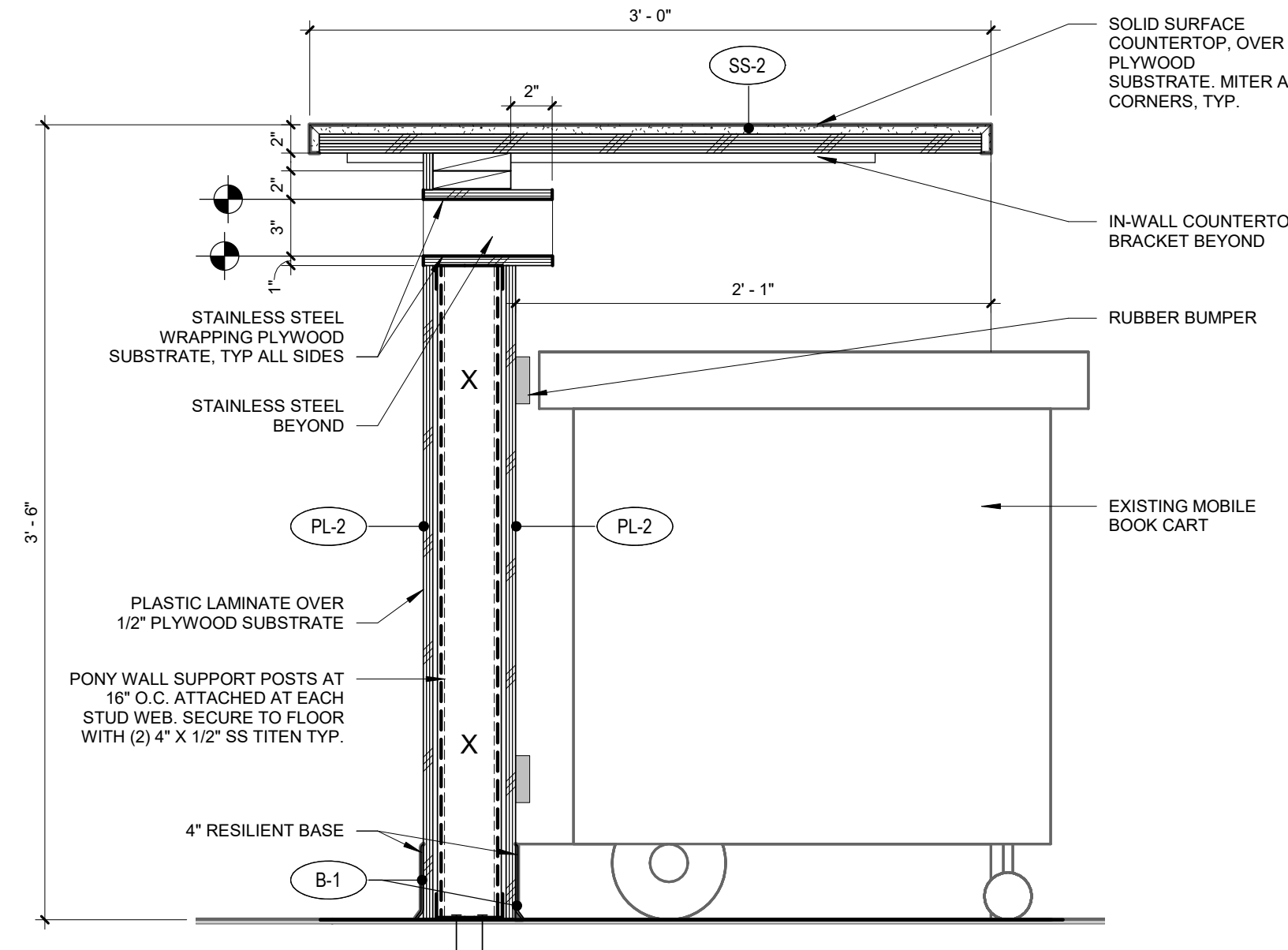
12 ENLARGED PLAN - COUNTERTOP DIMENSIONS
1/4" = 1'-0"



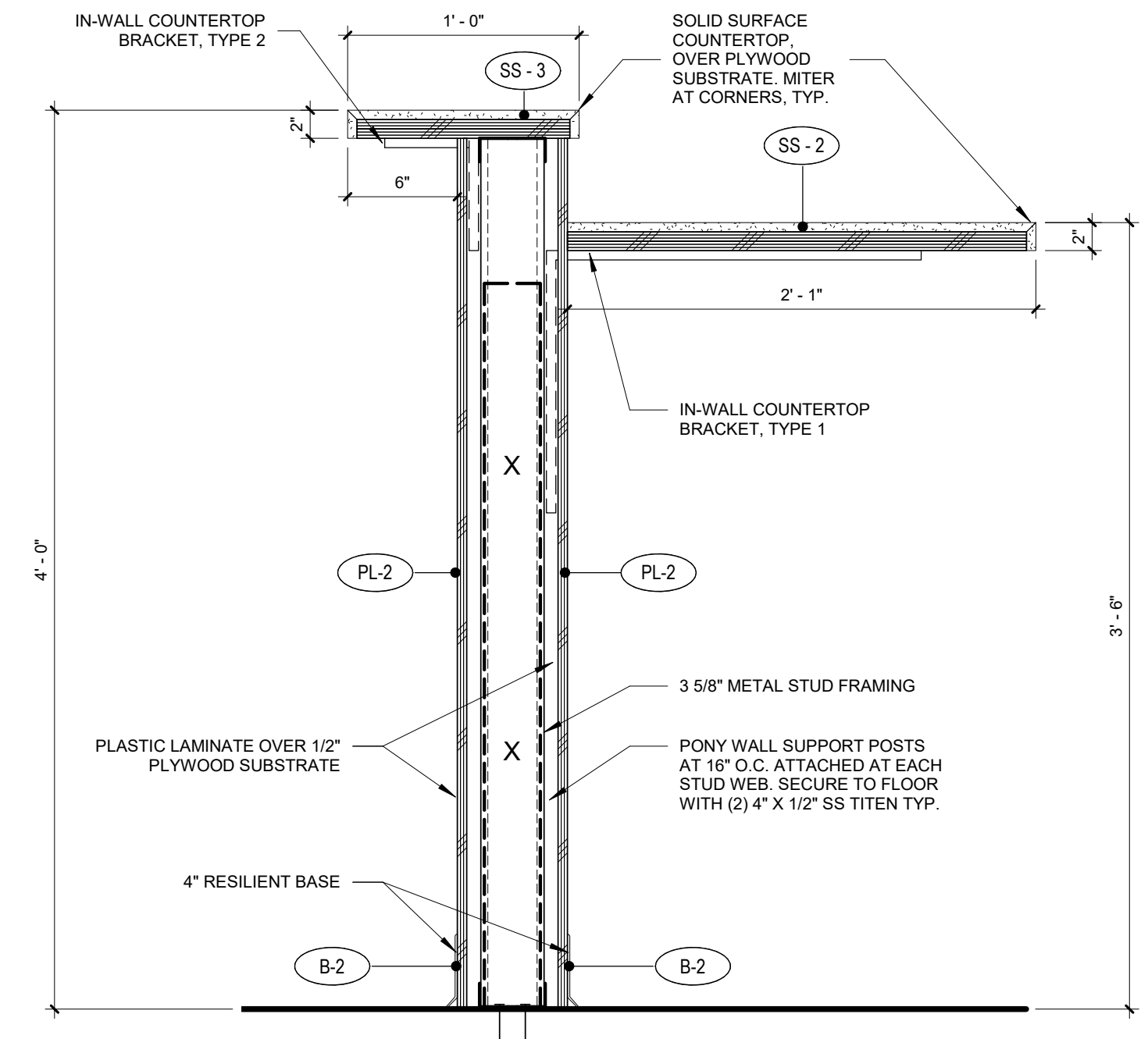
5 ENLARGED PLAN - CIRCULATION DESK
1/4" = 1'-0"



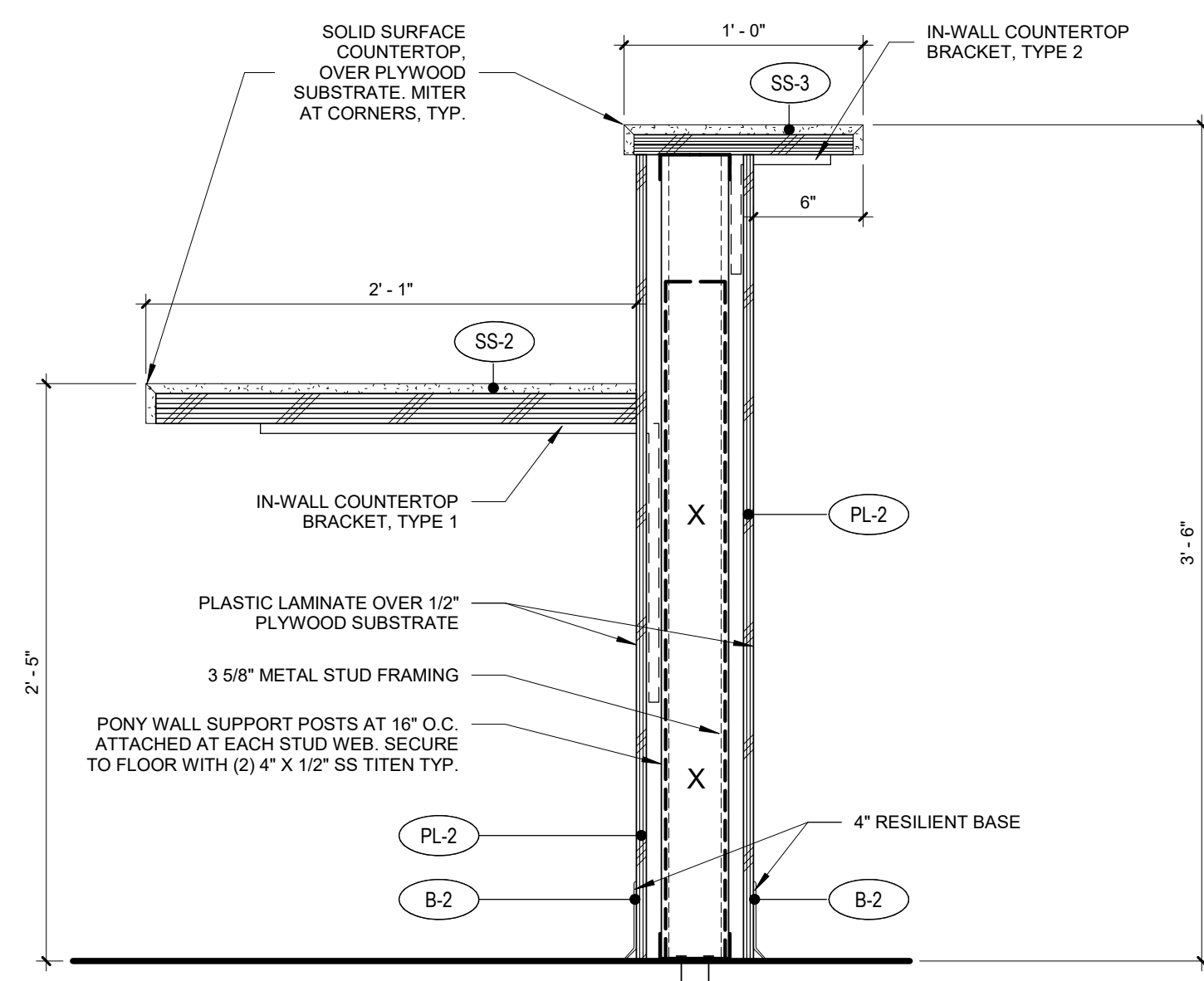
1 ENLARGED AXON - CIRCULATION DESK



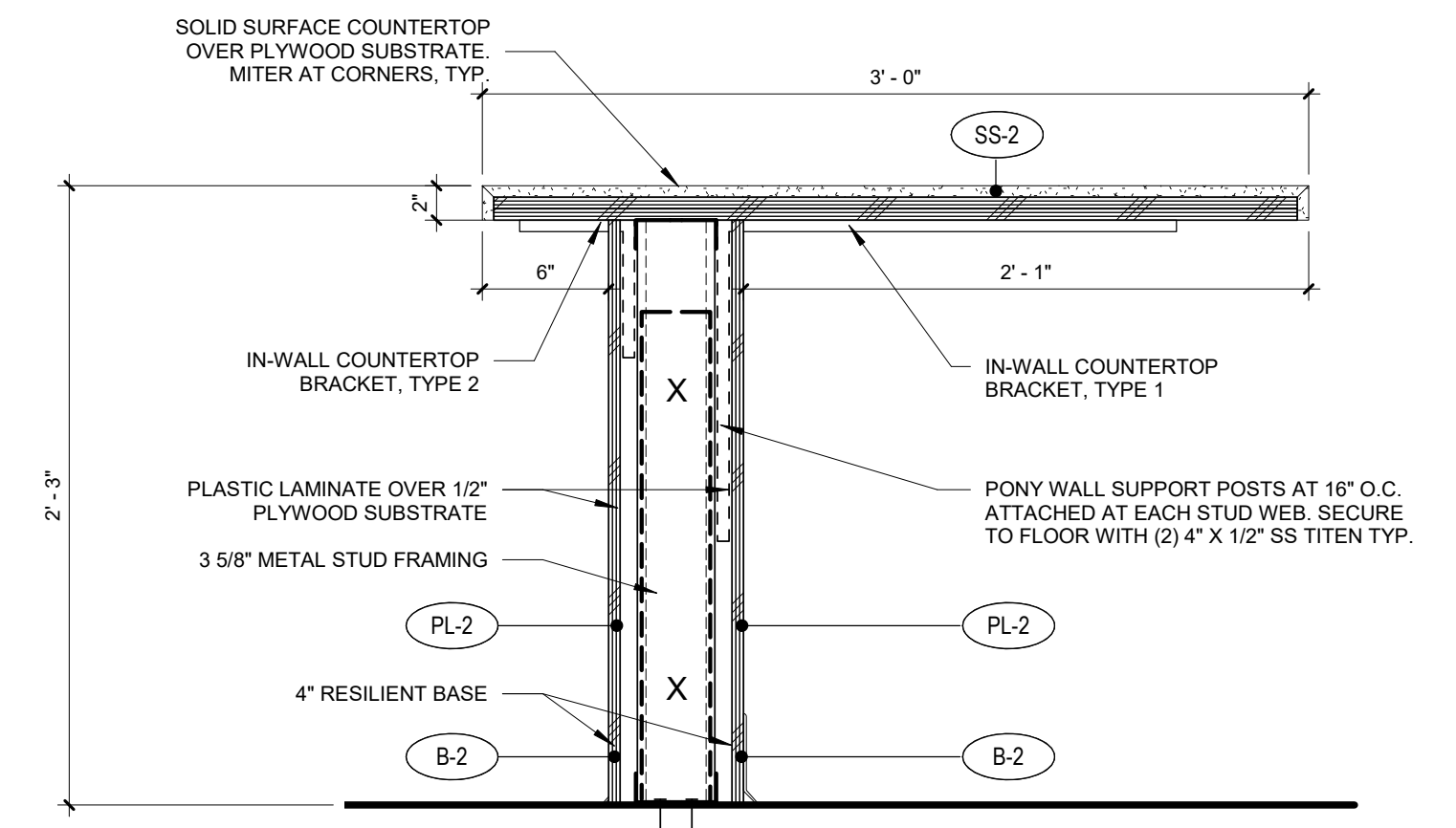
4 SECTION AT BOOK DROP
1 1/2" = 1'-0"



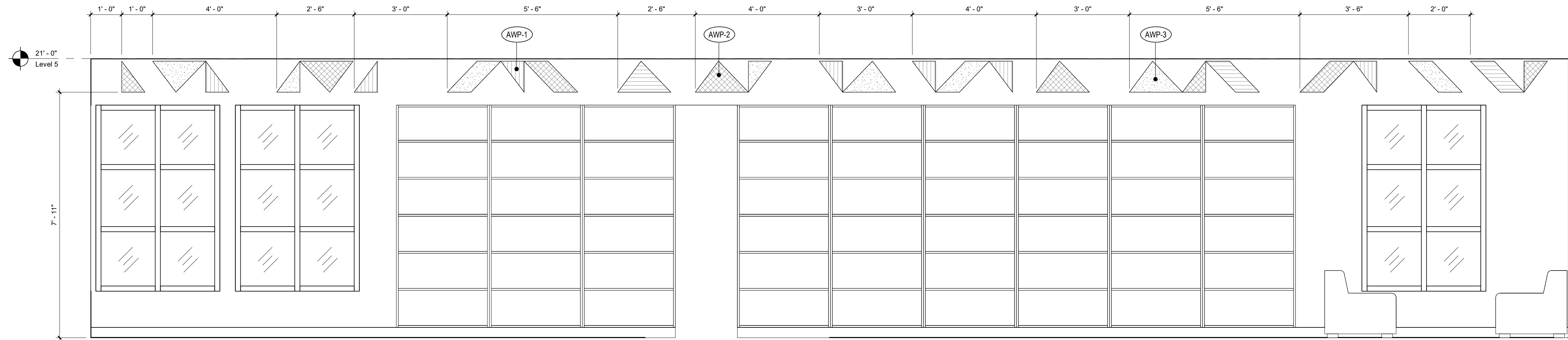
2 SECTION AT CHECK-IN
1 1/2" = 1'-0"



3 SECTION AT GENERAL REFERENCE
1 1/2" = 1'-0"

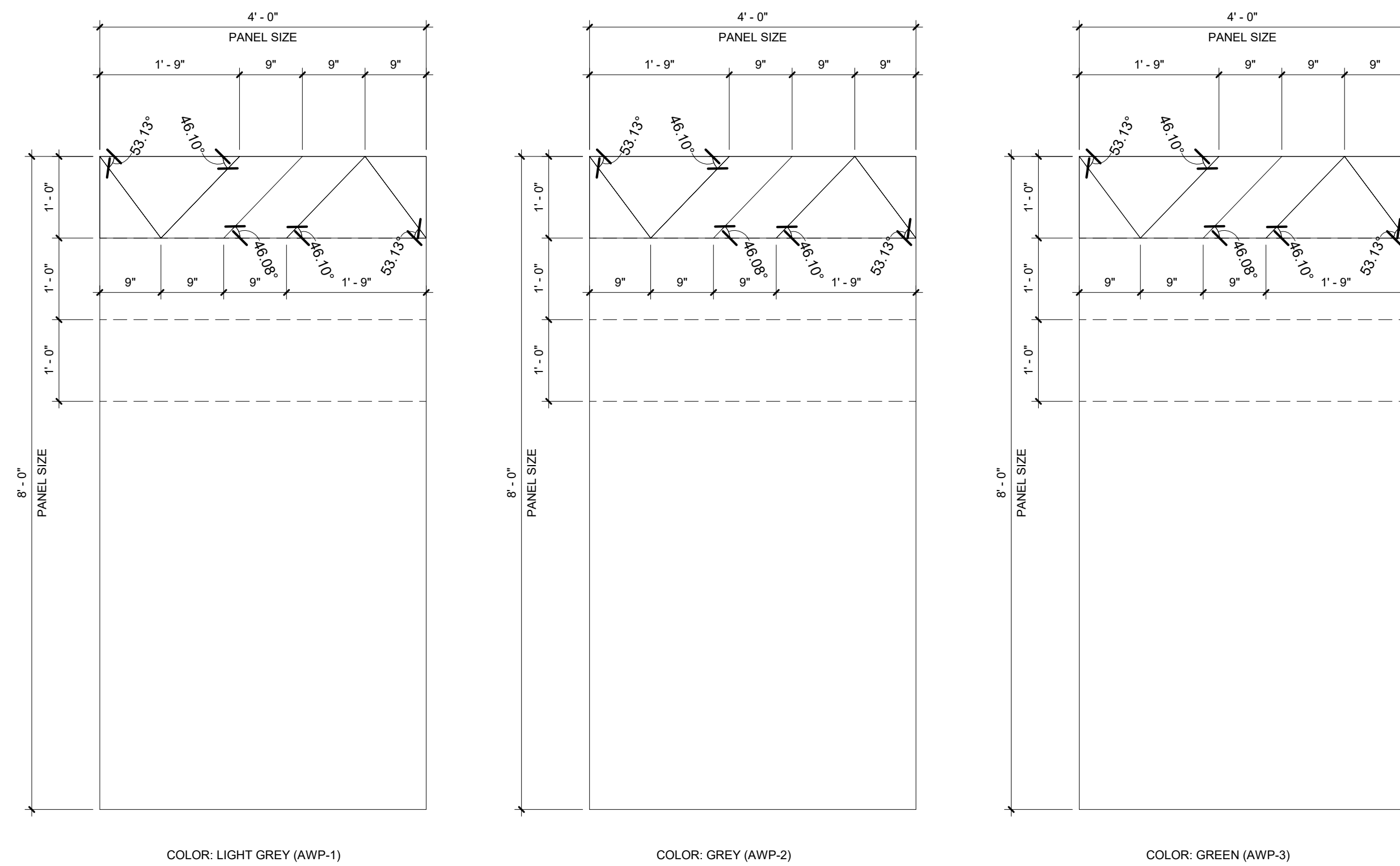


1 SECTION AT KIDS REFERENCE
1 1/2" = 1'-0"

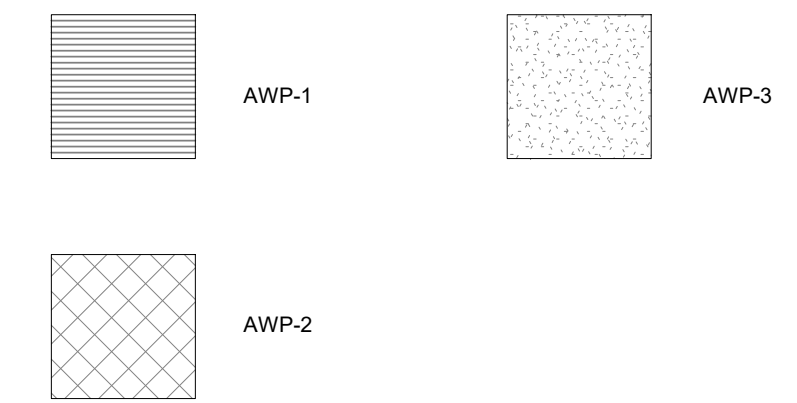


2 TEEN AREA - ACOUSTICAL WALL PANELS

1/2" = 1'-0"



ACOUSTICAL WALL PANEL LEGEND



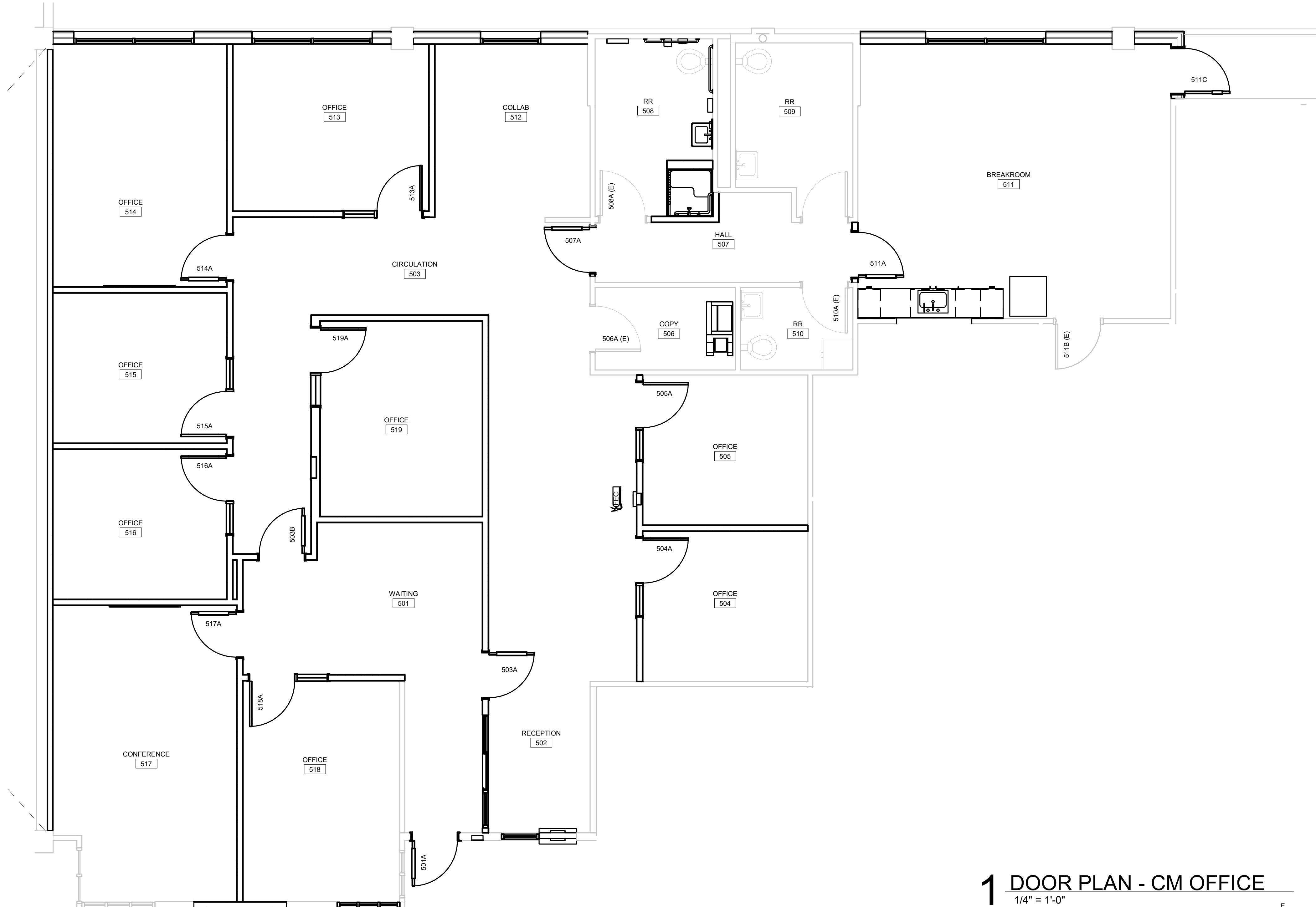
1 ACOUSTICAL WALL PANEL - CUTTING PATTERN

3/4" = 1'-0"

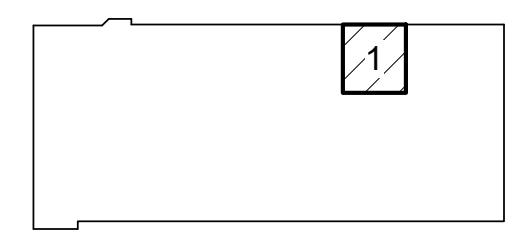
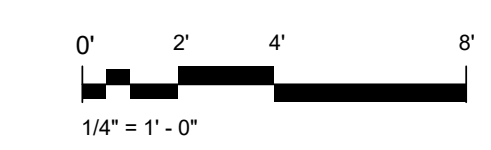
GENERAL NOTES - DOOR SCHEDULES

- A. ALL DOORS FINISHED U.N.O.
- B. VERIFY INTERNAL DOOR FRAME DIMENSIONS MATCH WALL THICKNESS DIMENSIONS.
- C. PAINT NEW HM DOOR FRAMES TO MATCH EXISTING.

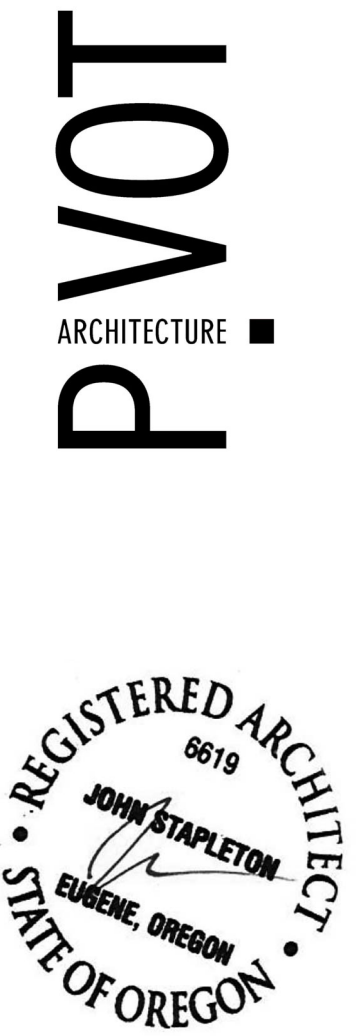
DOOR SCHEDULE - CMO													
MARK	FROM: ROOM	TO: ROOM	WIDTH	HEIGHT	FIRE RATING	DOOR PANEL			FRAME			ACCESS CONTROL	COMMENTS
						TYPE	MATERIAL	FINISH	TYPE	MATERIAL	FINISH		
501A	WAITING	LOBBY	3'-0"	7'-0"		A4	(E)	(E)	HM01	HM	PT	Y	REUSE SALVAGED DOOR PANEL
503A	WAITING	CIRCULATION	3'-0"	7'-0"		A4	WD	FAC	HM01	HM	PT	Y	
503B	WAITING	CIRCULATION	3'-0"	7'-0"		A4	WD	FAC	HM01	HM	PT	Y	
504A	CIRCULATION	OFFICE	3'-0"	7'-0"		A1	WD	FAC	HM02	HM	PT		
505A	CIRCULATION	OFFICE	3'-0"	7'-0"		A1	WD	FAC	HM02	HM	PT		
507A	HALL	CIRCULATION	3'-0"	7'-0"		A4	WD	FAC	HM01	HM	PT		
511A	HALL	BREAKROOM	3'-0"	7'-0"		A4	WD	FAC	HM01	HM	PT		
511C	BREAKROOM	EXTERIOR	3'-0"	7'-0"		A2	AL	FAC	HM01	AL	NA	Y	
513A	CIRCULATION	OFFICE	3'-0"	7'-0"		A1	WD	FAC	HM02	HM	PT		
514A	CIRCULATION	OFFICE	3'-0"	7'-0"		A4	WD	FAC	HM01	HM	PT		
515A	CIRCULATION	OFFICE	3'-0"	7'-0"		A1	WD	FAC	HM02	HM	PT		
516A	CIRCULATION	OFFICE	3'-0"	7'-0"		A1	WD	FAC	HM02	HM	PT		
517A	WAITING	CONFERENCE	3'-0"	7'-0"		A4	WD	FAC	HM01	HM	PT		
518A	WAITING	OFFICE	3'-0"	7'-0"		A1	WD	FAC	HM02	HM	PT		
519A	CIRCULATION	OFFICE	3'-0"	7'-0"		A1	WD	FAC	HM02	HM	PT		



1 DOOR PLAN - CM OFFICE
1/4" = 1'-0"



KEYPLAN



CONSTRUCTION DRAWINGS
SPRINGFIELD CITY HALL RENOVATION
 PROJECT #: 2125.00
 CITY OF SPRINGFIELD
 225 5TH STREET SPRINGFIELD, OR 97477

SHEET TITLE:
DOOR SCHEDULE - CM OFFICE

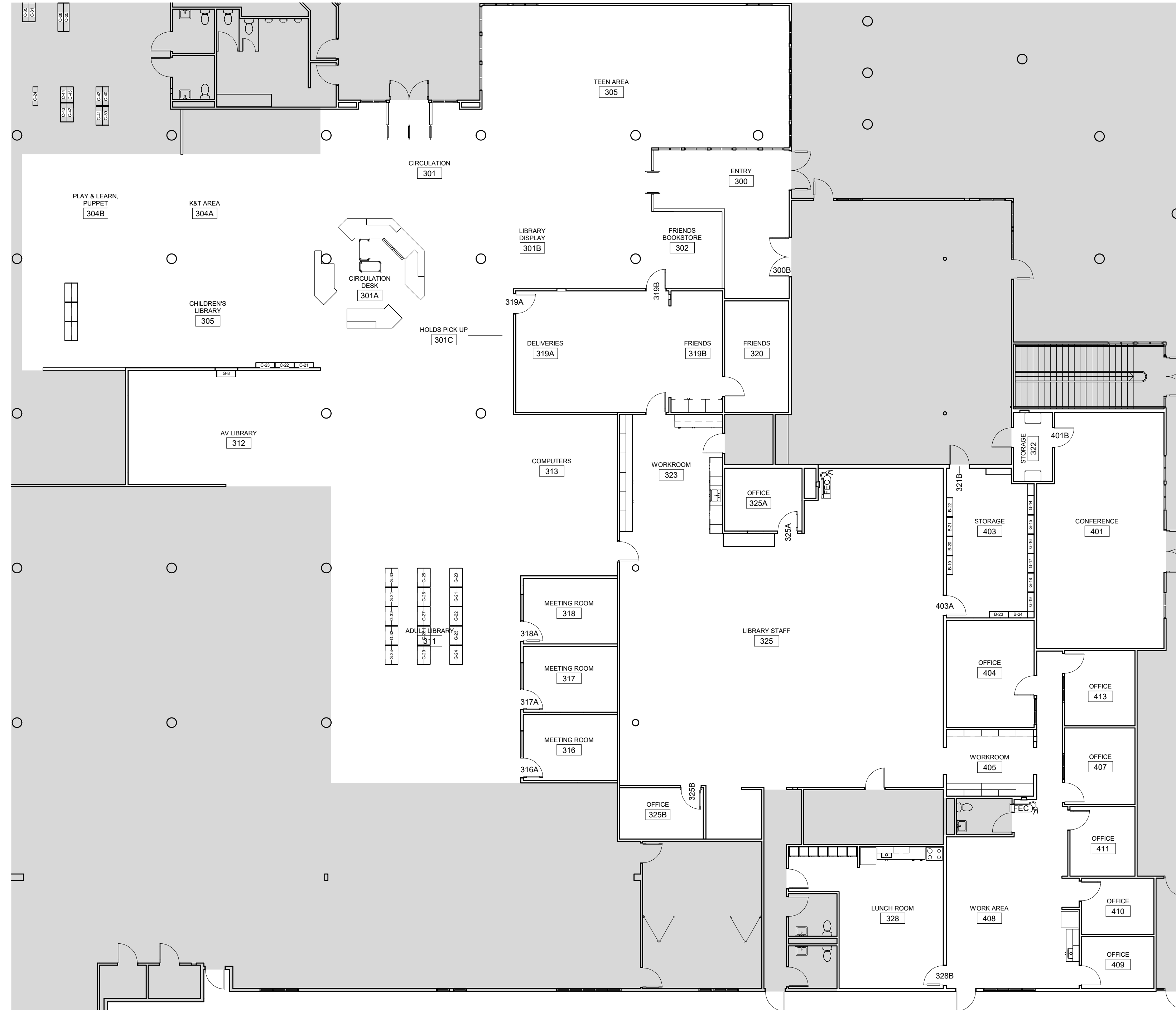
REVISIONS:
 # DESCRP. DATE

ISSUE DATE: 09.28.2023

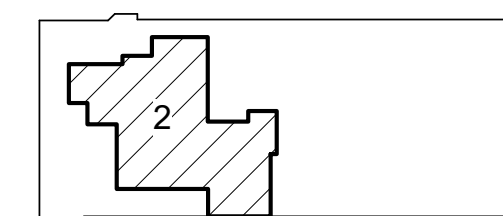
A601

- A. ALL DOORS FINISHED U.N.O.
- B. VERIFY INTERNAL DOOR FRAME DIMENSIONS MATCH WALL THICKNESS DIMENSIONS.
- C. PAINT NEW HM DOOR FRAMES TO MATCH EXISTING.

DOOR SCHEDULE - Library													
MARK	FROM: ROOM	TO: ROOM	WIDTH	HEIGHT	FIRE RATING	DOOR PANEL			FRAME			ACCESS CONTROL	COMMENTS
						TYPE	MATERIAL	FINISH	TYPE	MATERIAL	FINISH		
300B	MEETING ROOM	ENTRY	6' - 0"	7' - 0"		C1	WD	FAC	HM01	HM	PT		
316A	ADULT LIBRARY	MEETING ROOM	3' - 0"	7' - 0"		A4	WD	FAC	HM03	HM	PT		
317A	ADULT LIBRARY	MEETING ROOM	3' - 0"	7' - 0"		A4	WD	FAC	HM03	HM	PT		
318A	ADULT LIBRARY	MEETING ROOM	3' - 0"	7' - 0"		A4	WD	FAC	HM03	HM	PT		
319A	HOLDS PICK UP	DELIVERIES	3' - 0"	7' - 0"		A1	WD	FAC	HM01	HM	PT		
319B	DELIVERIES	FRIENDS BOOKSTORE	3' - 0"	7' - 0"		A1	WD	FAC	HM01	HM	PT		
321B	STORAGE	MEETING ROOM	3' - 0"	7' - 0"		A1	WD	FAC	HM01	HM	PT		
325A	LIBRARY STAFF	OFFICE	3' - 0"	7' - 0"		A4	WD	FAC	HM01	HM	PT		
325B	LIBRARY STAFF	OFFICE	3' - 0"	7' - 0"		A4	WD	FAC	HM01	HM	PT		
328B	WORK AREA	LUNCH ROOM	3' - 0"	7' - 0"		A4	WD	FAC	HM01	HM	PT		
401B	STORAGE	CONFERENCE	3' - 0"	7' - 0"		A1	WD	FAC	HM01	HM	PT		
403A	LIBRARY STAFF	STORAGE	3' - 0"	7' - 0"		A1	WD	FAC	HM01	HM	PT		



1 DOOR PLAN - LIBRARY
3/32" = 1'-0"



KEYPLAN

CONSTRUCTION DRAWINGS
SPRINGFIELD CITY HALL RENOVATION
PROJECT #: 2125.00
CITY OF SPRINGFIELD
225 5TH STREET SPRINGFIELD, OR 97477

SHEET TITLE:
DOOR SCHEDULE - LIBRARY

REVISIONS:

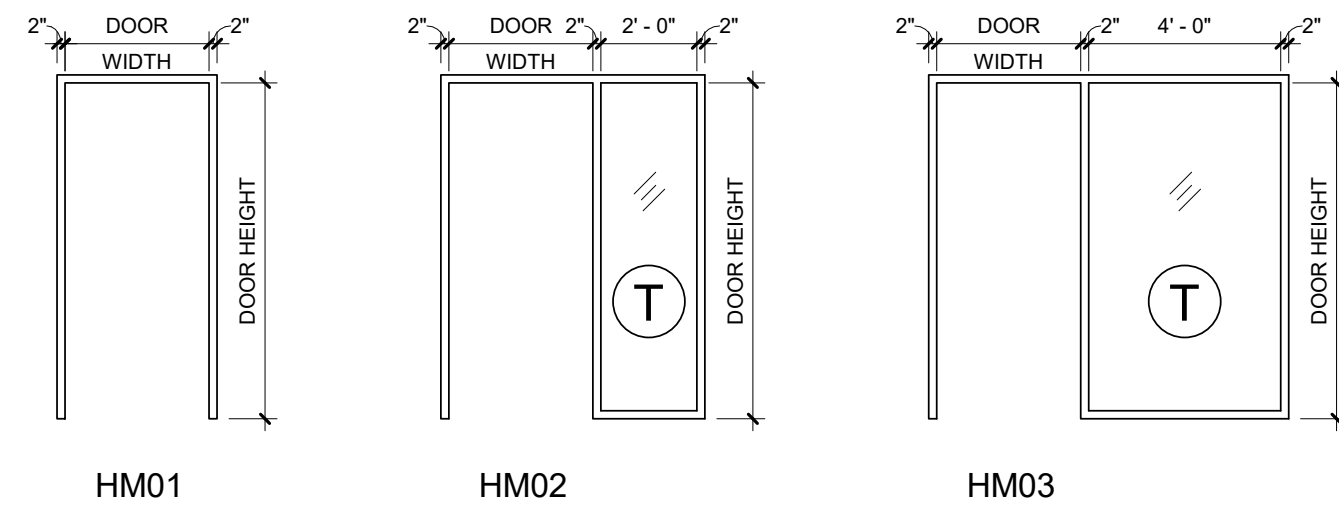
#	DESCRIP.	DATE

ISSUE DATE: 09.28.2023

A602

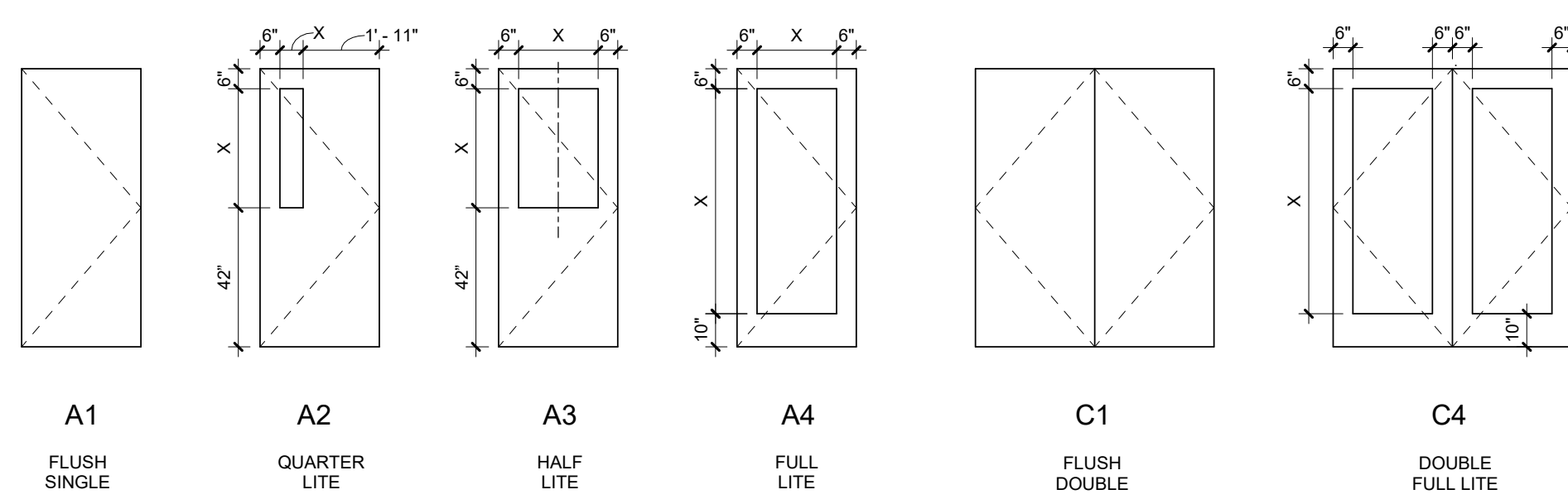
FRAME ELEVATIONS (FOR WINDOWS AND DOORS)

HOLLOW METAL FRAMES



DOOR LEGEND

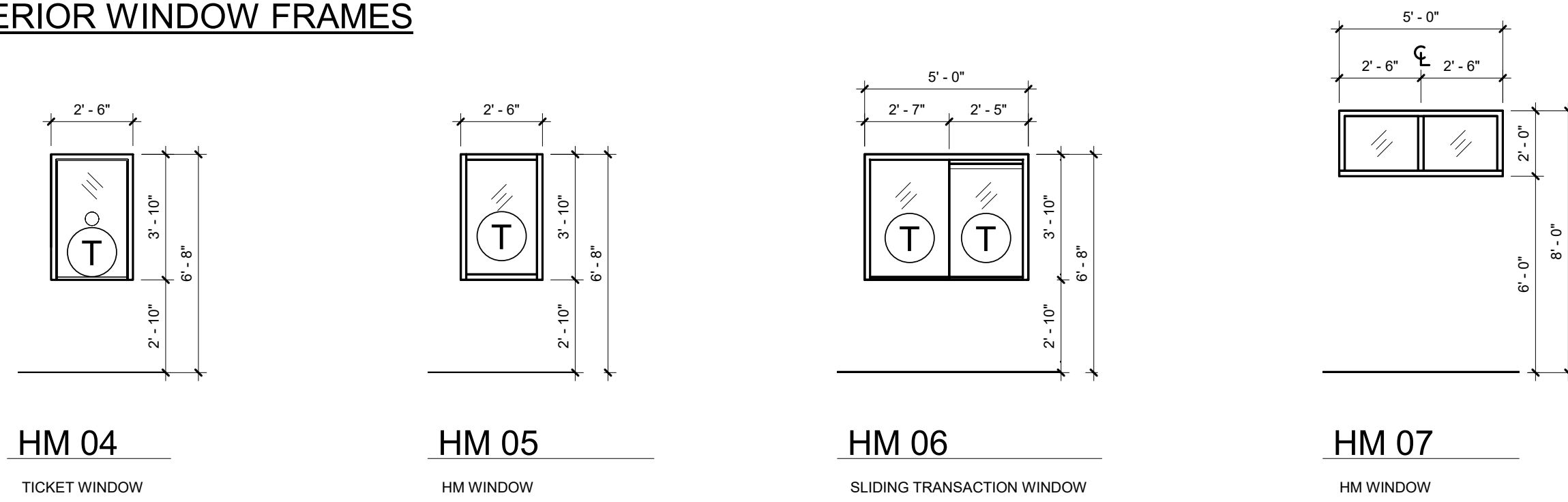
DOOR PANEL TYPES



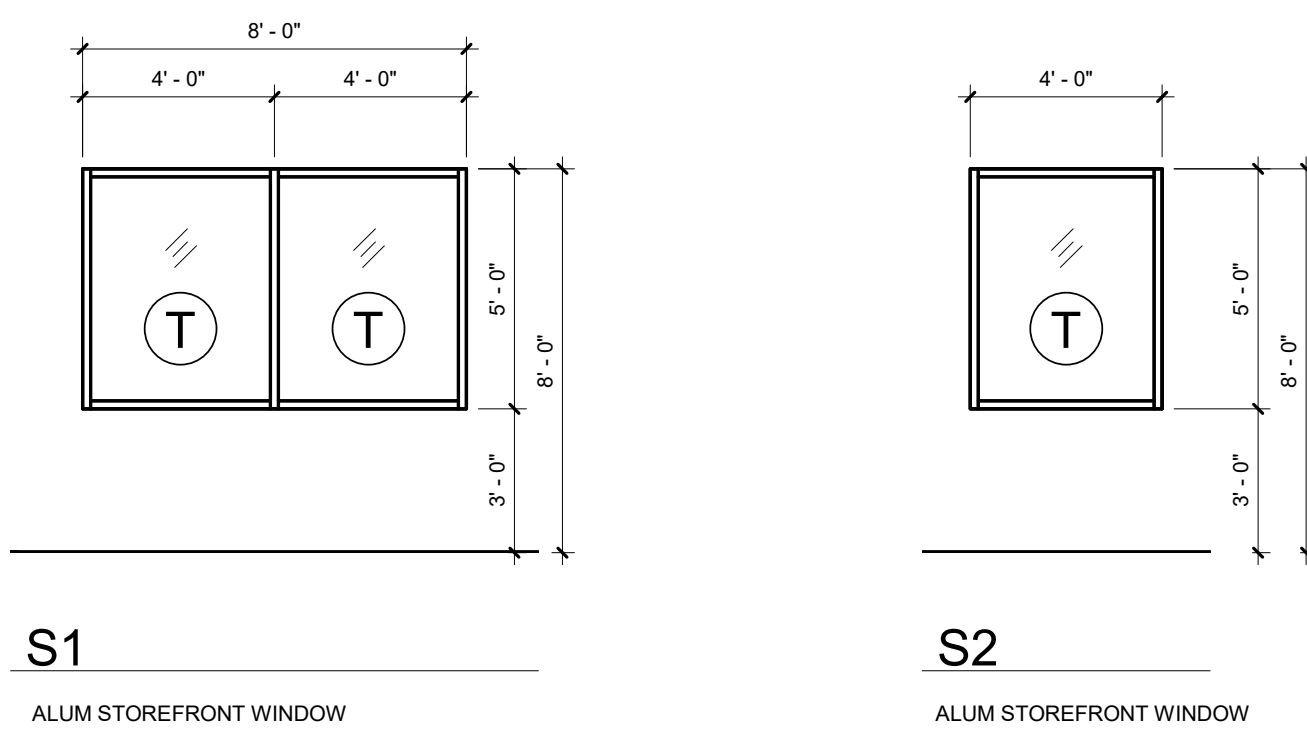
GLAZING LEGEND

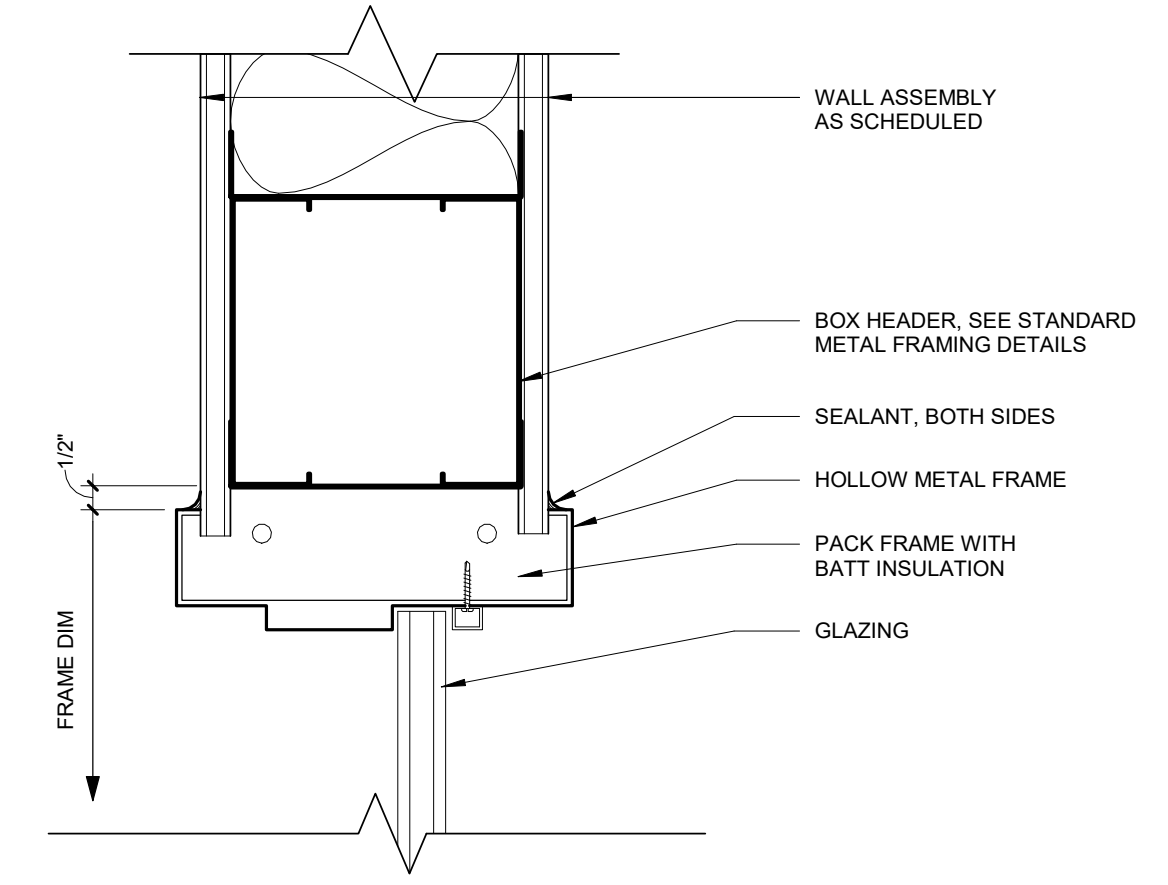


INTERIOR WINDOW FRAMES

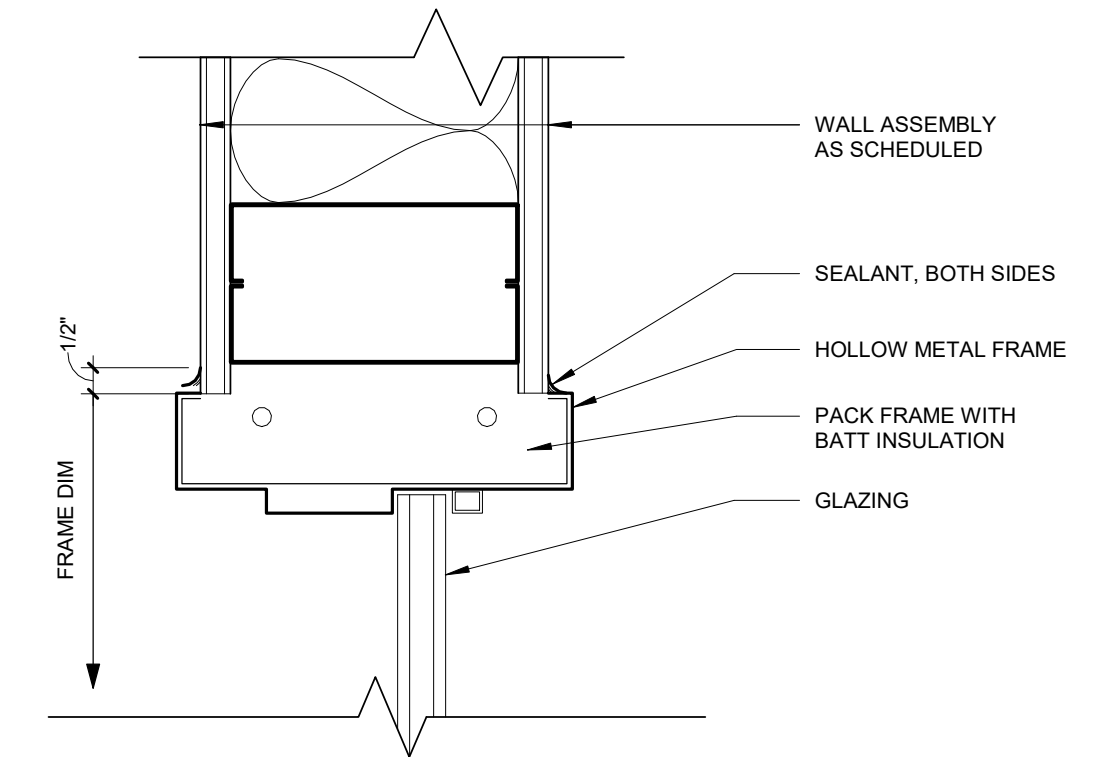


EXTERIOR WINDOW FRAMES

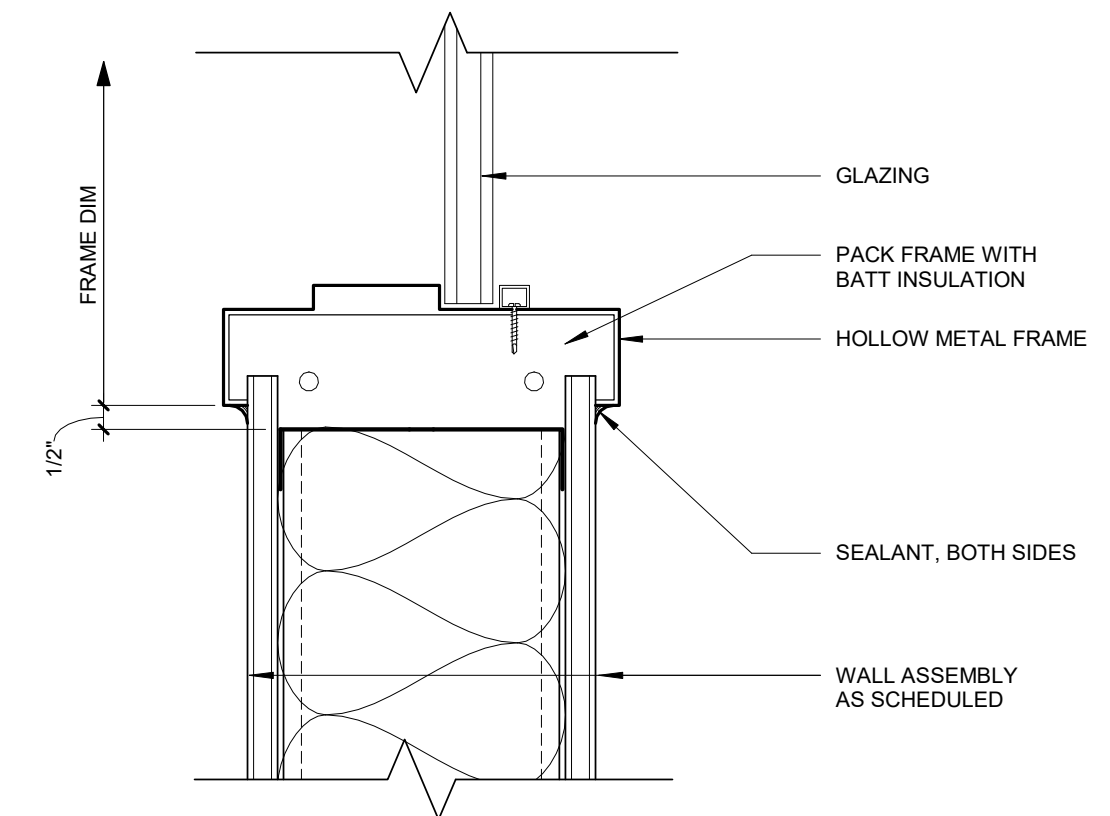




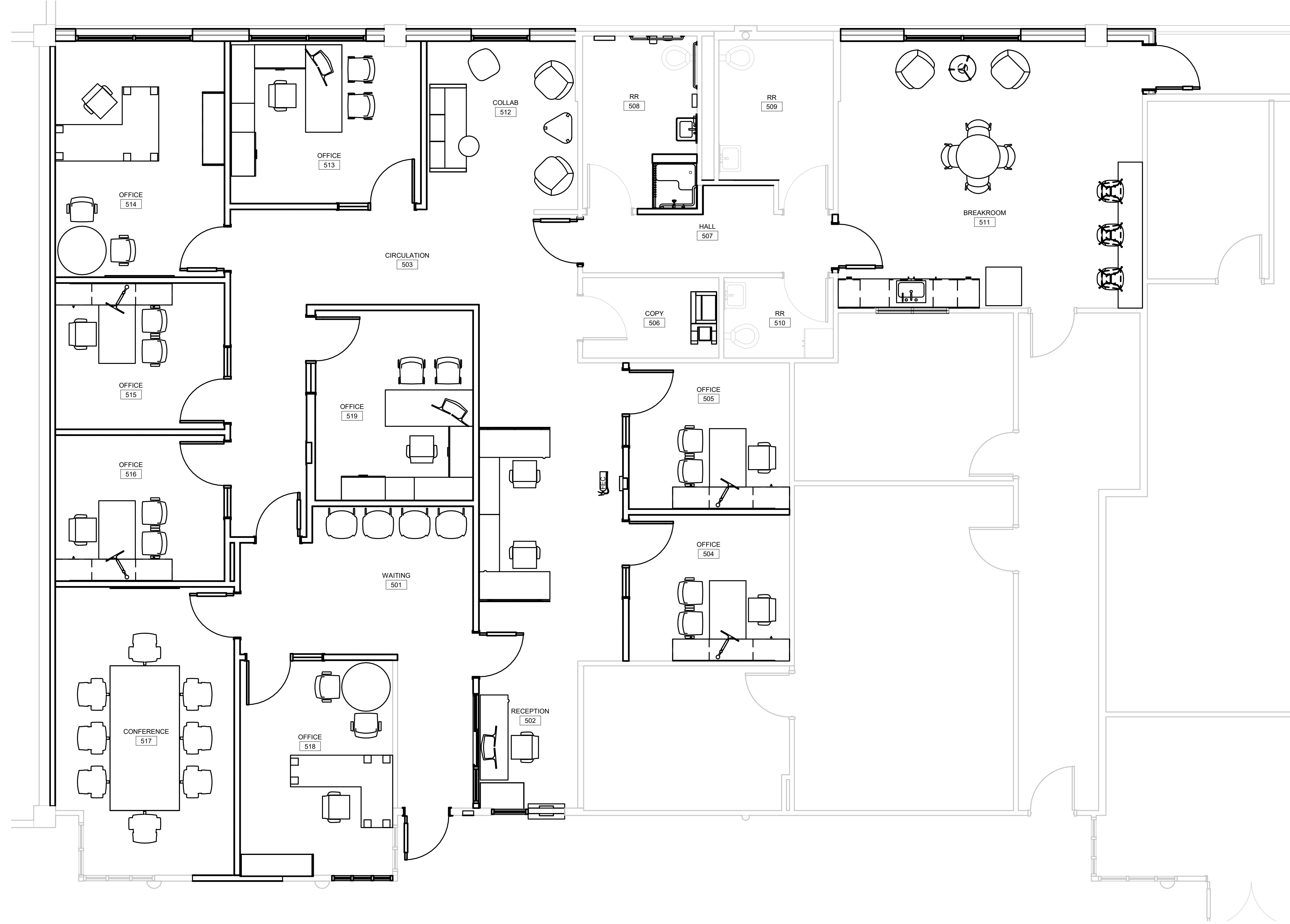
3 HM WINDOW HEAD
3" = 1'-0"



2 HM WINDOW JAMB
3" = 1'-0"

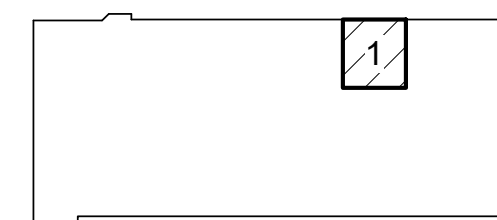
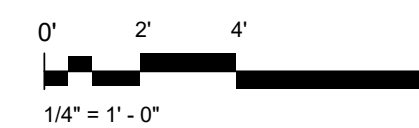


1 HM WINDOW FRAME SILL
3" = 1'-0"

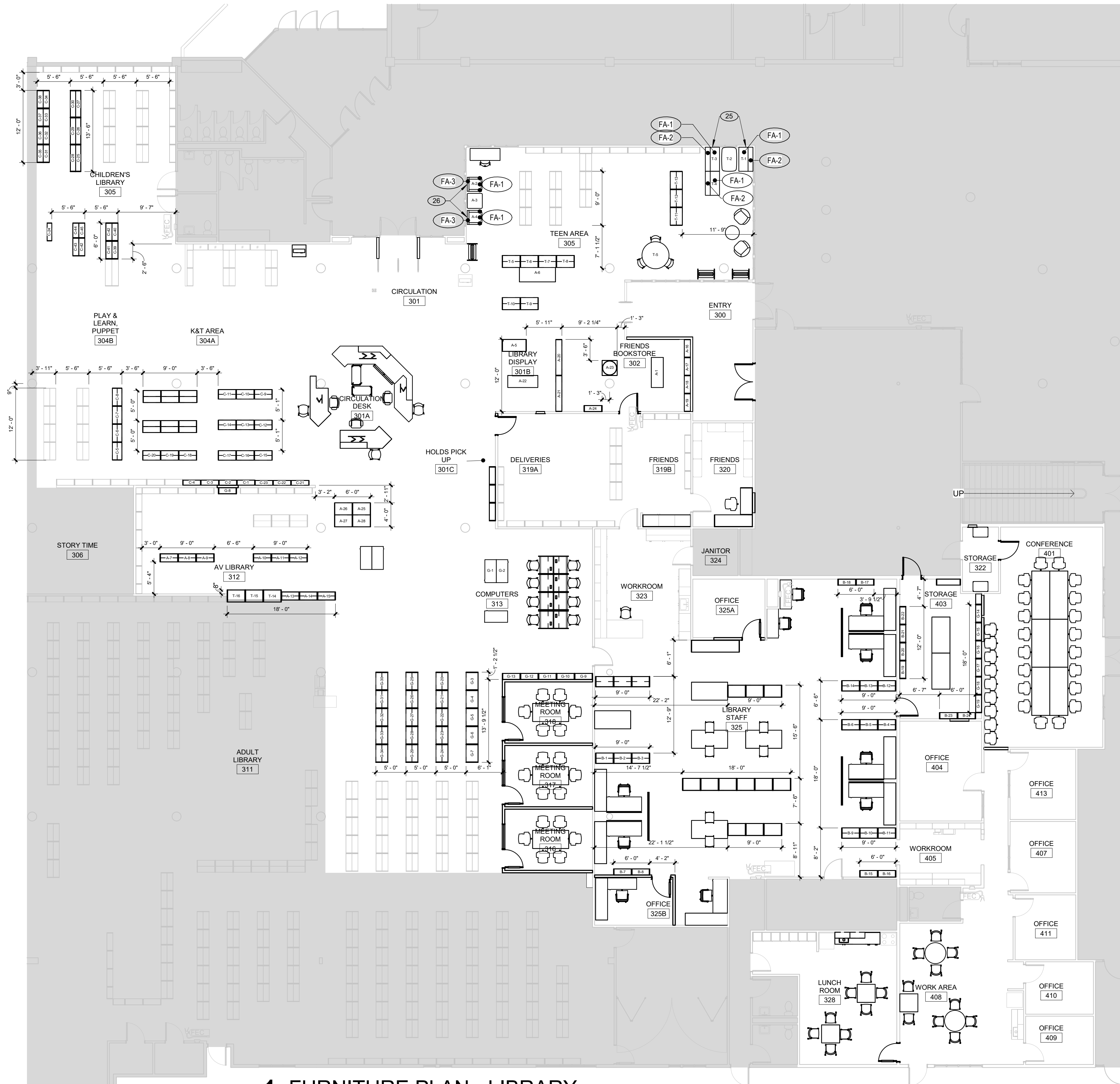


1 FURNITURE PLAN - CM OFFICE

1/4" = 1'-0"



KEYPLAN



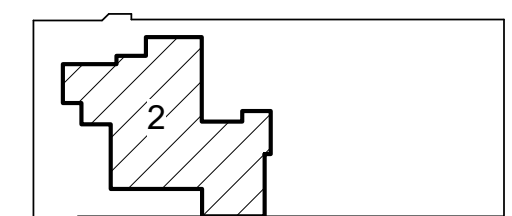
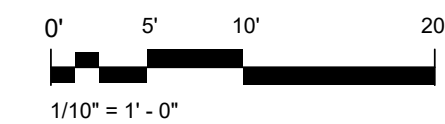
1 FURNITURE PLAN - LIBRARY
1" = 10'-0"

KEYNOTES

- 25 ADD ALT L-4 - REUPHOLSTER (E) VINYL BOOTH SEATING
- 26 ADD ALT L-4 - REUPHOLSTER (E) ARM CHAIRS

FURNITURE PLAN LEGEND

- EXISTING BOOK SHELVES TO REMAIN IN PLACE
- RELOCATED BOOK SHELVES, OFCI
- NEW BOOK SHELVES, OFCI



KEYPLAN



REVISIONS:

#	DESCRIP.	DATE

FIRE PROTECTION LEGEND

PIPING

SYMBOL	ABBREV.	DESCRIPTION
FIRE PROTECTION PIPING:		
	CAFS	CLEAN AGENT FIRE SUPPRESSION
	F	FIRE COMMON SUPPLY
	D	FIRE SYSTEM DRAIN
	DSPR	FIRE SPRINKLER - DRY PREACTION
	DSPR	FIRE SPRINKLER - DRY
	SPR	FIRE SPRINKLER - WET
	SP	FIRE STANDPIPE - WET
	W	FIRE WATER SERVICES

SYMBOL	ABBREV.	DESCRIPTION
		PIPING UP
		PIPING DOWN
		CAPPED PIPE
		PIPE REDUCING FITTING: CONCENTRIC, ECCENTRIC
		UNION
	PUMP	PUMP
	DV	DRAIN VALVE
	BV	BALL VALVE
	BFV	BUTTERFLY VALVE
	CHV	CHECK VALVE
	GV	GATE VALVE
		WATER FLOW SWITCH
		SIGHT FLOW INDICATOR
		PRESSURE GAUGE
	FD	FLOOR DRAIN
	HB	HOSE BIBB (DIAGRAM)
	HB	HOSE BIBB (PLAN)
	FDC	FIRE DEPARTMENT CONNECTION
		REDUCED PRESSURE BACKFLOW PREVENTER
		DOUBLE CHECK BACKFLOW PREVENTER
		DOUBLE CHECK DETECTOR ASSEMBLY
		ZONE CONTROL ASSEMBLY
		HOSE VALVE
		OS + Y GATE VALVE
EC = EXTENDED COVERAGE		
		CONCEALED PENDANT FIRE SPRINKLER
		PENDENT FIRE SPRINKLER
		UPRIGHT FIRE SPRINKLER
		SIDEWALL FIRE SPRINKLER

GENERAL

SYMBOL	ABBREVIATION	DESCRIPTION
	(E)	EXISTING
	ø OR dia	DIAMETER
		NEW TO EXISTING POINT OF CONNECTION
		NOTE REFERENCE MARKER
	PLAN OR DETAIL NUMBER	PLAN OR DETAIL REFERENCE MARKER
	SHEET NUMBER	
	SECTION LETTER	SECTION REFERENCE MARKER
	SHEET NUMBER	
	EQUIPMENT TYPE	EQUIPMENT MARKER
	EQUIPMENT NUMBER	
	ROOM NAME	ROOM MARKER
	ROOM NUMBER	
		EXISTING SHOWN LIGHT
		NEW WORK SHOWN BOLD
		EXISTING TO BE REMOVED
		FIRE SPRINKLER ZONE BOUNDARY

ABBREVIATIONS

ABC	ABOVE CEILING	GPM	GALLONS PER MINUTE
AC	AIR COMPRESSOR	HP	HORSEPOWER
ACFM	ACTUAL CUBIC FEET PER MINUTE	HWAC	HEATING, VENTILATING, & AIR CONDITIONING
ACV	ALARM CHECK VALVE	HZ	HERTZ
ABD	AUTOMATIC BALL DROP	IE	INVERT ELEVATION
ACT	ACOUSTICAL CEILING TILE	IN	INCH, INCHES
AFF	ABOVE FINISHED FLOOR	IN WC	INCHES WATER COLUMN
AFG	ABOVE FINISHED GRADE	JP	JOCKEY PUMP
AFS	AUTOMATIC FIRE SPRINKLER	JPC	JOCKEY PUMP CONTROLLER
ALT	ALTERNATE	KW	KILOWATT
ARCH	ARCHITECT/ARCHITECTURAL	KWH	KILOWATT-HOUR
AS	AUTOMATIC SPRINKLER	LBS	POUNDS
ATS	AUTOMATIC TRANSFER SWITCH	MAX	MAXIMUM
ASC	AGENT STORAGE CONTAINER	MCA	MINIMUM CIRCUIT AMPACITY
BAS	BUILDING AUTOMATION SYSTEM	MECH	MECHANICAL
BFP	BACKFLOW PREVENTER	MFR	MANUFACTURER
BLDG	BUILDING	MIN	MINIMUM
BTUH	BRITISH THERMAL UNITS PER HOUR	MOP	MAXIMUM OVERCURRENT PROTECTION
CA	CLEAN AGENT	(N)	NEW
CFCI	CONTRACTOR FURNISHED/ CONTRACTOR INSTALLED	NA	NOT APPLICABLE
CFH	CUBIC FEET PER HOUR	NC	NORMALLY CLOSED
CFM	CUBIC FEET PER MINUTE	NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
CFOI	CONTRACTOR FURNISHED/ OWNER INSTALLED	NIC	NOT IN CONTRACT
CI	CAST IRON	(NL)	NEW LOCATION
CLG	CEILING	NO	NORMALLY OPEN
CMU	CONCRETE MASONRY UNIT	NPSH	NET POSITIVE SUCTION HEAD
CO2	CARBON DIOXIDE	NPT	NATIONAL PIPE THREAD
CONC	CONCRETE	NTS	NOT TO SCALE
CONT	CONTINUATION	OFI	OWNER FURNISHED/ CONTRACTOR INSTALLED
DBA	DECIBELS ACOUSTIC	OH	OWNER FURNISHED/OWNER INSTALLED
DCDA	DOUBLE CHECK DETECTOR ASSEMBLY	OH	OVERHEAD
(D)	DEMOLITION	OP	PRESSURE DROP
DIA	DIAMETER	PLBG	PLUMBING
DI	DUCTILE IRON	POC	POINT OF CONNECTION
DL	DELUGE	PH	PHASE
DN	DOWN	PRV	PRESSURE REGULATING VALVE
DSPR	DRY SPRINKLER PIPE	PSI	POUNDS PER SQUARE INCH
(E)	EXISTING	PSIG	POUNDS PER SQUARE INCH GAUGE
EC	EXTENDED COVERAGE	(R)	RELOCATE
ELEC	ELECTRICAL	REQD	REQUIRED
F	FIRE WATER SUPPLY	RPM	REVOLUTIONS PER MINUTE
FA	FIRE ALARM	SCCR	SHORT CIRCUIT CURRENT RATING
FD	FLOOR DRAIN	SCFM	STANDARD CUBIC FEET PER MINUTE
FDC	FIRE DEPARTMENT CONNECTION	SCH	SCHEDULE
FHV	FIRE HOSE VALVE	SPKR	SPRINKLER
FLA	FULL LOAD AMPS	SQFT	SQUARE FEET
FP	FIRE PUMP	SS	STAINLESS STEEL
FPC	FIRE PUMP CONTROLLER	TYP	TYPICAL
FPM	FEET PER MINUTE	UG	UNDERGROUND
FS	FLOW SWITCH	UON	UNLESS OTHERWISE NOTED
FT	FEET	V	VOLTAGE
FT WC	FEET WATER COLUMN	VFD	VARIABLE FREQUENCY DRIVE
GAL	GALLON	W	WATT
GALV	GALVANIZED	WC	WATER COLUMN
GPH	GALLONS PER HOUR	WG	WATER GAUGE
		ZV	ZONE VALVE

GENERAL NOTES

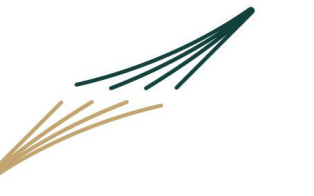
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2. SIZE AND LOCATION OF ALL PIPING AND OTHER MECHANICAL EQUIPMENT IS APPROXIMATE. CONTRACTOR SHALL SITE VERIFY THE LOCATION OF EXISTING PIPING AND EQUIPMENT AND CONSTRUCT WORK FROM FIELD DIMENSIONS. CONTRACTOR SHALL MAKE ADJUSTMENTS NECESSARY TO ACCOMMODATE MINOR DEVIATIONS AT NO COST TO OWNER.
3. FINE (LIGHT) LINE WORK INDICATES EXISTING PIPING AND OTHER MECHANICAL EQUIPMENT. BOLD (HEAVY) LINE WORK INDICATES NEW PIPING AND OTHER MECHANICAL EQUIPMENT.
4. IT IS RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE CUTTING AND PATCHING TO ALLOW THE INSTALLATION OF MATERIALS AND EQUIPMENT AS SPECIFIED AND SHOWN ON DRAWINGS.
5. WHERE (E) FIRE PROTECTIVE TREATMENT ON STRUCTURAL MEMBERS IS DAMAGED OR REMOVED AS A RESULT OF WORK, REPAIR TREATMENT TO MATCH (E).

DEMOLITION NOTES

1. REVIEW DEMOLITION DRAWINGS FOR ITEMS TO REMAIN, TO BE RETAINED FOR RELOCATION, OR TO BE SALVAGED TO THE OWNER. REFER TO ARCHITECTURAL DOCUMENTS FOR ADDITIONAL REQUIREMENTS.
2. DEMOLISH EQUIPMENT, FIXTURES, DEVICES, PIPING, CONDUIT, FITTINGS, AND APPURTENANCES INTERIOR TO THE BUILDING THAT ARE MADE OBSOLETE BY THE NEW WORK AND/OR ARE ABANDONED AND NO LONGER IN USE.
3. PROTECT AND MAINTAIN OPERABLE EXISTING EQUIPMENT, FIXTURES, OR SYSTEMS THAT ARE INDICATED TO REMAIN, INCLUDING ELECTRICAL POWER, CONTROLS, AND RELATED SYSTEMS REQUIRED TO MAINTAIN OPERABILITY.
4. EXISTING CONDITIONS SHOWN ARE BASED ON RECORD DOCUMENTS AND LIMITED FIELD OBSERVATIONS OF ACCESSIBLE AREAS AND MAY NOT SHOW THE ENTIRE SCOPE OF DEMOLITION WORK. OMISSION OF EXISTING EQUIPMENT, FIXTURES, DEVICES, PIPING, CONDUIT, FITTINGS, AND APPURTENANCES FROM THE DEMOLITION DRAWINGS DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO PROVIDE DEMOLITION OF SYSTEMS THAT ARE MADE OBSOLETE BY THE NEW WORK, ARE ABANDONED, OR AS OTHERWISE REQUIRED TO PERFORM THE WORK DESCRIBED HEREIN.
5. PROTECT AND MAINTAIN SERVICES TO REMAIN OPERATIONAL THAT PASS THROUGH THE AREA OF CONSTRUCTION. WHERE IT IS NOT POSSIBLE TO MAINTAIN THESE SERVICES INTACT, REPLACE, REROUTE, MODIFY, OR PROVIDE NEW AS REQUIRED TO MAINTAIN SERVICES.

SHEET LIST - FIRE PROTECTION

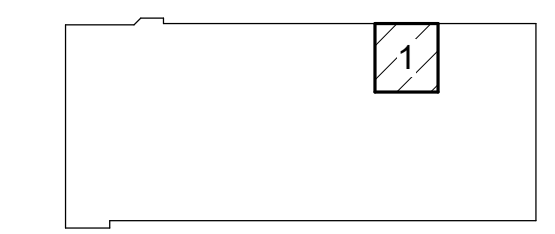
F001	LEGEND, GENERAL NOTES, & SHEET LIST
F111	SECOND FLOOR PLAN - CM OFFICE
F112	SECOND FLOOR PLAN - LIBRARY





- REFERENCE NOTES:
- 1 NO FIRE SUPPRESSION WORK THIS AREA.
 - 2 (D) PENDENT DRY SPRINKLER HEADS ABOVE EXTERIOR BALCONY & (D) SPRINKLER HEADS ABOVE CEILING. RETAIN (E) SPRINKLER PIPING AS NECESSARY FOR CONNECTION TO (N) SPRINKLER HEADS.
 - 3 (D) PENDENT SPRINKLER HEADS & SPRINKLER HEADS ABOVE CEILING. RETAIN (E) SPRINKLER PIPING AS NECESSARY FOR CONNECTION TO (N) SPRINKLER HEADS.
 - 4 PROVIDE LIGHT HAZARD COVERAGE FOR THIS AREA WITH QUICK-RESPONSE SEMI-RECESSED SPRINKLER HEADS. ADJUST SPRINKLER HEAD LOCATIONS AS NECESSARY TO ACCOMMODATE CHANGES TO ROOM & CEILING GRID LAYOUT. EXTEND (E) SPRINKLER PIPING AS NECESSARY TO CONNECT TO NEW SPRINKLER HEADS.

1 FLOOR PLAN - CM OFFICE
1/4" = 1'-0"



KEYPLAN



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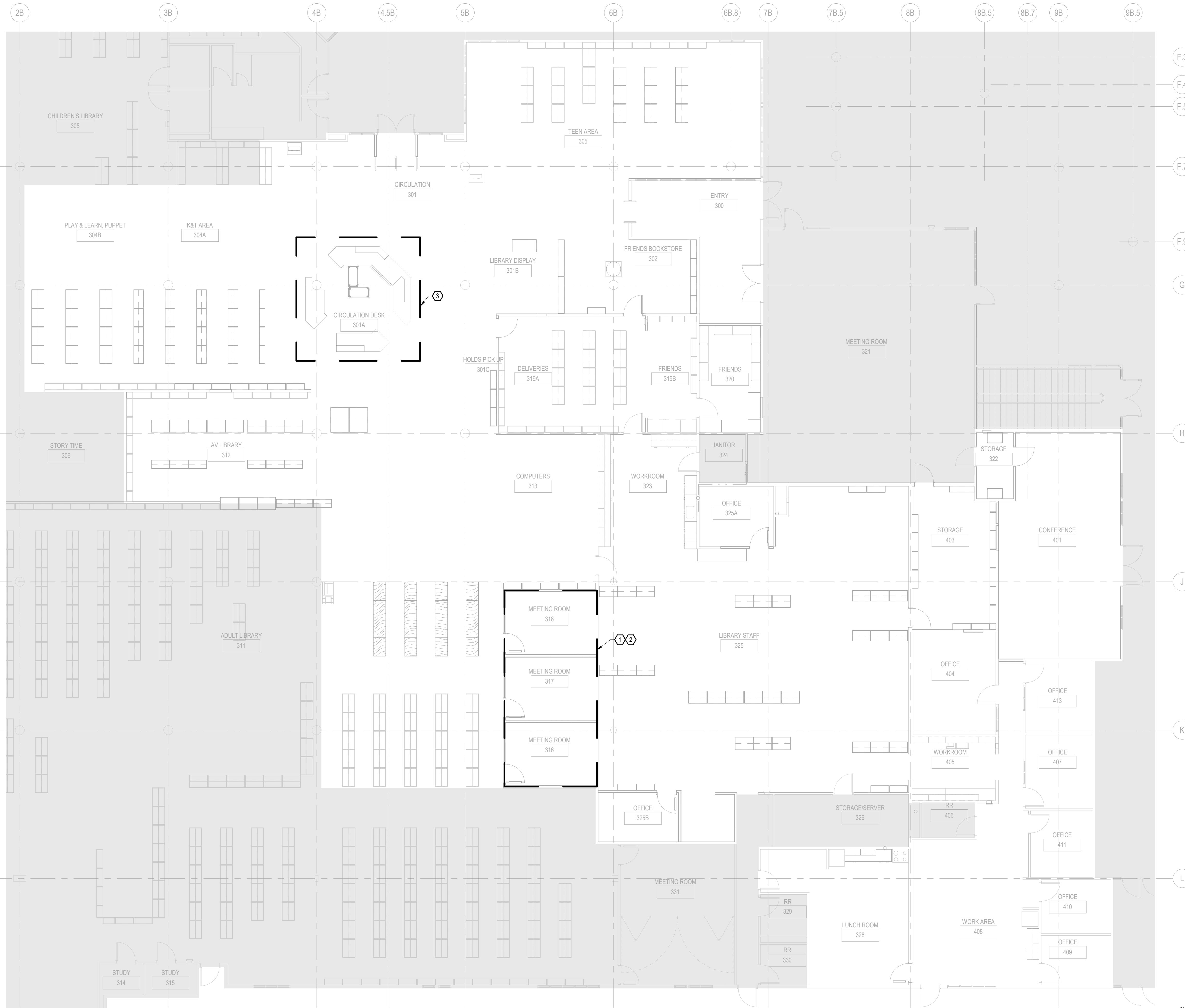
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CITY OF SPRINGFIELD
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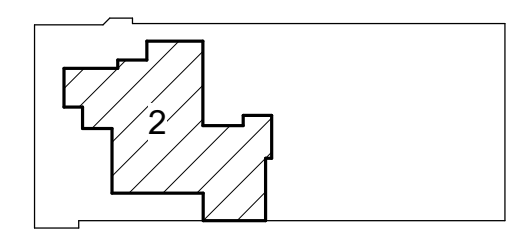
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#	DESCRP.	DATE

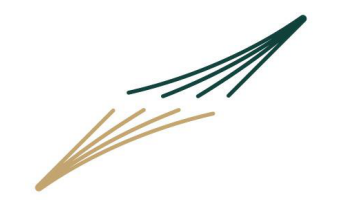
ISSUE DATE: 04.10.2023



- REFERENCE NOTES:
- ① (D) PENDENT SPRINKLER HEADS & SPRINKLER HEADS ABOVE CEILING. RETAIN (E) SPRINKLER PIPING AS NECESSARY FOR CONNECTION TO (N) SPRINKLER HEADS.
 - ② PROVIDE LIGHT HAZARD COVERAGE FOR THIS AREA WITH QUICK-RESPONSE SEMI-RECESSED SPRINKLER HEADS. ADJUST SPRINKLER HEAD LOCATIONS AS NECESSARY TO ACCOMMODATE CHANGES TO ROOM & CEILING GRID LAYOUT. EXTEND (E) SPRINKLER PIPING AS NECESSARY TO CONNECT TO NEW SPRINKLER HEADS.
 - ③ ALTERNATE L-2:
 - (D) PENDENT SPRINKLER HEADS & SPRINKLER HEADS ABOVE CEILING. RETAIN (E) SPRINKLER PIPING AS NECESSARY FOR CONNECTION TO (N) SPRINKLER HEADS.
 - PROVIDE ORDINARY HAZARD GROUP 1 COVERAGE FOR THIS AREA WITH PENDANT HEADS BELOW CEILING AND UPRIGHT HEADS ABOVE CEILING. COORDINATE HEAD INSTALLATION WITH WOOD CEILING STRUCTURE. EXTEND (E) SPRINKLER PIPING AS NECESSARY TO CONNECT TO NEW SPRINKLER HEADS.



1 FLOOR PLAN - LIBRARY
1/8" = 1'-0"



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F112

PLUMBING LEGEND

PIPING

SYMBOL	ABBREV.	DESCRIPTION
	F	FIRE COMMON SUPPLY
PLUMBING PIPING:		
	CW	POTABLE COLD WATER
	HW	POTABLE HOT WATER
	V	SANITARY PLUMBING VENT
	W	SANITARY WASTE

GENERAL

SYMBOL	ABBREVIATION	DESCRIPTION
	DIA	DIAMETER
		SLOPE OF PIPE IN DECIMALS OF FEET
		CAPPED PIPE
		PIPE REDUCING FITTING: CONCENTRIC, ECCENTRIC
		DIRECTION OF FLOW
		UNION
	DV	DRAIN VALVE
	BV	BALL VALVE
	BFV	BUTTERFLY VALVE
	CHV	CHECK VALVE
	GV	GATE VALVE
	GBV	GLOBE VALVE
		ECCENTRIC PLUG VALVE
	AV	AUTOMATIC CONTROL VALVE: 2-WAY
	AV	AUTOMATIC CONTROL VALVE: 3-WAY
	AV	AUTOMATIC BUTTERFLY VALVE
	SV	SOLENOID VALVE
	PRV	PRESSURE REGULATING VALVE
		FLEXIBLE PIPE CONNECTION
	RV	RELIEF VALVE
	SSV	STEAM SAFETY VALVE
	TPS	TEMPERATURE/PRESSURE SAFETY VALVE
	BPV	BACK PRESSURE VALVE
		WATER FLOW SWITCH
		SIGHT FLOW INDICATOR
		SENSOR WELL
		MANUAL AIR VENT
		AUTOMATIC AIR VENT
		THERMOMETER
		PRESSURE GAUGE
		TEST PLUG
		FLOW INDICATOR
		METER, SELF-CONTAINED
		STEAM TRAP
		VACUUM BREAKER (STEAM)
		ORIFICE PLATE
		VENTURI
		ANNUBAR FLOW SENSOR
	FMS	FLOW MEASURING STATION
	COTG, FCO	CLEANOUT TO GRADE, FLOOR CLEANOUT
	WCO	WALL CLEANOUT
	FD	FLOOR DRAIN
	HB	HOSE BIBB (DIAGRAM)
	HB	HOSE BIBB (PLAN)
	RP	REDUCED-PRESSURE PRINCIPLE BACKFLOW PREVENTER
	DCV	DOUBLE CHECK BACKFLOW PREVENTER
		WATER HAMMER ARRESTOR
		PENETRATION THROUGH WALL, FLOOR, OR ROOF
		DIAPHRAGM VALVE

ABBREVIATIONS

ABC	ABOVE CEILING	ID	INSIDE DIAMETER
ABS	ACRYLONITRILE BUTADIENE STYRENE	IE	INVERT ELEVATION
AC	AIR COMPRESSOR	IN	INCH, INCHES
ACFM	ACTUAL CUBIC FEET PER MINUTE	IN WC	INCHES WATER COLUMN
ACT	ACOUSTICAL CEILING TILE	IPS	IRON PIPE SIZE
AD	AREA DRAIN	IW	INDIRECT WASTE
ADA	AMERICANS WITH DISABILITY ACT	KW	KILOWATT
AFF	ABOVE FINISHED FLOOR	KWH	KILOWATT-HOUR
AFG	ABOVE FINISHED GRADE	LBS	POUNDS
AFS	AUTOMATIC FIRE SPRINKLER	LAV	LAVATORY
AHJ	AUTHORITY HAVING JURISDICTION	LF	LINEAR FEET
ALT	ALTERNATE	LPG	LIQUIFIED PETROLEUM GAS
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE	LWT	LEAVING WATER TEMPERATURE
ARCH	ARCHITECT/ARCHITECTURAL	MAX	MAXIMUM
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATING, & AIR-CONDITIONING ENGINEERS	MBH	THOUSAND BTUS PER HOUR
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS	MCA	MINIMUM CIRCUIT AMPACITY
ASPE	AMERICAN SOCIETY OF PLUMBING ENGINEERS	MECH	MECHANICAL
ASSE	AMERICAN SOCIETY OF SANITARY ENGINEERING	MFR	MANUFACTURER
AVTR	ACID VENT THROUGH ROOF	MN	MINIMUM
AWWA	AMERICAN WATER WORKS ASSOCIATION	MOP	MAXIMUM OVERCURRENT PROTECTION
BAS	BUILDING AUTOMATION SYSTEM	MS	MOTOR STARTER
BFF	BELOW FINISHED FLOOR	(N)	NEW
BFP	BACKFLOW PREVENTER	NA	NOT APPLICABLE
BLDG	BUILDING	NC	NORMALLY CLOSED
BHP	BRAKE HORSEPOWER	NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
BOP	BOTTOM OF PIPE	NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
BTUH	BRITISH THERMAL UNITS PER HOUR	NIC	NOT IN CONTRACT
CFCI	CONTRACTOR FURNISHED/ CONTRACTOR INSTALLED	(NL)	NEW LOCATION
CFH	CUBIC FEET PER HOUR	NO	NORMALLY OPEN
CFM	CUBIC FEET PER MINUTE	NPSH	NET POSITIVE SUCTION HEAD
CFOI	CONTRACTOR FURNISHED/ OWNER INSTALLED	NPT	NATIONAL PIPE THREAD
CGA	COMPRESSED GAS ASSOCIATION	NTS	NOT TO SCALE
CI	CAST IRON	OD	OUTSIDE DIAMETER
CLG	CEILING	OFCI	OWNER FURNISHED/ CONTRACTOR INSTALLED
CMU	CONCRETE MASONRY UNIT	OFOI	OWNER FURNISHED/ OWNER INSTALLED
CO	CLEANOUT	OH	OVERHEAD
CONC	CONCRETE	OPSC	OREGON PLUMBING SPECIALTY CODE
CONT	CONTINUATION	OSHA	OCCUPATION SAFETY AND HEALTH ADMINISTRATION
COTG	CLEANOUT TO GRADE	PD	PRESSURE DROP
CPVC	CHLORINATED POLYVINYL CHLORIDE	PDI	PLUMBING & DRAINAGE INSTITUTE
CR	CONTROL RELAY	PE	POLYETHYLENE
(D)	DEMOLISH/ DEMOLITION	PEX	CROSS-LINKED POLYETHYLENE
DBA	DECIBELS ACOUSTIC	PLBG	PLUMBING
DCDA	DOUBLE CHECK DETECTOR ASSEMBLY	POC	POINT OF CONNECTION
DCV	DOUBLE CHECK VALVE	PH	PHASE
DF	DRINKING FOUNTAIN	PP	POLYPROPYLENE
DFU	DRAINAGE FIXTURE UNIT	PPH	POUNDS PER HOUR
DIA	DIAMETER	PPM	PARTS PER MILLION
DI	DUCTILE IRON	PRV	PRESSURE REGULATING VALVE
DI WATER	DEIONIZED WATER	PSI	POUNDS PER SQUARE INCH
DN	DOWN	PSIG	POUNDS PER SQUARE INCH GAUGE
DW	DISTILLED WATER	PTFE	POLYTETRAFLUOROETHYLENE (TEFLON)
DWG	DRAWING	PVC	POLYVINYL CHLORIDE
(E)	EXISTING	PVDF	POLYVINYLIDENE FLUORIDE
ECM	ELECTRONICALLY COMMUTATED MOTOR	(R)	RELOCATE
EEM	ENERGY EFFICIENCY MEASURE	RD	ROOF DRAIN
ELEC	ELECTRICAL	REQ'D	REQUIRED
EPDM	ETHYLENE PROPYLENE-DIENE MONOMER	RO	REVERSE OSMOSIS
EWT	ENTERING WATER TEMPERATURE	RPR/PBP	REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTER
FA	FIRE ALARM	RPM	REVOLUTIONS PER MINUTE
FD	FLOOR DRAIN	SCCR	SHORT CIRCUIT CURRENT RATING
FDC	FIRE DEPARTMENT CONNECTION	SCFM	STANDARD CUBIC FEET PER MINUTE
FFE	FINISHED FLOOR ELEVATION	SCH	SCHEDULE
FLA	FULL LOAD AMPS	SDR	STANDARD DIMENSIONAL RATIO
FPM	FEET PER MINUTE	SPKR	SPRINKLER
FS	FLOOR SINK	SQFT	SQUARE FEET
FT	FEET	SS	STAINLESS SEEL
FT WC	FEET WATER COLUMN	TMV	THERMOSTATIC MIXING VALVE
FU	FIXTURE UNIT	TP	TRAP PRIMER
GAL	GALLON	TPA	TRAP PRIMER ARRAY
GALV	GALVANIZED	TSP	TOTAL STATIC PRESSURE
GI	GREASE INTERCEPTOR	TYP	TYPICAL
GPD	GALLONS PER DAY	U	UNDERGROUND
GPF	GALLONS PER FLUSH	UG	UNDERGROUND
GPH	GALLONS PER HOUR	UL	UNDERWRITERS LABORATORY
GPM	GALLONS PER MINUTE	UON	UNLESS OTHERWISE NOTED
HDPE	HIGH-DENSITY POLYETHYLENE	UPC	UNIFORM PLUMBING CODE
HOA	HAND-OFF-AUTOMATIC	UV	ULTRAVIOLET
HP	HORSEPOWER	V	VOLTAGE
HVAC	HEATING, VENTILATING, & AIR CONDITIONING	VFD	VARIABLE FREQUENCY DRIVE
HZ	HERTZ	VTR	VENT THROUGH ROOF
IAPMO	INTERNATIONAL ASSOCIATION OF PLUMBING, MECHANICAL OFFICIALS	W	WATT
		WB	WET BULB
		WC	WATER CLOSET
		WG	WATER GAUGE
		WH	WALL HYDRANT
		WHA	WATER HAMMER ARRESTOR
		WSFU	WATER SUPPLY FIXTURE UNITS

GENERAL NOTES

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2. SIZE AND LOCATION OF ALL PIPING AND OTHER MECHANICAL EQUIPMENT IS APPROXIMATE. CONTRACTOR SHALL SITE VERIFY THE LOCATION OF EXISTING PIPING AND EQUIPMENT AND CONSTRUCT WORK FROM FIELD DIMENSIONS. CONTRACTOR SHALL MAKE ADJUSTMENTS NECESSARY TO ACCOMMODATE MINOR DEVIATIONS AT NO COST TO OWNER.
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SHEET LIST - PLUMBING

P001	LEGEND, GENERAL NOTES, & SHEET LIST
P101	SECOND FLOOR DEMOLITION PLAN - CM OFFICE
P102	SECOND FLOOR DEMOLITION PLAN - LIBRARY
P121	FIRST FLOOR PLAN - CM OFFICE
P122	SECOND FLOOR PLAN - CM OFFICE
P123	SECOND FLOOR PLAN - LIBRARY
P601	SCHEDULES AND DETAILS



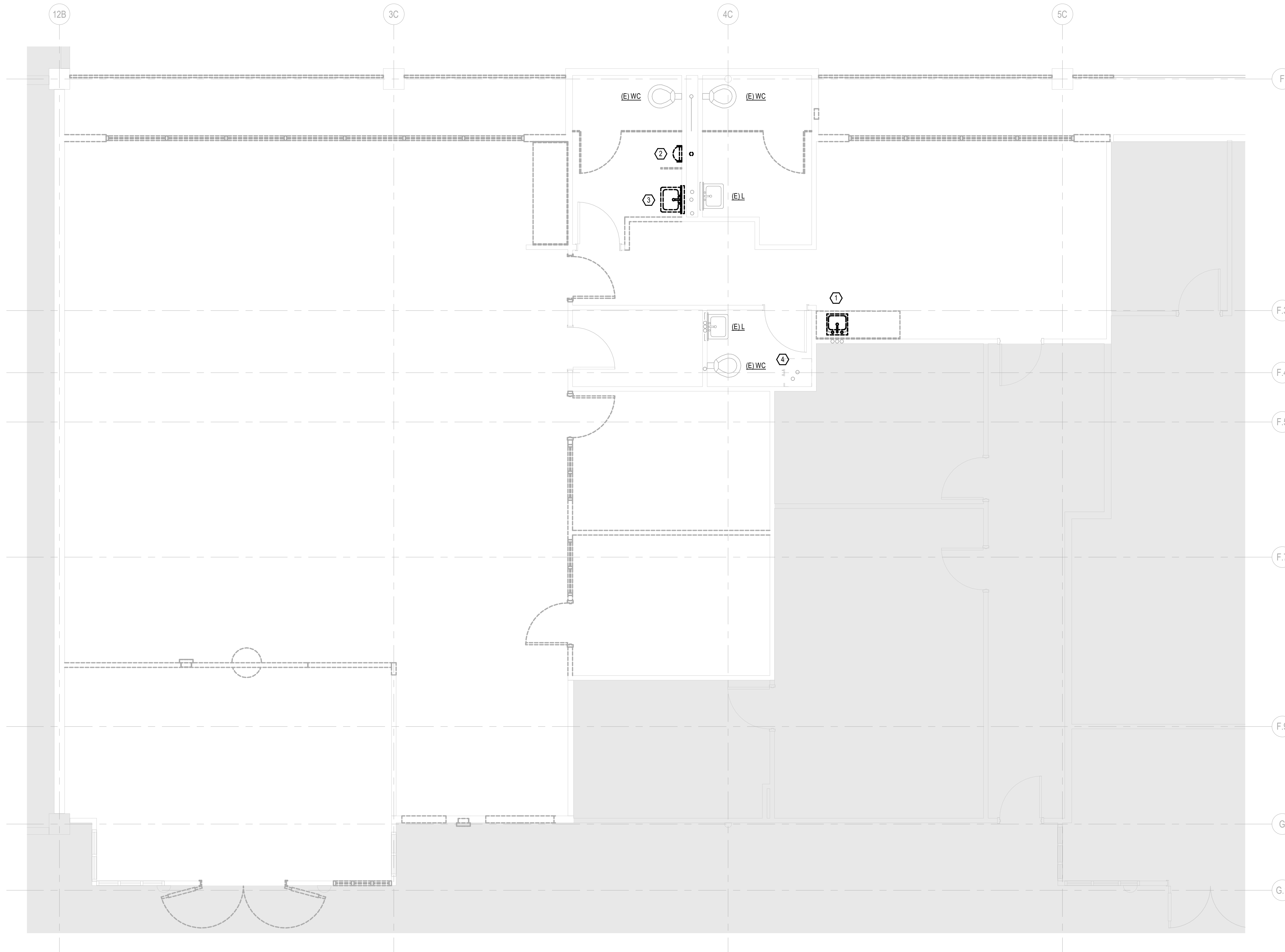
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SPRINGFIELD CITY HALL RENOVATION
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SHEET TITLE:
LEGEND, GENERAL NOTES, & SHEET LIST

REVISIONS:
DESCRP. DATE

ISSUE DATE: 04.10.2023

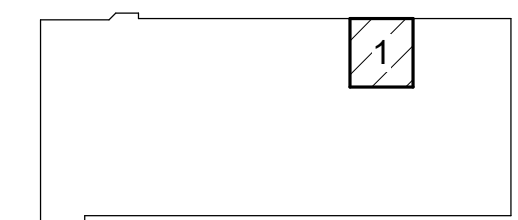
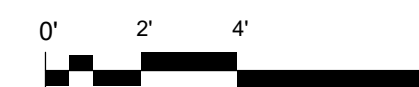


REFERENCE NOTES:

- ① (D) PLUMBING FIXTURE, CONFIRM (E) PIPING AND CONNECTIONS ARE SUITABLE FOR REUSE TO CONNECT TO NEW FIXTURE.
- ② (D) FIXTURE AND PIPING CAP (E) CW, W, & V AT ACTIVE MAINS BEHIND WALL.
- ③ (D) PLUMBING FIXTURE & CAP (E) W & V PIPING AT ACTIVE MAINS BEHIND WALL. RETAIN (E) CW & HW FOR RECONNECTION.
- ④ (D) WATER HEATER, DRAIN PAN, & WATER HEATER SUPPORT SHELF. KEEP (E) FLOOR DRAIN WITH FUNNEL, CW & HW PIPING & VALVES, & TRAP PRIMER PIPING & PRIMER VALVE.

1 DEMOLITION PLAN - CM OFFICE

1/4" = 1'-0"



KEYPLAN



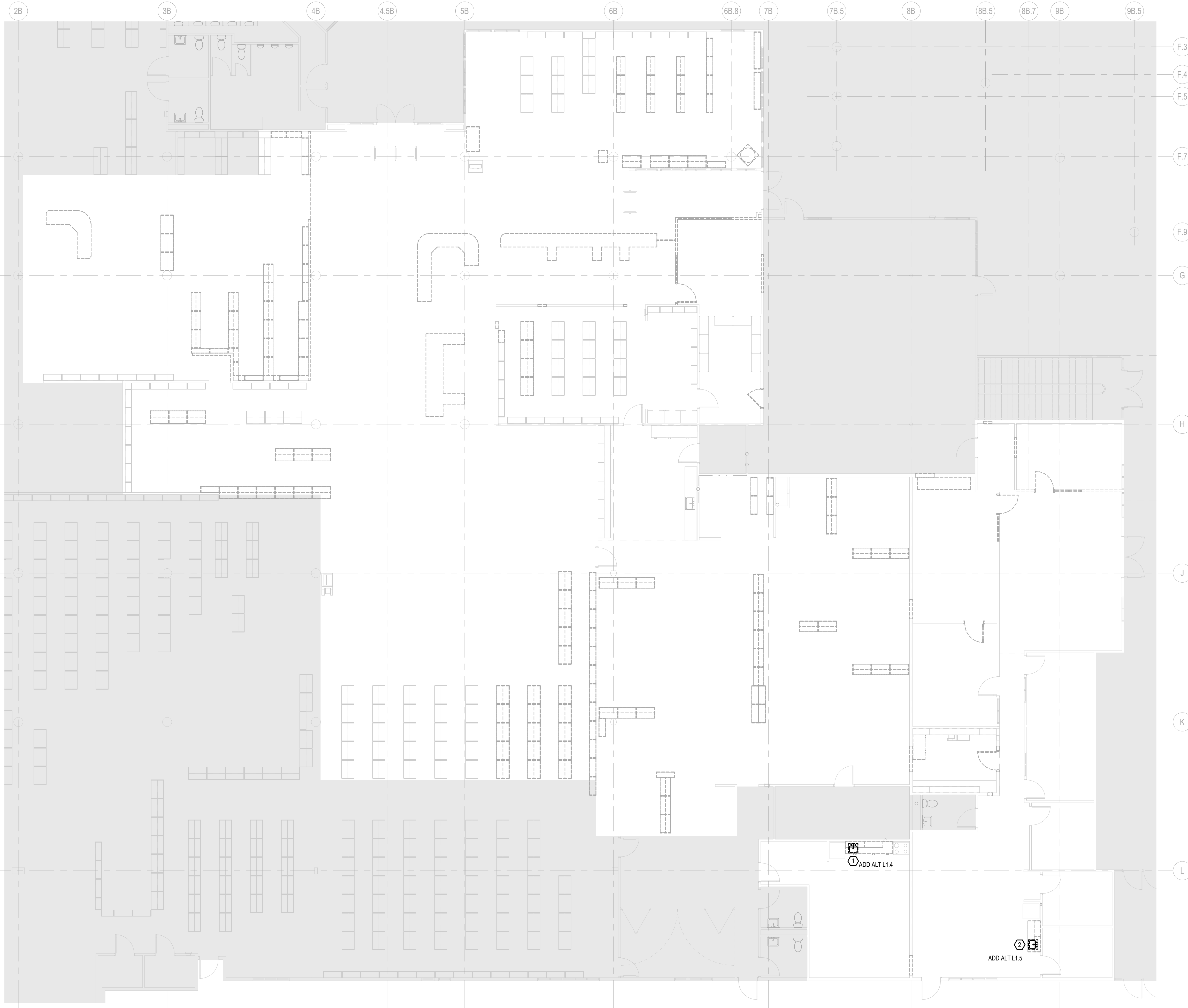
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SECOND FLOOR DEMOLITION PLAN - CM OFFICE

#	DESCRP.	DATE

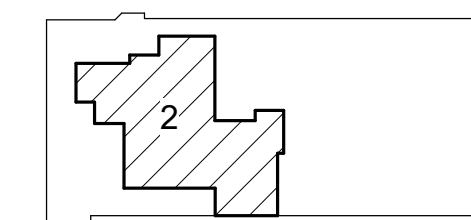
ISSUE DATE: 04.10.2023



REFERENCE NOTES:

- ① ADD ALT L1.4: (D) PLUMBING FIXTURE, CONFIRM (E) PIPING AND CONNECTIONS ARE SUITABLE FOR REUSE TO CONNECT TO NEW FIXTURE.
- ② ADD ALT L1.5: (D) FIXTURE AND PIPING, CAP (E) HW, CW, W, & V AT ACTIVE MAINS BEHIND WALL.

1 DEMOLITION PLAN - LIBRARY
 1/8" = 1'-0"



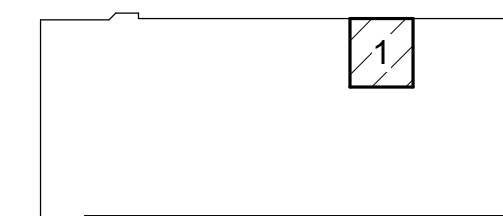
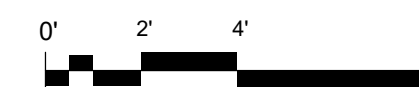
KEYPLAN



#	DESCRP.	DATE



1 FIRST FLOOR PLAN - CM OFFICE
1/4" = 1'-0"



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SHEET TITLE:
FIRST FLOOR PLAN - CM OFFICE

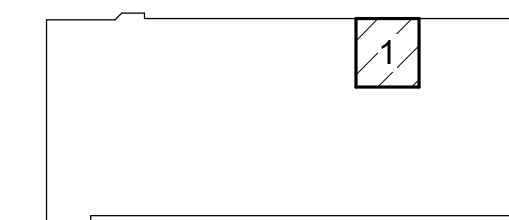
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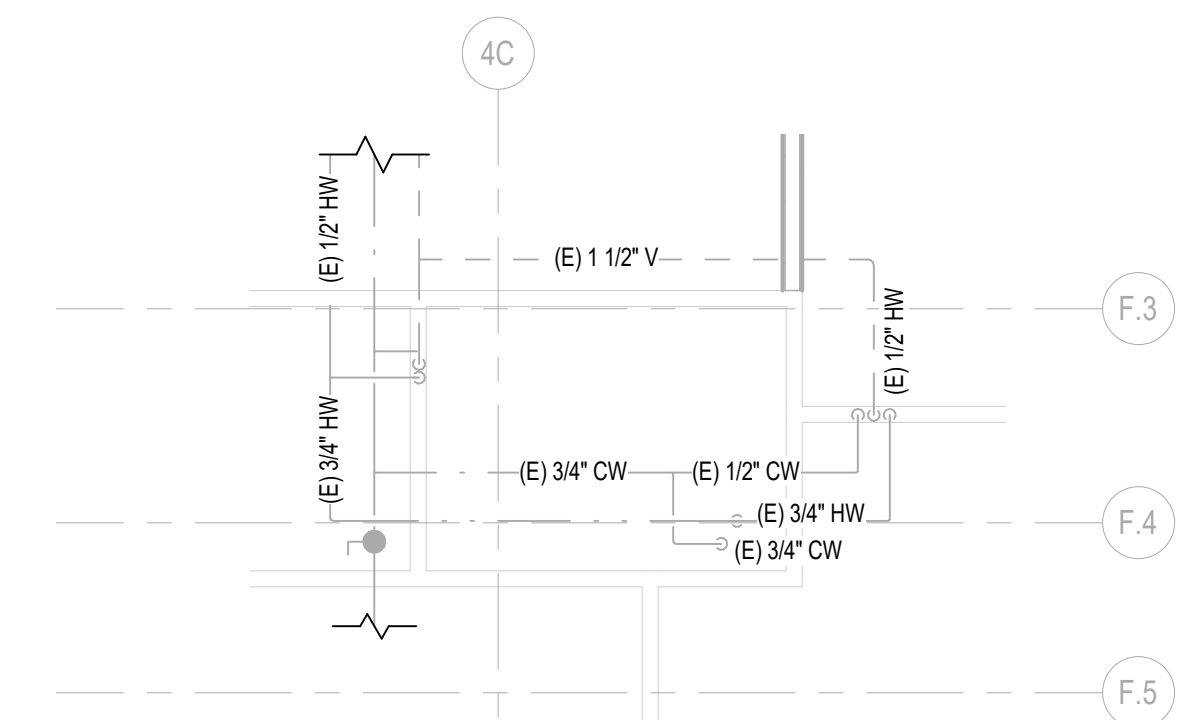
1 FLOOR PLAN - CM OFFICE
1/4" = 1'-0"



KEYPLAN

REFERENCE NOTES:

- ① ROUTE CW, HW, W, & V OVER FROM (E) LOCATION TO NEW SINK LOCATION.
- ② CONNECT PLUMBING FIXTURE, PIPING, & CONNECTIONS TO ACTIVE MAINS BEHIND WALL.
- ③ CONNECT PLUMBING FIXTURE TO (E) V, CW & HW BEHIND WALL. CONNECT W TO (E) W MAIN BELOW FLOOR.



2 FLOOR PLAN - THIRD FLOOR RR
1/4" = 1'-0"



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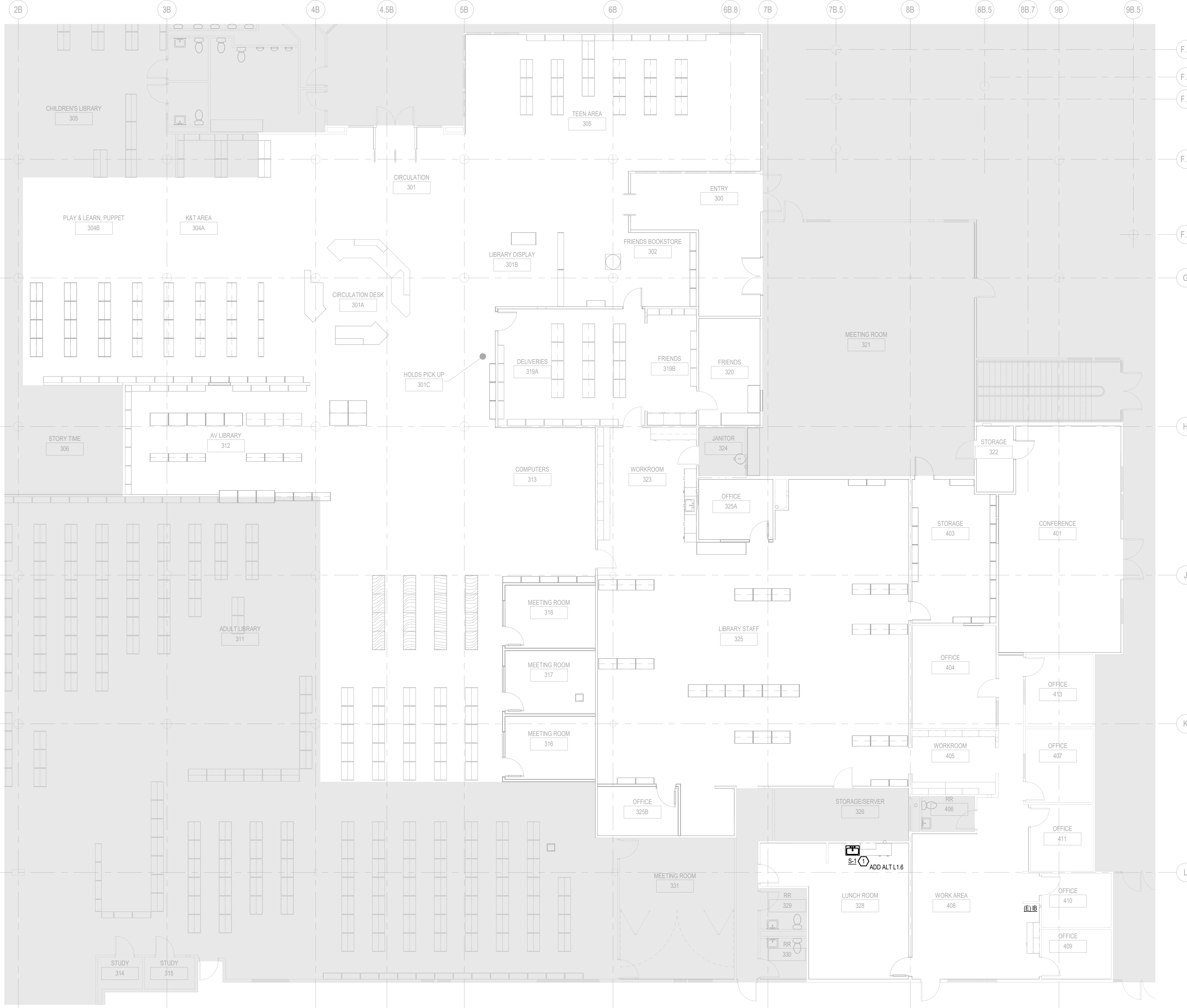
CONSTRUCTION DRAWINGS
 SPRINGFIELD CITY HALL RENOVATION
 PROJECT #: 2125.00
 CITY OF SPRINGFIELD
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SHEET TITLE:
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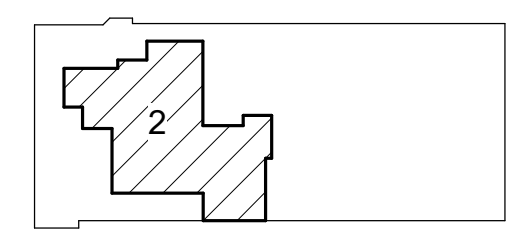
REVISIONS:

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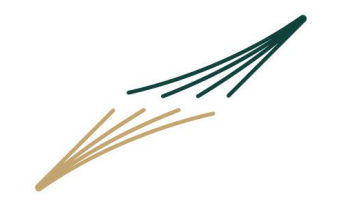
ISSUE DATE: 04.10.2023



REFERENCE NOTES:
 ① ADD ALT L1.6: CONNECT PLUMBING FIXTURE TO (E) PIPING AND CONNECTIONS.



1 FLOOR PLAN - LIBRARY
 1/8" = 1'-0"



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PLUMBING DESIGN CRITERIA

DOMESTIC WATER PIPING SYSTEM:

BASIS OF DESIGN: 2021 OREGON PLUMBING SPECIALTY CODE, APPENDIX A 'RECOMMENDED RULES FOR SIZING THE WATER SUPPLY SYSTEM'
 PIPING SIZED ON 4 FT W.C./100 FT DROP UNLESS OTHERWISE NOTED. VELOCITIES NOT TO EXCEED 8 FT/S FOR COLD WATER, 5 FT/S FOR HOT WATER, OR 4 FT/S FOR HOT WATER RETURN. WATER PIPING SIZING ASSUMES TYPE L COPPER AS BASIS OF DESIGN.

SANITARY WASTE AND VENT PIPING SYSTEM:

BASIS OF DESIGN: 2021 OREGON PLUMBING SPECIALTY CODE, CHAPTER 7 - 'SANITARY DRAINAGE' AND CHAPTER 9 - 'VENTS'
 ALL WASTE PIPING SLOPED AT 1/4-INCH/FT UNLESS OTHERWISE NOTED.
 ALL VENT PIPING INSTALLED HORIZONTAL OR SLOPED UPWARDS AT 1/8-INCH/FT UNLESS OTHERWISE NOTED.

PLUMBING FIXTURES - CMO PHASE

NOTES:

- (1) REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS, PLACEMENT, & MOUNTING HEIGHT OF PLUMBING FIXTURES.
- (2) ALL PLUMBING FIXTURES SHALL BE SEALED TO SURFACES WITH SILICONE SEALANT MATCHING ARCHITECTURAL FINISHES.
- (3) [B]: BASIN, [F]: FAUCET, [V]: FLUSH VALVE, [D]: DISPOSAL, [P]: SHOWER PAN, [S]: SHOWER SURROUND, [G]: GRAB BAR, [H]: HOT/COLD WATER DISPENSER, [HF]: HOT/COLD WATER FILTER

TAG	MANUFACTURER (3)	MODEL	TYPE	FLOW (GPM/GPF)	CONNECTIONS (IN)							REMARKS (1) (2)	
					W	V	IW	CW	HW	TW			
IB-1	OATEY	12K ICEMAKER BOX	ICEMAKER BOX	-	-	-	-	1/2	-	-	-	-	-
L-2	[B] AMERICAN STANDARD [F] DELTA	LUCERNE 0356_041 516LF-HGMHDF	LAVATORY	0.5	1-1/2	1-1/4	-	1/2	1/2	-	-	-	-
S-2	[B] ELKAY [F] MOEN [H] INSINKERATOR [HF] INSINKERATOR [D] INSINKERATOR	CROSSTOWN 18 GAUGE 22 1/2 x 18 1/2 x 9" UNDERMOUNT ARBOR MOTIONSENSE WAVE 7594EW SERIES HC-WAVE-SS 2/3 GAL HOT AND COOL INSTANT HOT WATER DISPENSER QUIET EVOLUTION EXCEL MULTI-GRIND SOUNDSSEAL 1HP AUTO REVERSE DISPOSER F-2000S FILTER .75 GPM FOR HOT WATER DISPENSER	SINK FAUCET HOT/COOL WATER DISPENSER HOT WATER DISPENSER FILTER DISPOSER	1.5	2	1-1/2	-	1/2	1/2	-	-	-	115V 750w 6.5 AMP WITH HEATING ELEMENT WITH GROUNDED 3 PRONG PLUG 120V SINGLE PHASE 10.2 AMP 60hz
SH-1	[P] [S] WILLOUGHBY INDUSTRIES [H] SYMMONS [G] KOHLER	AS-S3636C ADA AQUASURF WITH INTEGRAL REAR TRENCH DRAIN ASK-S3636ADA-GW SHOWER WALL KIT ORIGINS 9603-PLR PURIST 24" GRAB BAR K-11893	SHOWER	1.5	2	1-1/2	-	1/2	1/2	-	-	-	-

PLUMBING FIXTURES - LIBRARY PHASE

NOTES:

- (1) REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS, PLACEMENT, & MOUNTING HEIGHT OF PLUMBING FIXTURES.
- (2) ALL PLUMBING FIXTURES SHALL BE SEALED TO SURFACES WITH SILICONE SEALANT MATCHING ARCHITECTURAL FINISHES.
- (3) [B]: BASIN, [F]: FAUCET, [V]: FLUSH VALVE

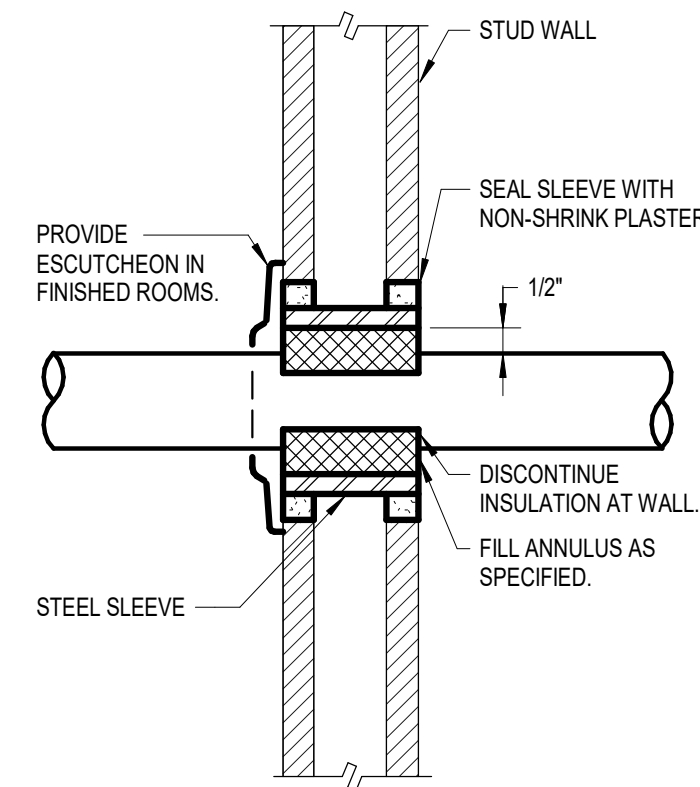
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					W	V	IW	CW	HW	TW			
S-1	[B] ELKAY [F] MOEN	ELKAY CROSSTOWN 18GAUGE 22 1/2 x 18 1/2 x 9" UNDERMOUNT ARBOR MOTIONSENSE WAVE 7594EW	SINK	1.5	1-1/2	1-1/4	-	1/2	1/2	-	-	-	ADD ALT

DOMESTIC WATER HEATER - ELEC

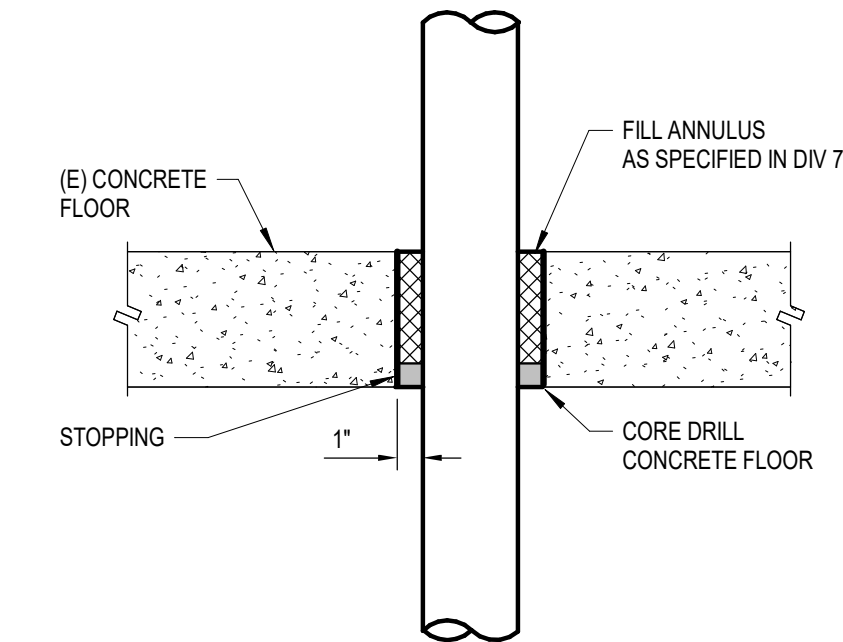
TAG	MANUFACTURER	MODEL	STORAGE CAPACITY (GAL)	HEATING CAPACITY					ELECTRICAL CONNECTION				REMARKS
				FLOW (GPH)	EWT (°F)	LWT (°F)	# of ELEMENTS	KW per ELEMENT	KW MAXIMUM	VOLT	PHASE	FLA	
DWH-1	BRADFORD WHITE	CEA20-KW-3	19	69	50	140	3	5	15	208	3	42	-

EXPANSION TANK

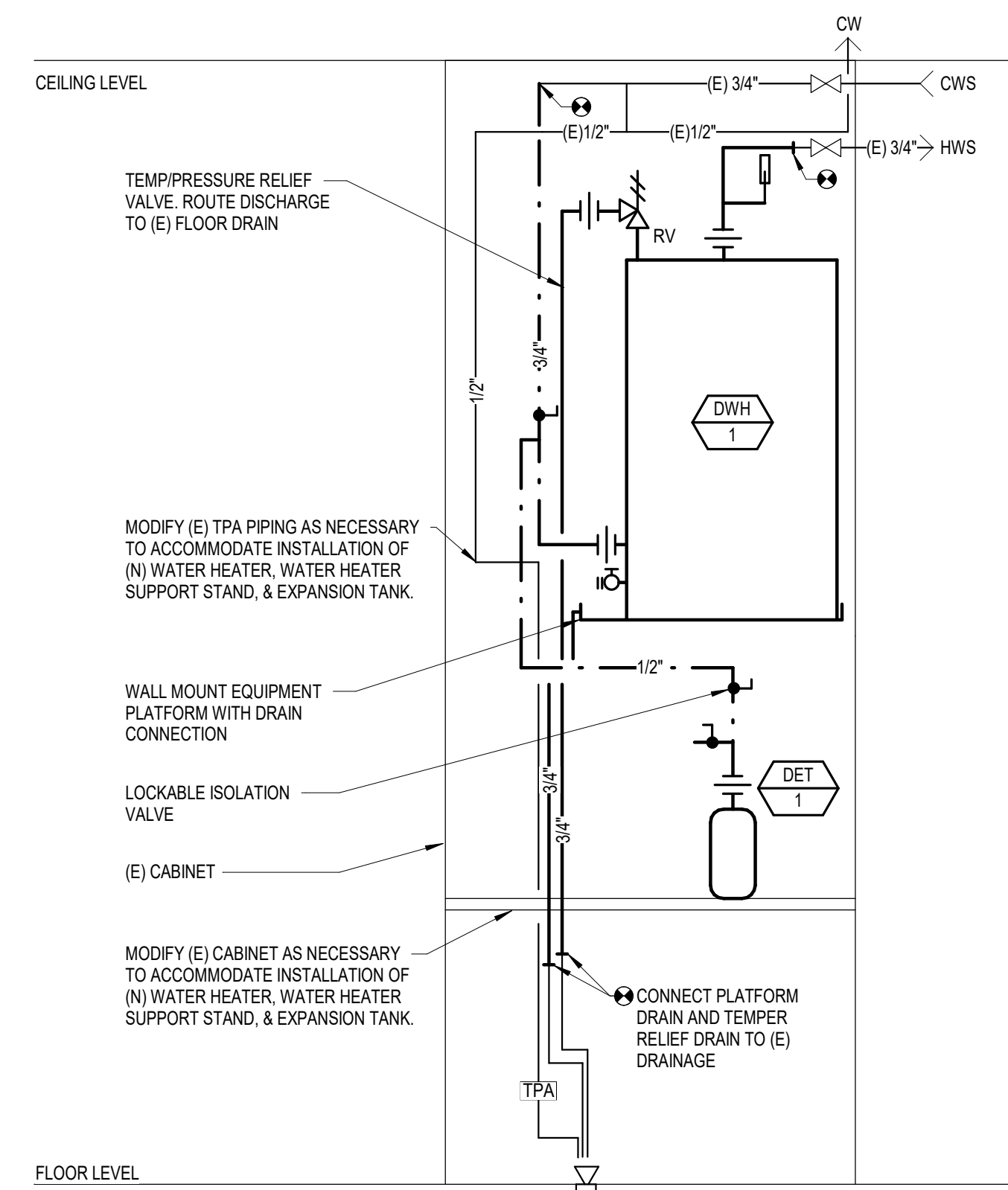
TAG	MANUFACTURER	MODEL	DIA. (IN)	SERVICE	LENGTH (IN)	VOLUME (GAL)	MAX OPERATING WEIGHT (LBS)	REMARKS
ET-1	WATTS	DETA 5	10	DOMESTIC HOT WATER	14	3.5	52	-



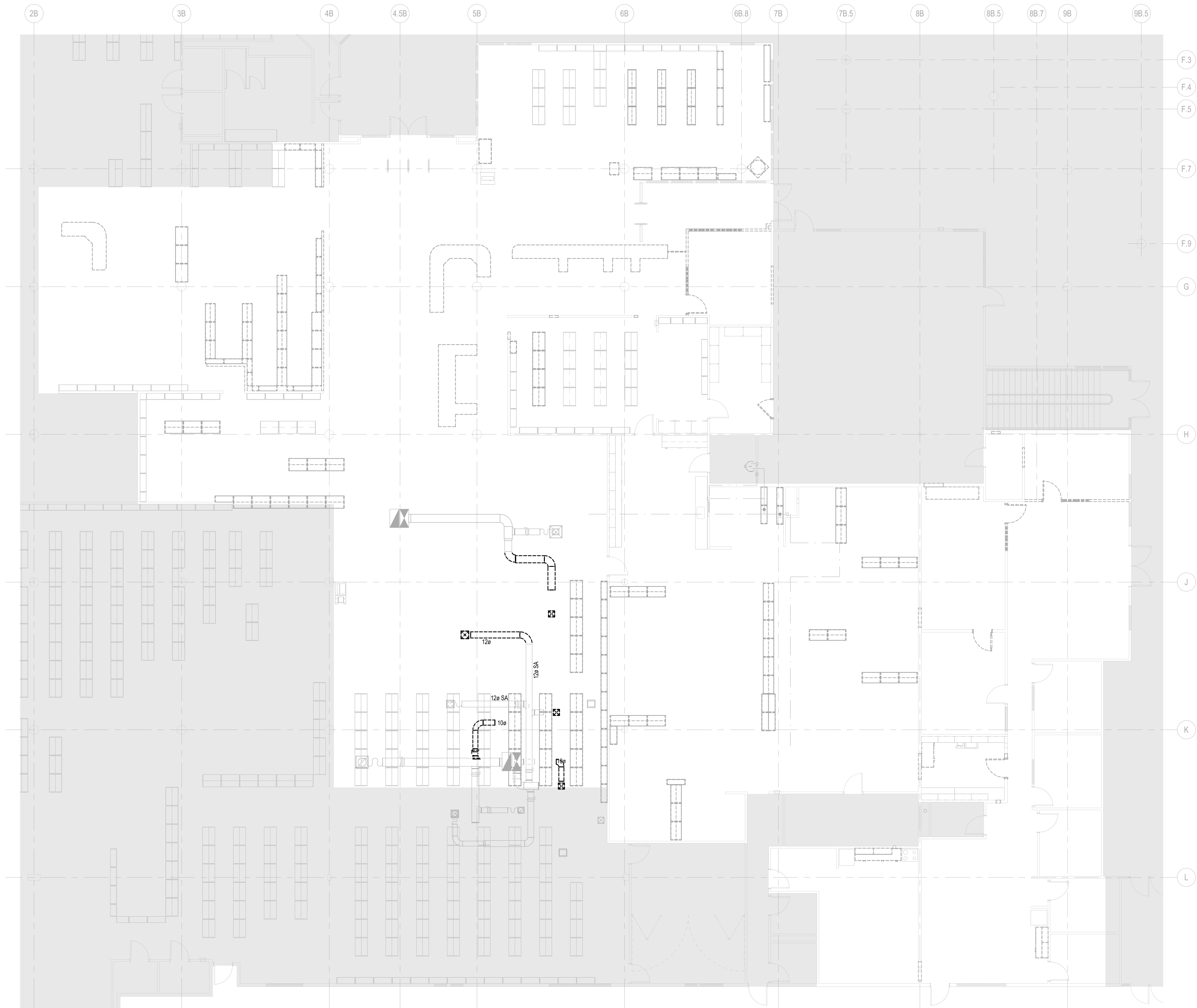
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NOT TO SCALE



2 WALL PENETRATION - FLOOR PIPING
NOT TO SCALE

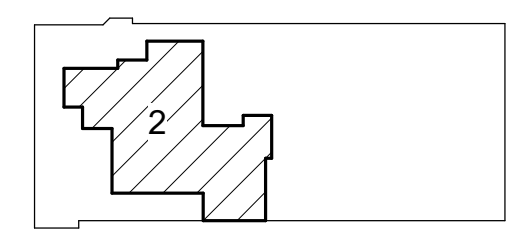


3 DOMESTIC WATER HEATER - ELECTRIC
NOT TO SCALE



1 DEMOLITION PLAN - LIBRARY

1/8" = 1'-0"



KEYPLAN



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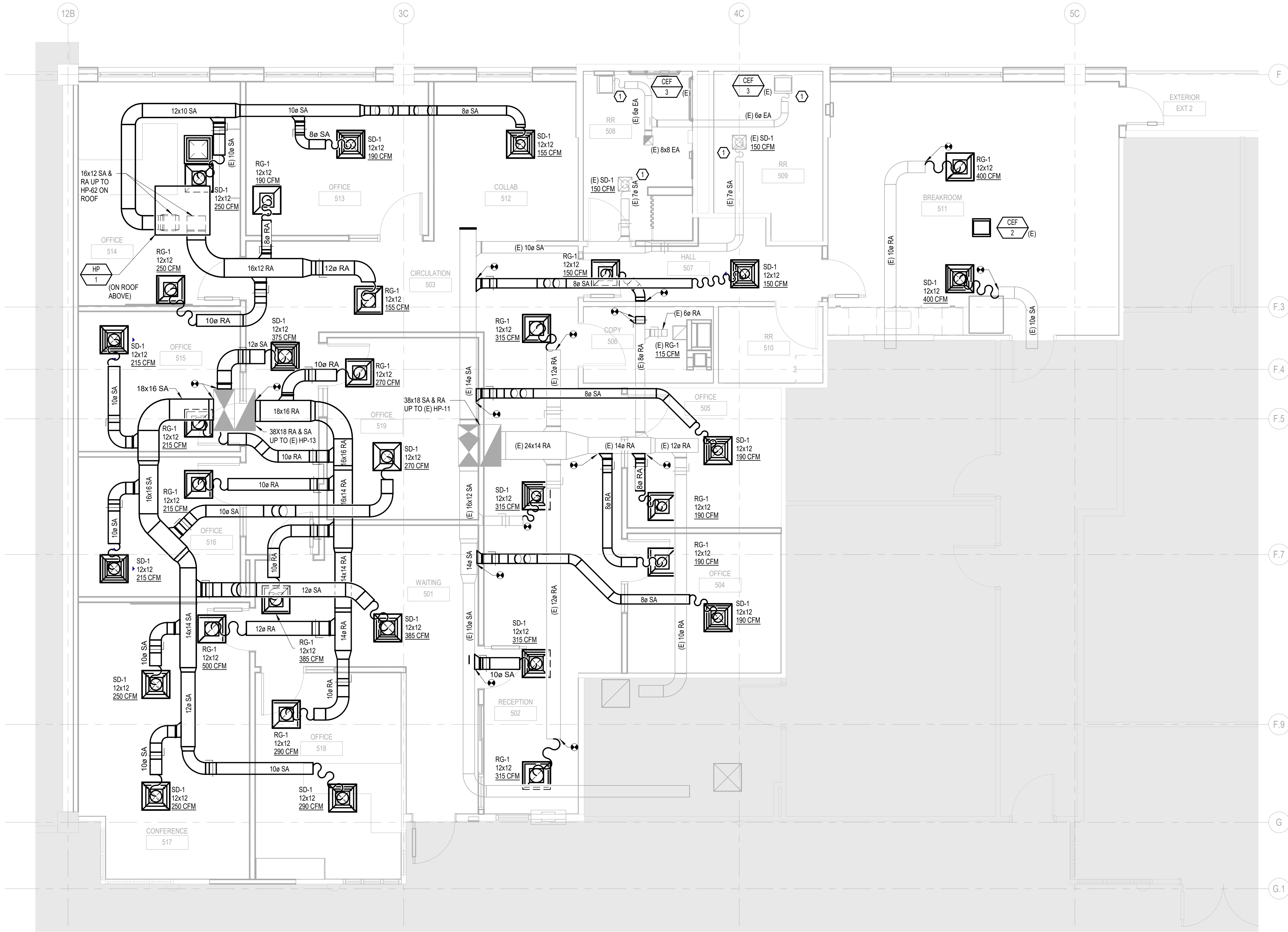
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DEMOLITION PLAN - LIBRARY

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M102



REFERENCE NOTES:

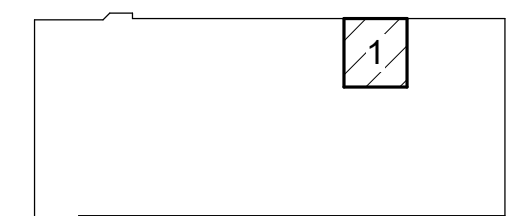
- ① SHIFT DIFFUSER OR FAN TO ALIGN WITH NEW CEILING GRID. MODIFY DUCTWORK AS REQUIRED TO ACCOMMODATE SHIFT.



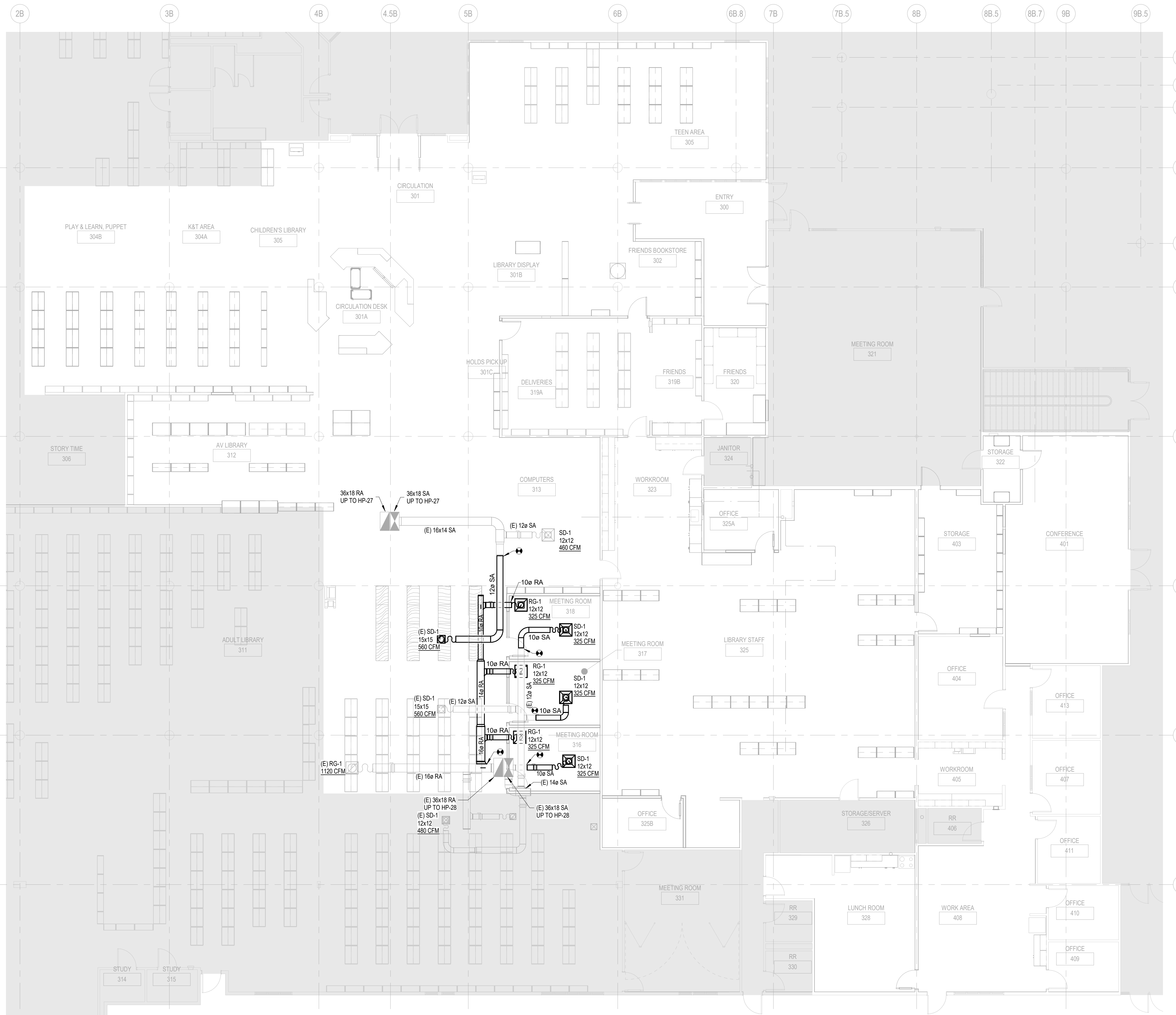
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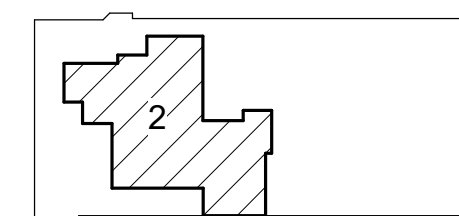
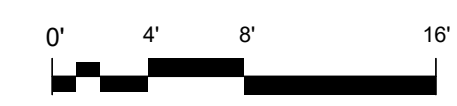
1 FLOOR PLAN - CM OFFICE
 1/4" = 1'-0"



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1 FLOOR PLAN - LIBRARY
1/8" = 1'-0"



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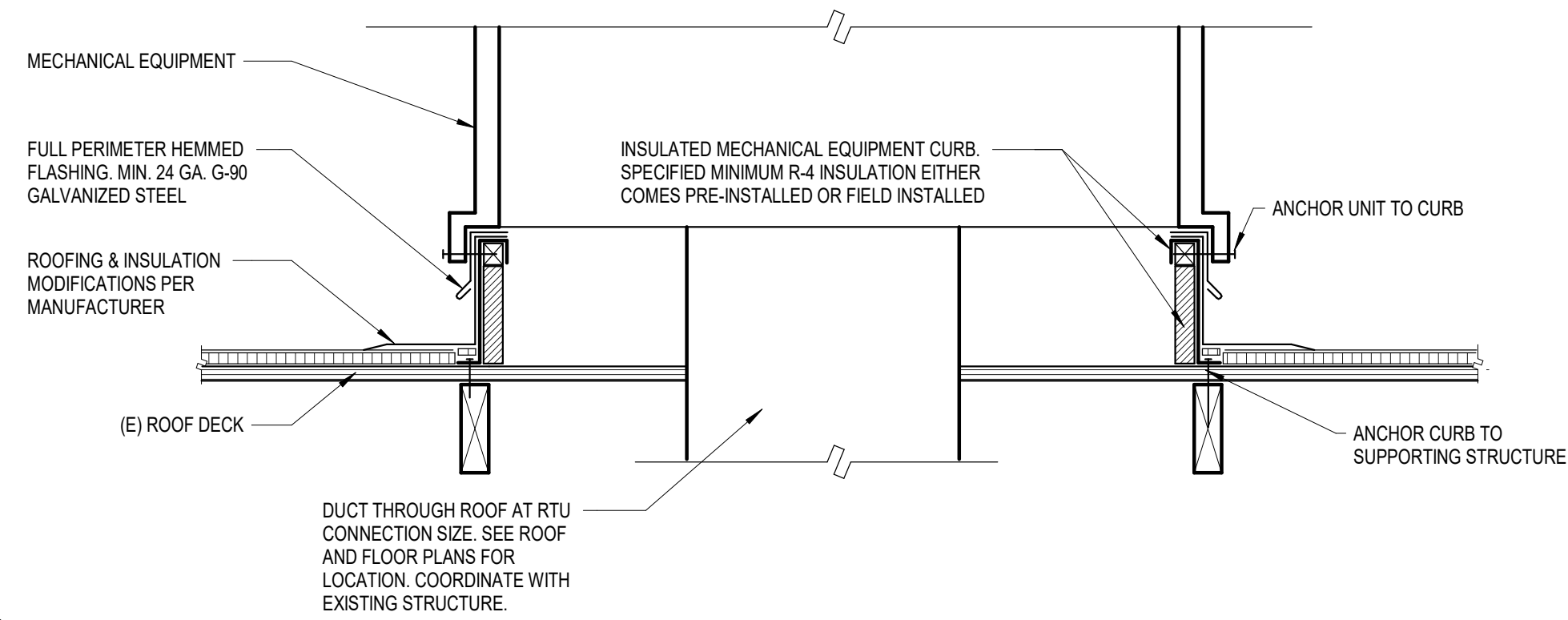
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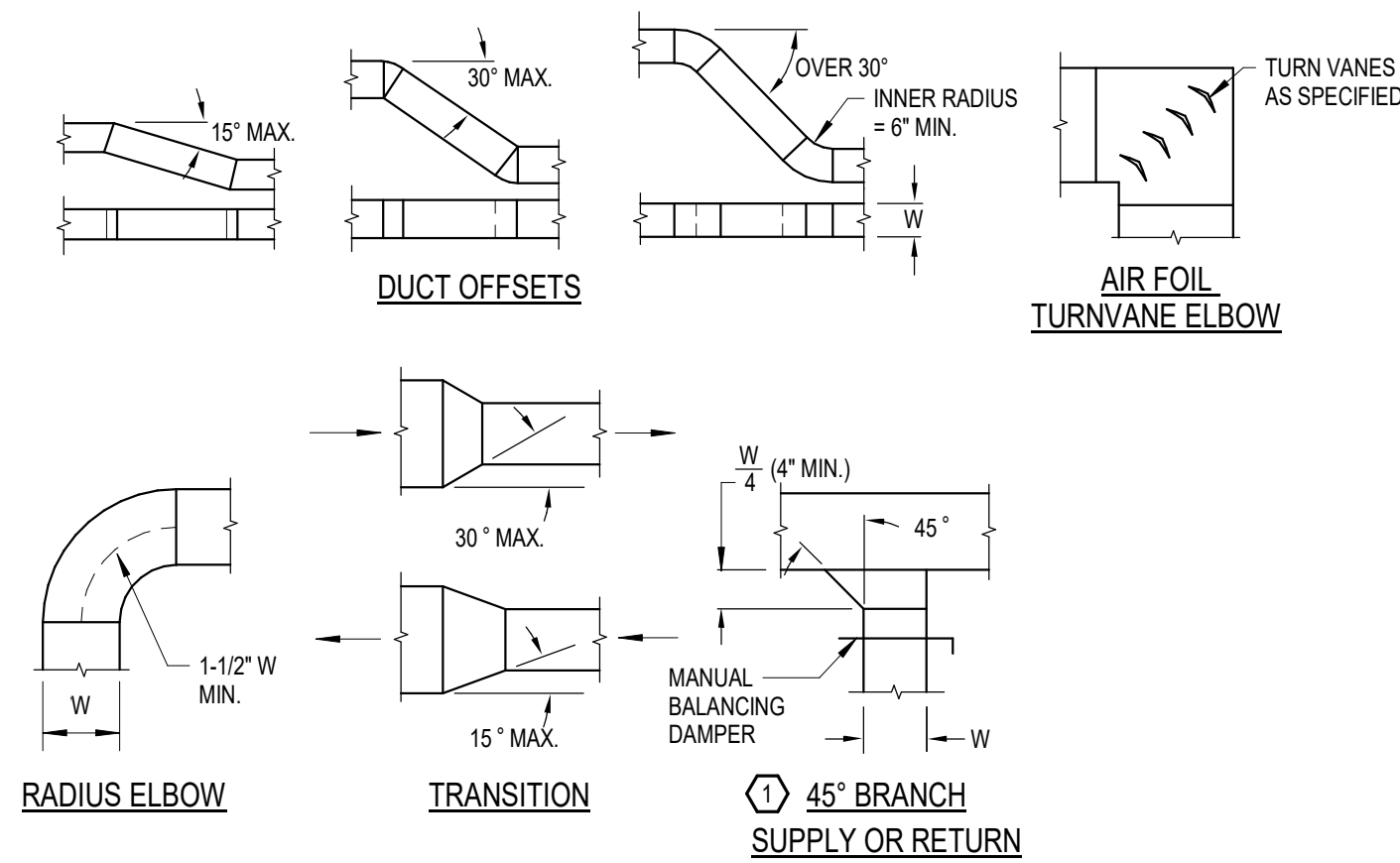
REVISIONS:

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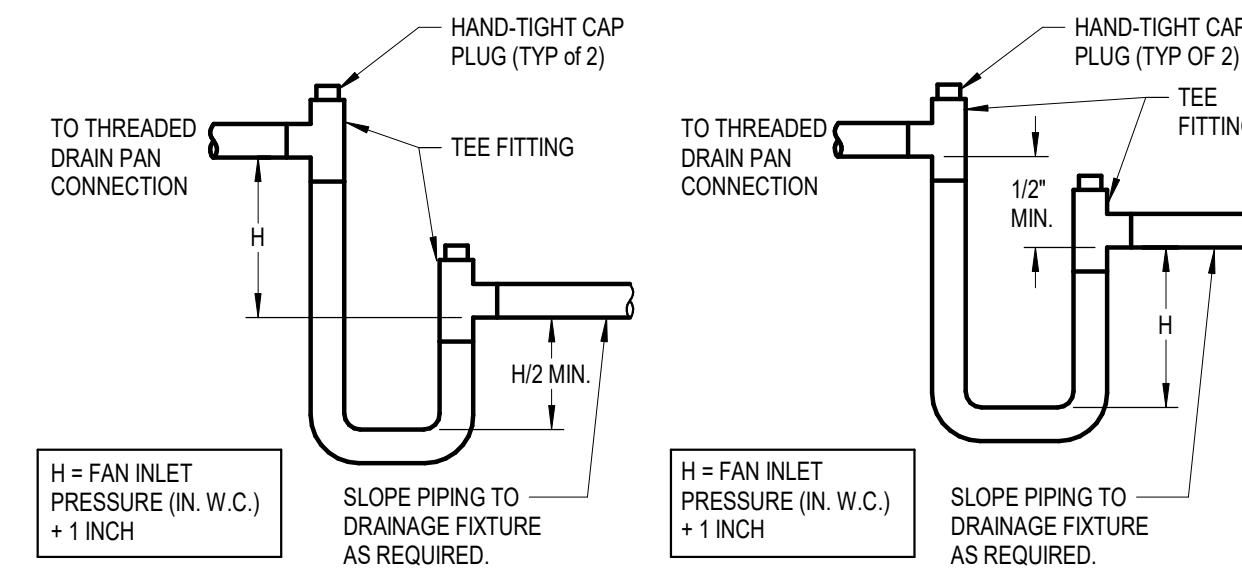
1 RTU CURB
NOT TO SCALE



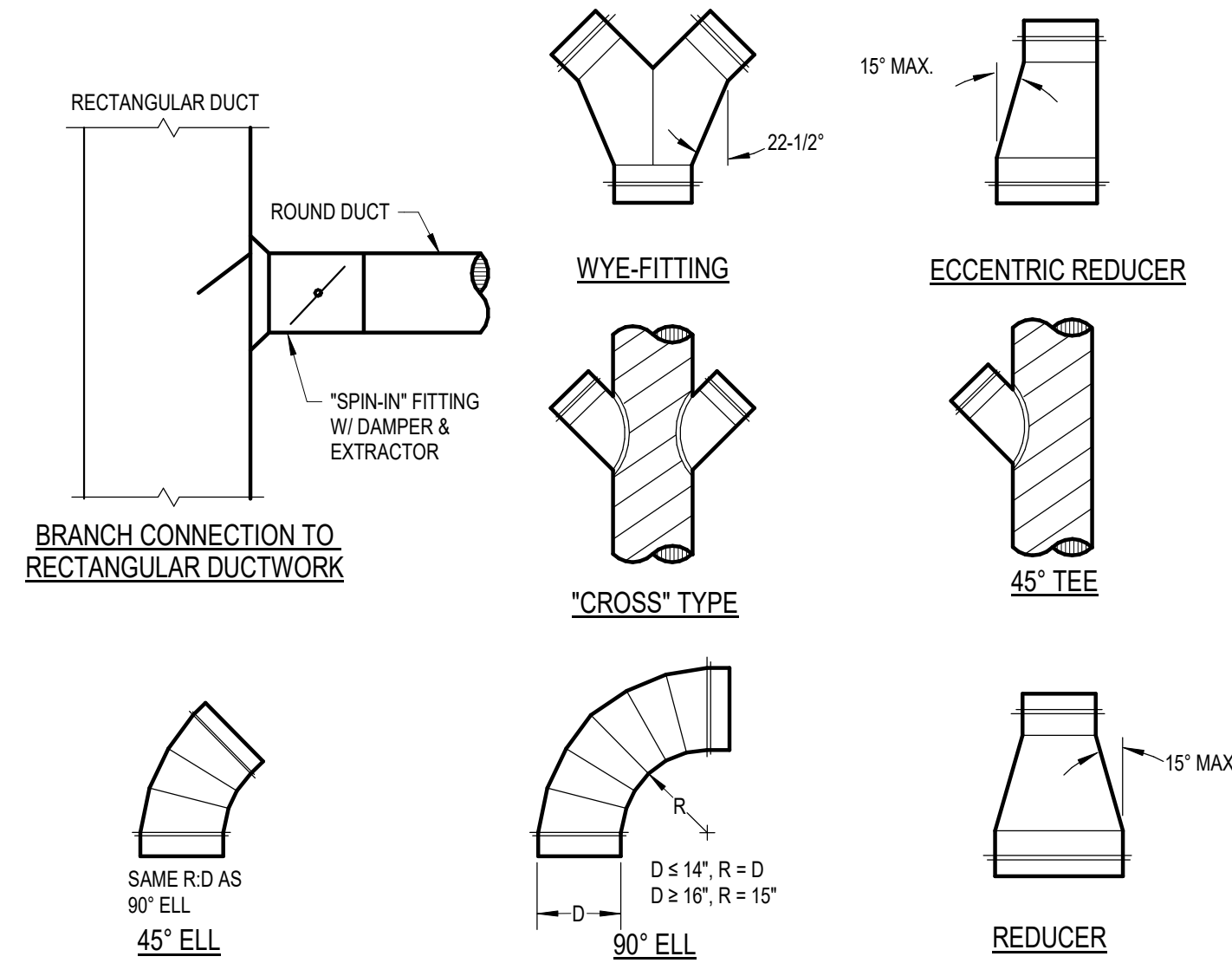
DETAIL NOTES:

- DUCT LINER NOT SHOWN FOR CLARITY.
 - FOR ADDITIONAL DETAIL, DUCTWORK SHALL BE CONSTRUCTED PER 2005 SMACNA HVAC DUCT CONSTRUCTION STANDARDS.
 - DUCT OFFSETS AND TRANSITIONS MAY CONVERT DUCT PROFILES TO ANY COMBINATION FOR RECTANGULAR, ROUND OR FLAT OVAL SHAPES.
- ① PROVIDE AIR EXTRACTOR WITH EXTERNAL OPERATING KNOB WHERE 45° BRANCH TAKEOFF CANNOT BE INSTALLED.

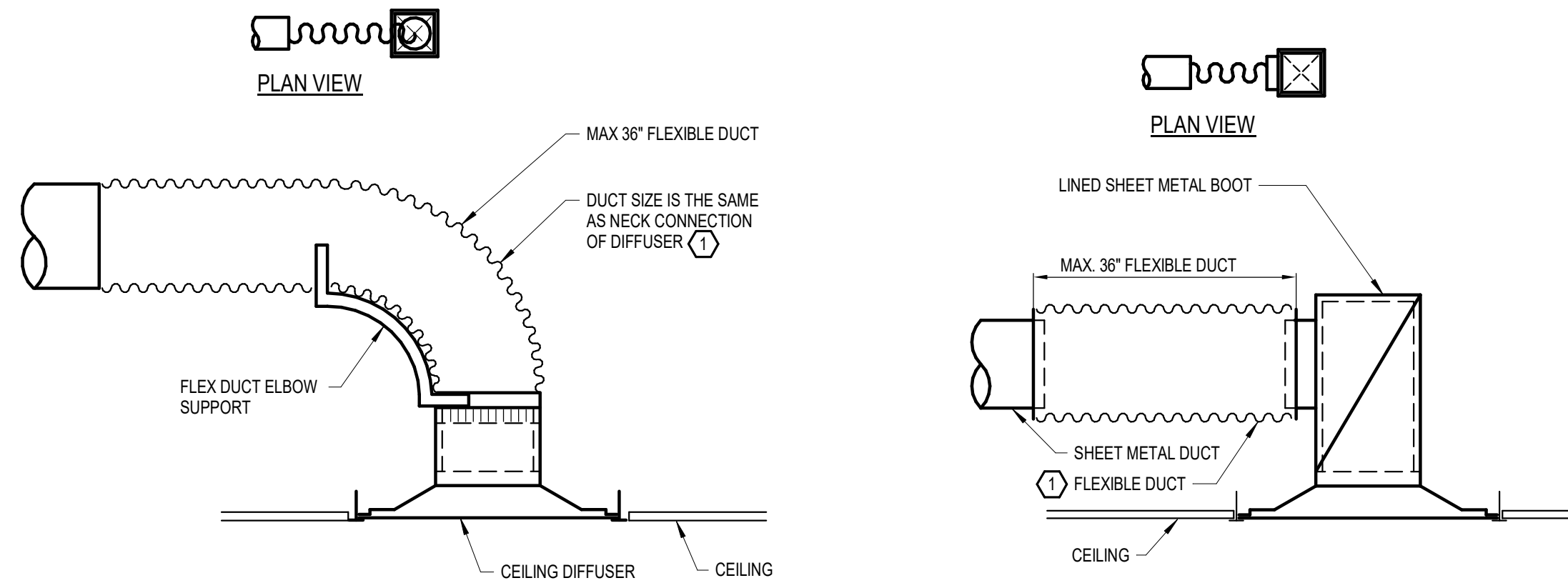
3 DUCT CONSTRUCTION
NOT TO SCALE



2 CONDENSATE DRAIN CONNECTION
NOT TO SCALE



4 ROUND DUCT CONSTRUCTION
NOT TO SCALE



5 DIFFUSER GRILL & REGISTER CONNECTION
NOT TO SCALE

- ① MAXIMUM OFFSET IN HORIZONTAL AND VERTICAL PLANE TO BE 15" FOR FLEXIBLE DUCT CONNECTION TO DIFFUSER BOOT COLLAR. FASTEN FLEXIBLE DUCT TO SHEET METAL DUCT PER SPECIFICATIONS.



HEAT PUMP - OUTDOOR UNIT

TAG	MANUFACTURER	MODEL	AIRFLOW [CFM]	PERFORMANCE				ELECTRICAL				REMARKS
				HEATING CAPACITY [MBH]	COOLING CAPACITY [MBH]	HSPR	SEER	VOLTS	PHASE	MCA (1)	MBS (2)	
HP-62	TRANE	#4WWC4024	780	22	24.6	8	14	208	1	19	30	ON ROOF ABOVE

ROOM VENTILATION SCHEDULE

Tag No.	Room ID	Room Name	Occupancy Classification	Area (ft2) (Az)	No. of Occupants	Occupant Diversity Factor (%)	Zone Population (Pz)	Outdoor air flow (per person) Rp	Outdoor air flow (per unit area) Ra	Breathing Zone Outdoor Air Flow Vbz (cfm)	Zone Air Distribution Effectiveness (Ez)	Zone Outside Air (Voz)	Primary Zone Airflow Min (Vpz)	Primary Zone Airflow (Vpz)	Primary Outdoor Air Fraction (Zp)
HP-11	501	Waiting	Office space	204	2	100	2	5	0.06	22	0.80	27.80	42	385	0.07
HP-11	502	Reception	Office space	68	1	100	1	5	0.06	9	0.80	11.35	17	315	0.04
HP-11	503a	Circulation	Office space	308	2	100	2	5	0.06	28	0.80	35.60	53	315	0.11
HP-13	503b	Circulation	Office space	157	1	100	1	5	0.06	14	0.80	18.03	27	375	0.05
HP-11	504	Office	Office space	110	1	100	1	5	0.06	12	0.80	14.50	22	190	0.08
HP-11	505	Office	Office space	110	1	100	1	5	0.06	12	0.80	14.50	22	190	0.08
HP-11	507	Hall	Reception areas	78	1	100	1	5	0.06	10	0.80	12.10	18	150	0.08
HP-11	508	Restroom	Office space	93	1	100	1	5	0.06	11	0.80	13.23	20	150	0.09
HP-11	509	Restroom	Office space	87	1	100	1	5	0.06	10	0.80	12.78	19	150	0.09
HP-62	512	Collab	Office space	117	1	100	1	5	0.06	12	0.80	15.03	23	155	0.10
HP-62	513	Office	Office space	143	1	100	1	5	0.06	14	0.80	16.98	25	190	0.09
HP-62	514	Office	Office space	186	1	100	1	5	0.06	16	0.80	20.20	30	250	0.08
HP-13	515	Office	Office space	116	1	100	1	5	0.06	12	0.80	14.95	22	215	0.07
HP-13	516	Office	Office space	116	1	100	1	5	0.06	12	0.80	14.95	22	215	0.07
HP-13	517	Conference	Conference/meeting	234	12	100	12	5	0.06	74	0.80	92.55	139	500	0.19
HP-13	518	Office	Office space	155	1	100	1	5	0.06	14	0.80	17.88	27	290	0.06
HP-13	519	Office	Office space	141	1	100	1	5	0.06	13	0.80	16.83	25	270	0.06
HP-28	316	Conference	Conference/meeting	148	8	50	8	5	0.06	49	0.80	36	54	325	0.11
HP-28	317	Conference	Conference/meeting	148	8	50	8	5	0.06	49	0.80	36	54	325	0.11
HP-28	318	Conference	Conference/meeting	148	8	50	8	5	0.06	49	0.80	36	54	325	0.11
HP-28	312	Library	Libraries	740	37	50	37	5	0.12	274	0.80	227	340	1040	0.22

HEAT PUMP VENTILATION

Equipment	Vst = Sum of Total Supply Air	Von = Sum of OSA Flows	System Ventilation Efficiency	Corrected OSA Volume
HP-62	595	42	0.75	56
HP-13	1865	140	0.75	187
HP-11	1845	113	0.75	151
HP-28	2015	268	0.66	406



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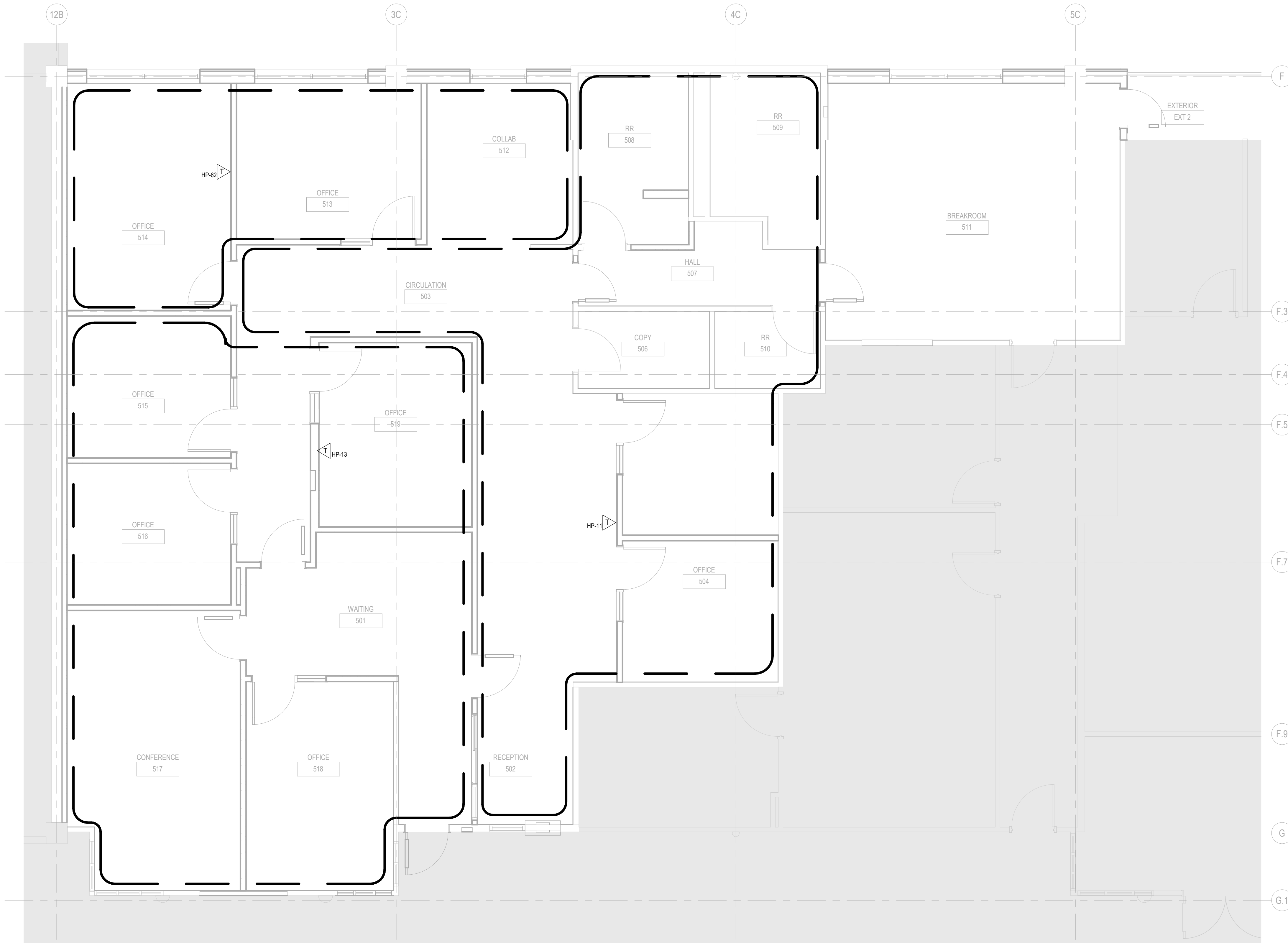
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SHEET TITLE:
SCHEDULES

REVISIONS:
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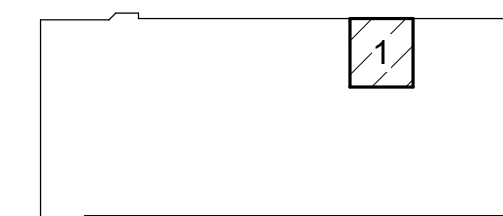
M601



SHEET NOTES:
1. COORDINATE EXACT THERMOSTAT LOCATIONS WITH ARCHITECT AND ENGINEER.

1 ZONE PLAN - CM OFFICE

1/4" = 1'-0"



KEYPLAN



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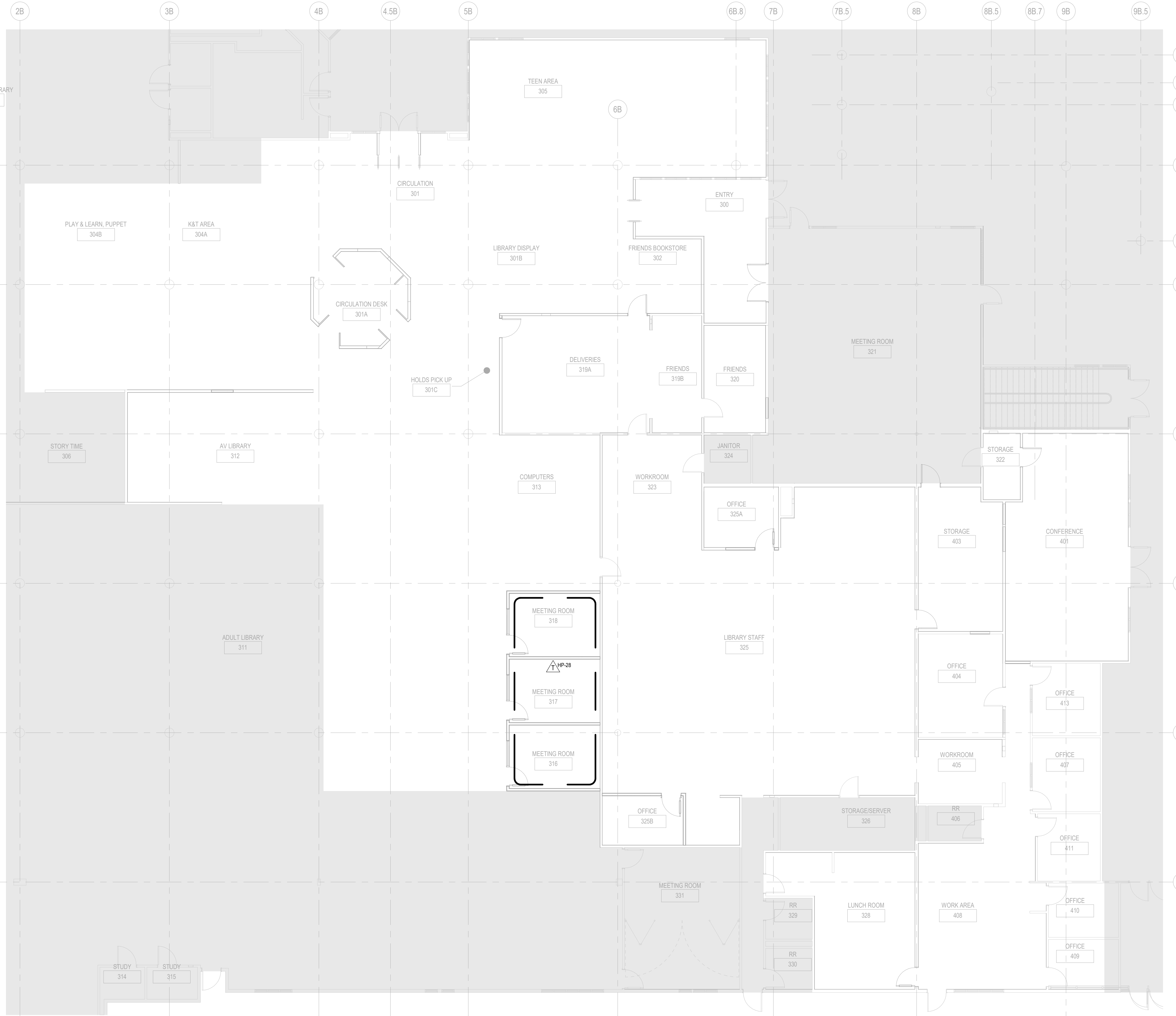
CONSTRUCTION DRAWINGS
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SHEET TITLE:
ZONE PLAN - CM OFFICE

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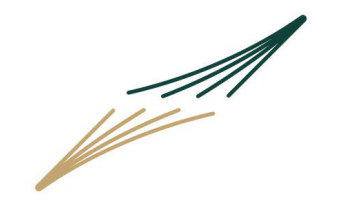
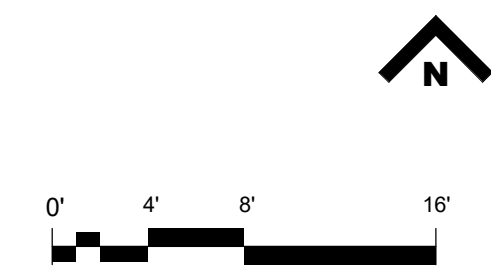
M701



SHEET NOTES:
 1. COORDINATE EXACT THERMOSTAT LOCATIONS WITH ARCHITECT AND ENGINEER.

F.3
F.4
F.5
F.7
F.9
G
H
J
K
L

1 ZONE PLAN - LIBRARY
 1/8" = 1'-0"



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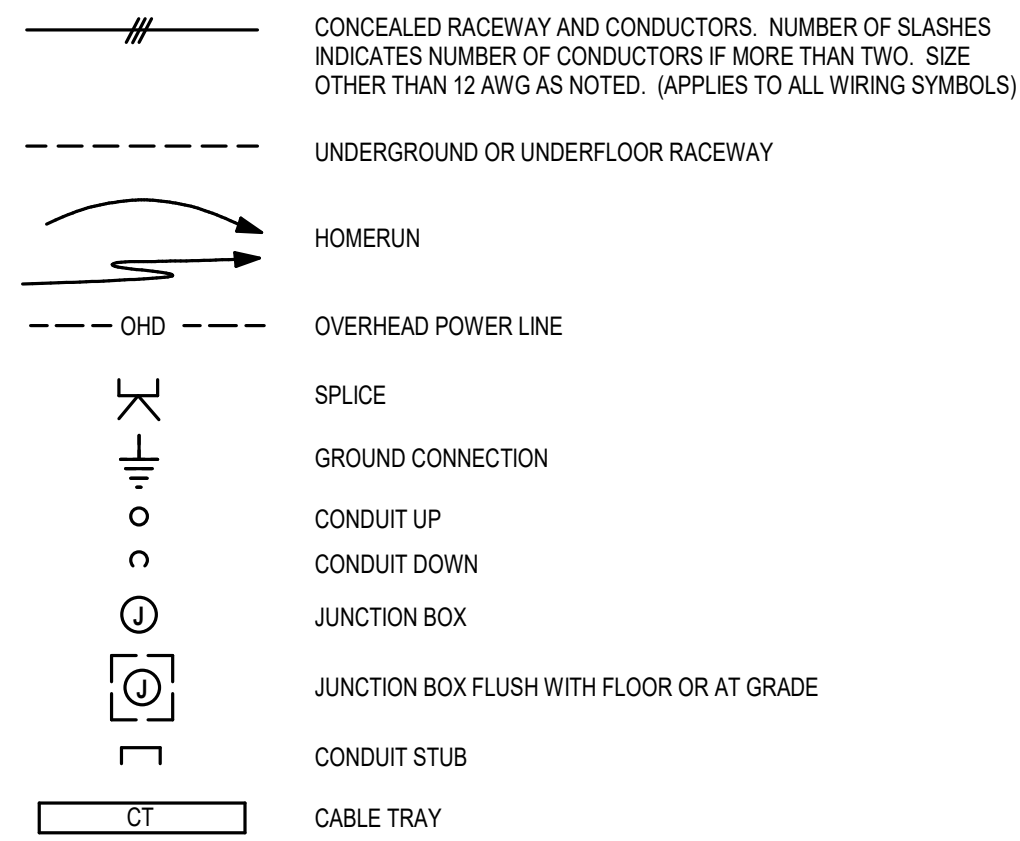
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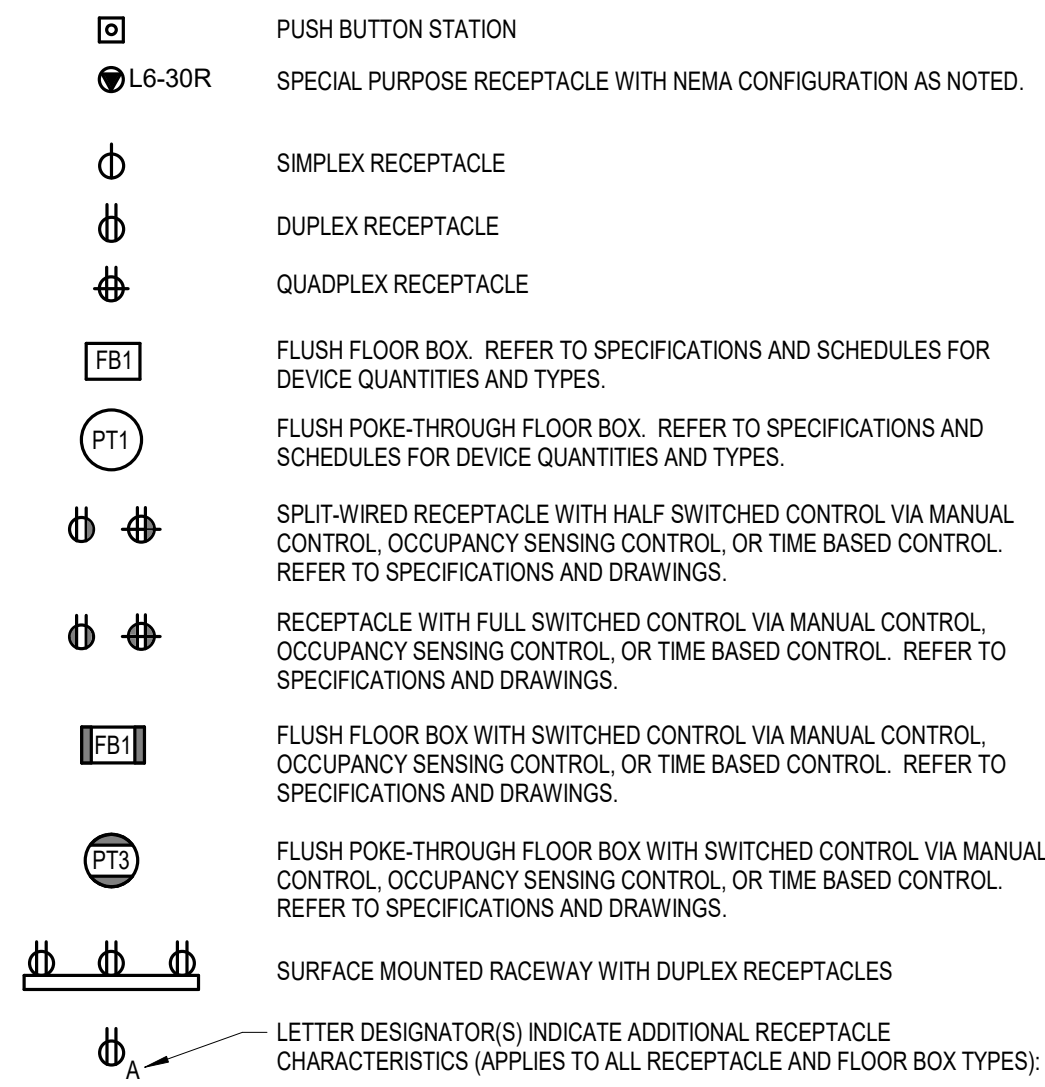
M702

ELECTRICAL LEGEND

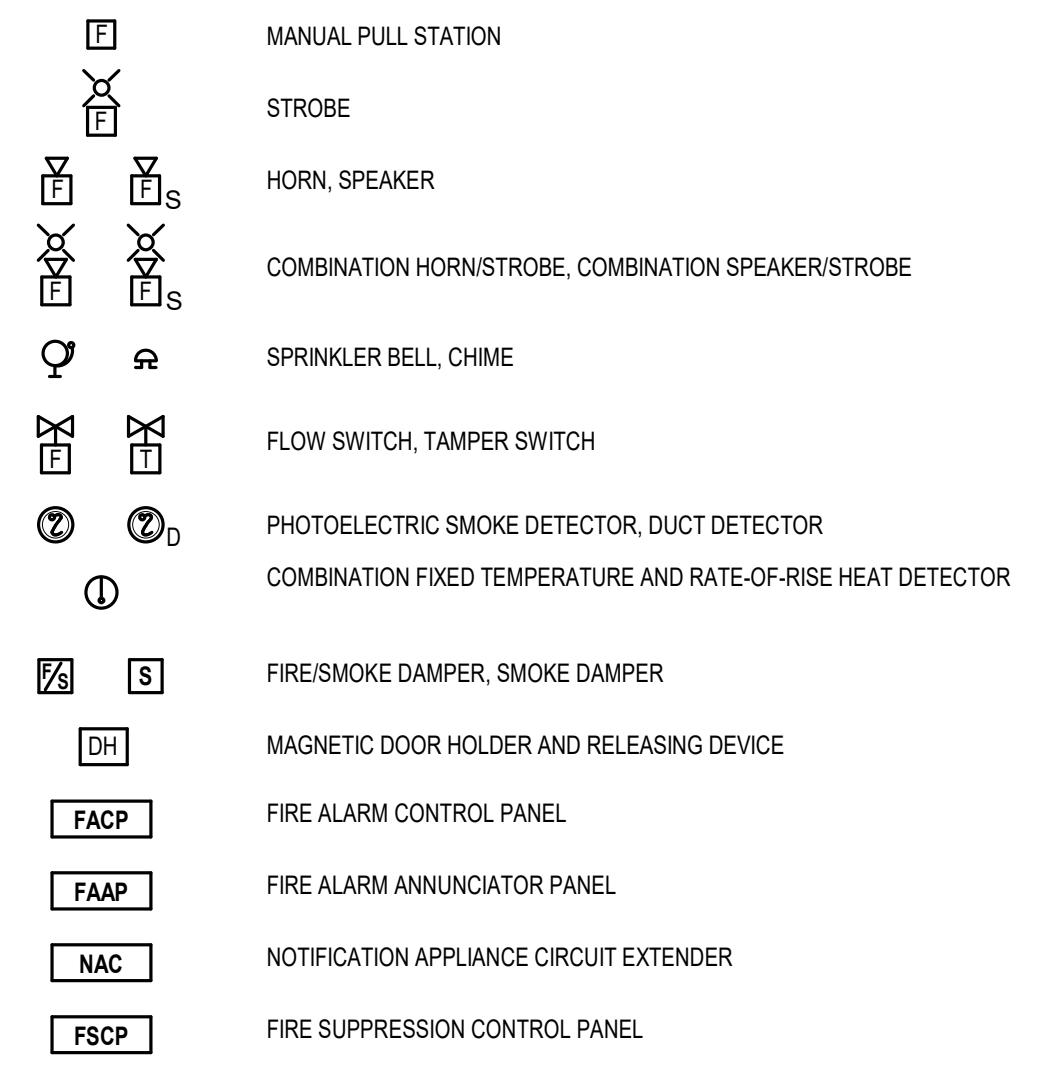
RACEWAYS, BOXES, AND CONDUCTORS



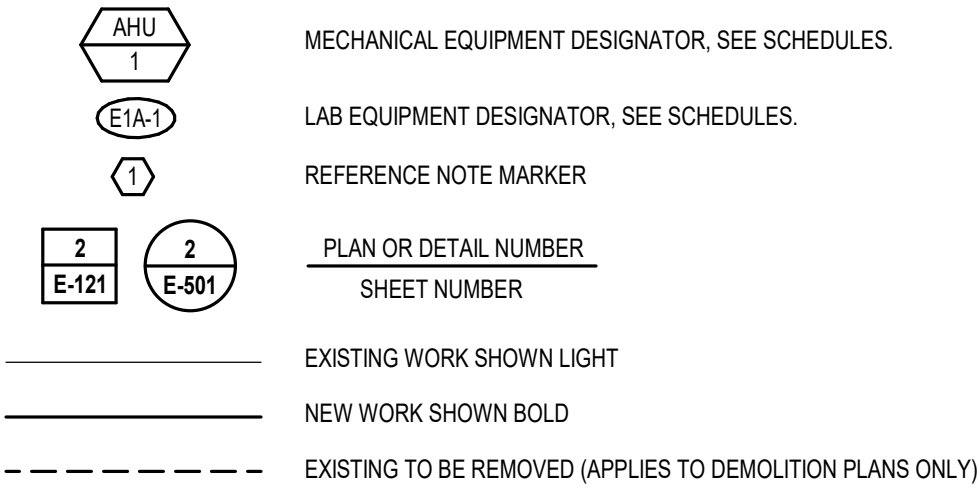
WIRING DEVICES



FIRE ALARM



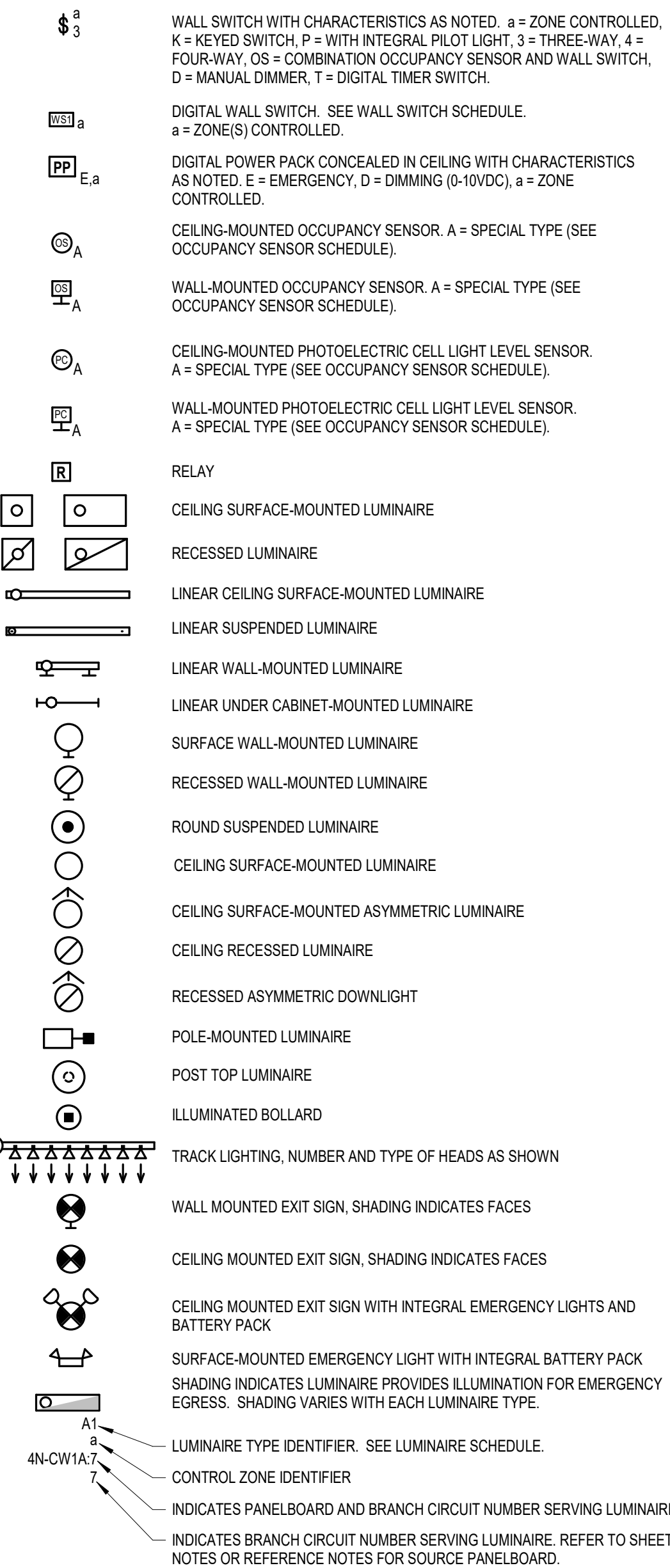
GENERAL



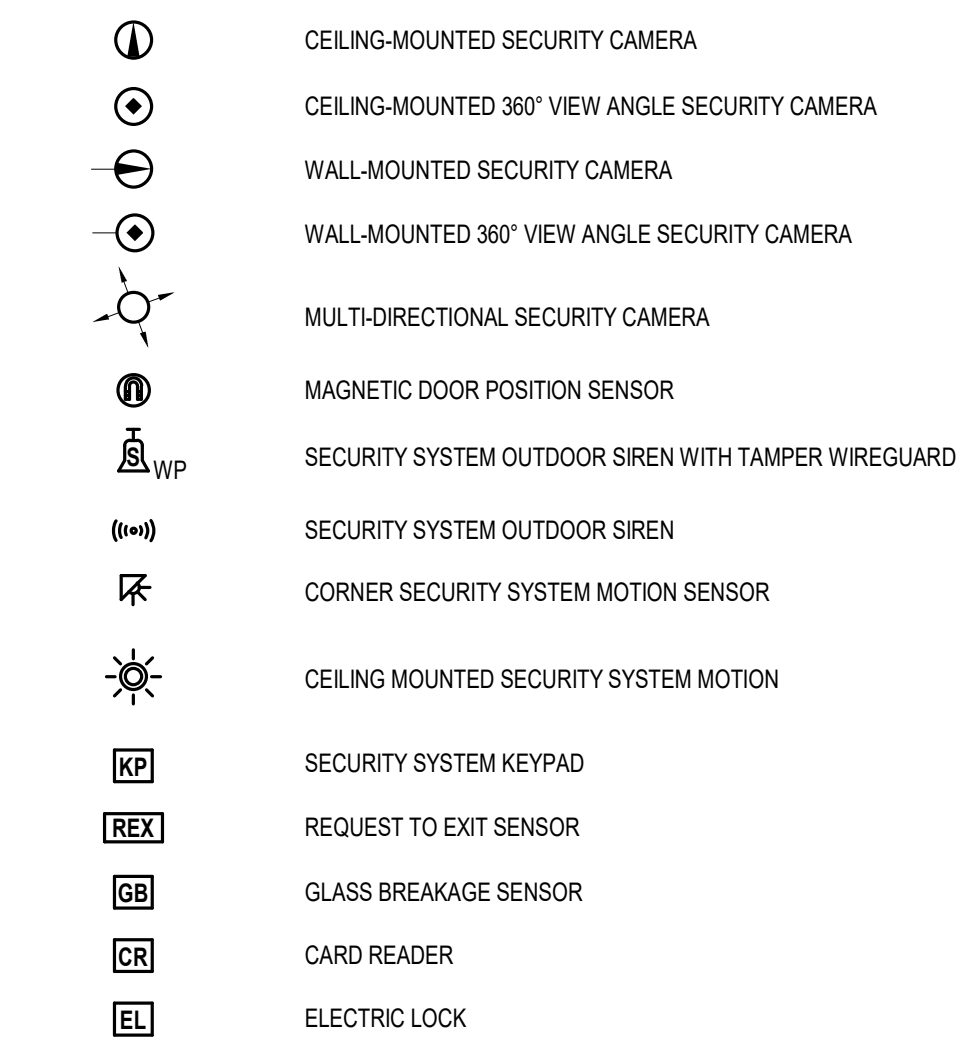
ABBREVIATIONS

(#)	DESIGNATES QUANTITY	LV	LOW VOLTAGE
A	AMPERE (AMP)	LSI	LSI ELECTRONIC TRIP UNIT
AC	ALTERNATING CURRENT	LSIG	LSIG ELECTRONIC TRIP UNIT
AFC	AVAILABLE FAULT CURRENT	LTG	LIGHTING
AFF	ABOVE FINISHED FLOOR	MCA	MINIMUM CIRCUIT AMPACITY
AFG	ABOVE FINISHED GRADE	MCB	MAIN CIRCUIT BREAKER
AL	ALUMINUM	MCC	MOTOR CONTROL CENTER
ARCH	ARCHITECT/ARCHITECTURAL	MDF	MAIN DISTRIBUTION FRAME
ATS	AUTOMATIC TRANSFER SWITCH	MDS	MAIN DISTRIBUTION SWITCHBOARD
AWG	AMERICAN WIRE GAUGE	MDP	MAIN DISTRIBUTION PANELBOARD
BLDG	BUILDING	MECH	MECHANICAL
BOCT	BOTTOM OF CABLE TRAY	MLO	MAIN LUG ONLY
BSC	BIOLOGICAL SAFETY CABINET	MTS	MAIN TRANSFER SWITCH
C	CONDUIT	MVA	MEGAVOLT-AMPERE
CENT	CENTRIFUGE	MW	MEGAWATT
CKT	CIRCUIT	(N)	NEW
CL	CENTERLINE	(NL)	NEW LOCATION
CLG	CEILING	NA	NOT APPLICABLE
CRI	COLOR RENDERING INDEX	NIC	NOT IN CONTRACT
CU	COPPER	PA	PUBLIC ADDRESS
DC	DIRECT CURRENT	PE	PHOTOELECTRIC CELL
E	EMERGENCY	PF	POWER FACTOR
EMERG	EMERGENCY	PNL	PANEL BOARD
EMT	ELECTRICAL METALLIC TUBING	PV	PHOTOVOLTAIC
FA	FIRE ALARM	PVC	POLYVINYL CHLORIDE
FH	FUME HOOD	R	REMOVE
FLA	FULL LOAD AMPS	(RL)	RELOCATE
FTL	FEED-THROUGH LUGS	REFL	REFLECTOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER	SCCR	SHORT CIRCUIT CURRENT RATING
GFP	GROUND FAULT PROTECTION	SDP	SUB-DISTRIBUTION PANELBOARD
GND	GROUND	SWBD	SWITCHBOARD
HP	HORSEPOWER	TR	TAMPER RESISTANT
IDF	INTERMEDIATE DISTRIBUTION FRAME	TTB	TELEPHONE TERMINAL BOARD
INC	INCUBATOR	TV	TELEVISION
K	KELVIN	TYP	TYPICAL
KW	KILOWATT	UC	UNDER CABINET
KWH	KILOWATT-HOUR	UG	UNDERGROUND
KV	KILOVOLT	UON	UNLESS OTHERWISE NOTED
KVA	KILOVOLT-AMPERE	UPS	UNINTERRUPTIBLE POWER SUPPLY
KVAR	KILOVOLT-AMPERE REACTIVE	V	VOLTAGE
LED	LIGHT EMITTING DIODE	VA	VOLT-AMPERE
LM	LUMENS	VP	VAPOR PROOF
		WP	WEATHERPROOF
		XFMR	TRANSFORMER

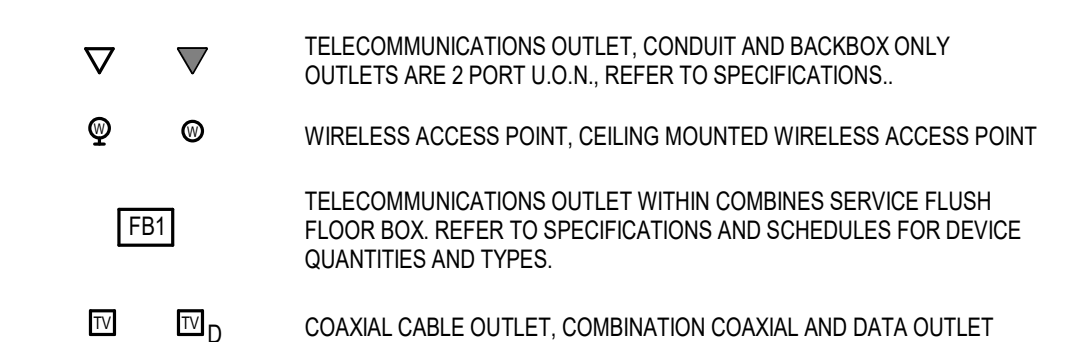
LIGHTING



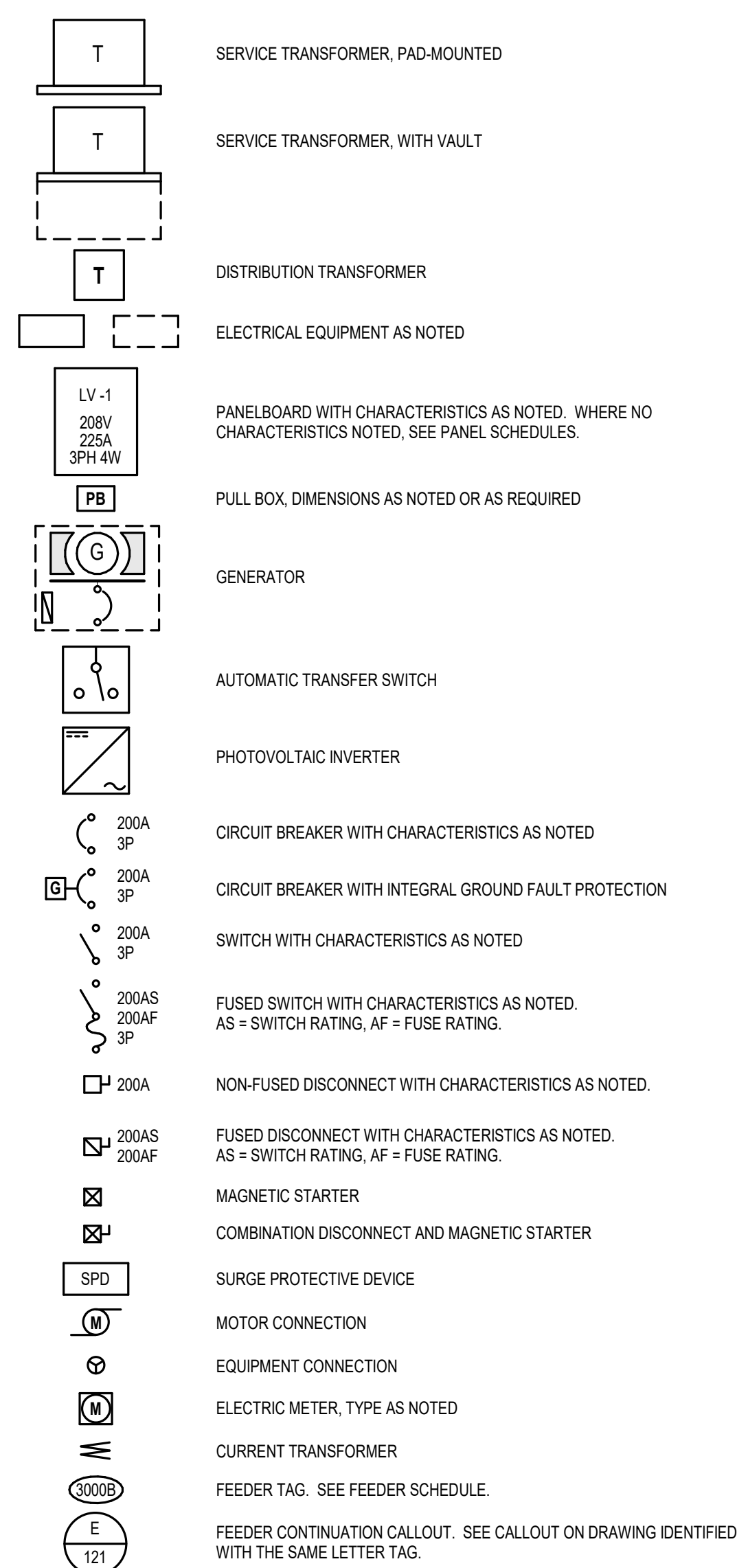
SECURITY AND ACCESS CONTROL



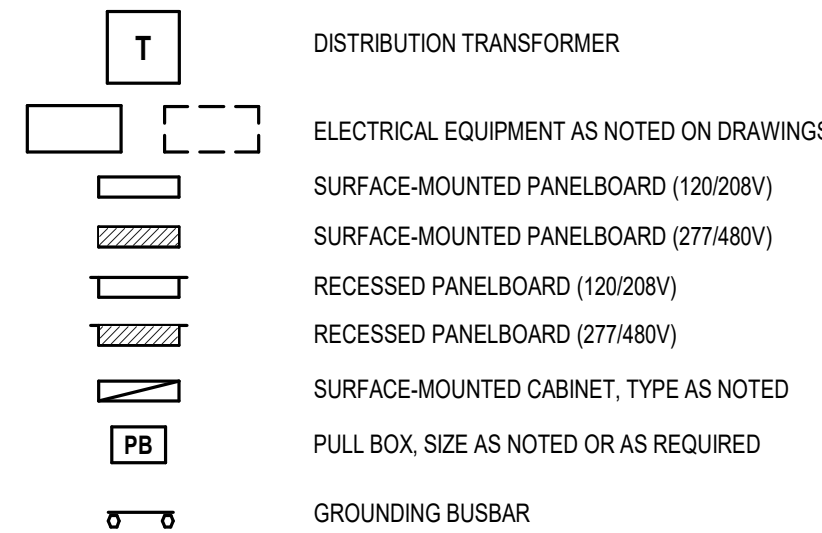
TELECOMMUNICATIONS



ONE-LINE DIAGRAM



ELECTRICAL EQUIPMENT - PLANS



SHEET LIST - ELECTRICAL

E001	LEGEND, GENERAL NOTES, & SHEET LIST
E101	DEMOLITION PLAN - CM OFFICE
E102	DEMOLITION PLAN - LIBRARY
E103	LIGHTING DEMOLITION PLAN - CM OFFICE
E104	LIGHTING DEMOLITION PLAN - LIBRARY
E111	LIGHTING PLAN - CM OFFICE
E112	LIGHTING PLAN - LIBRARY
E121	FLOOR PLAN - CM OFFICE
E122	FLOOR PLAN - LIBRARY
E601	SCHEDULES
E621	WIRING DIAGRAMS



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 SWE Project # 2005.01

CONSTRUCTION DRAWINGS
SPRINGFIELD CITY HALL RENOVATION
 PROJECT #: 2125.00
 CITY OF SPRINGFIELD
 225 5TH ST, SPRINGFIELD, OR 97477

SHEET TITLE:
LEGEND, GENERAL NOTES, & SHEET LIST

REVISIONS:
 # DESCRP. DATE

ISSUE DATE: 04.10.2023

E001



SHEET NOTES:

1. INFORMATION PRESENTED ON DRAWINGS IS BASED ON LIMITED SITE VISIT OBSERVATIONS AND AS-BUILT DRAWINGS. CONTRACTOR SHALL VERIFY ACTUAL CONDITIONS PRIOR TO COMMENCING WORK.

REFERENCE NOTES:

- ① REMOVE (E) PANEL 'PLA'. RETAIN AND PROTECT BRANCH CIRCUITS CONNECTED TO (E) PANEL 'PLA' FOR RECONNECTION TO REPLACEMENT PANEL IN NEW LOCATION. REFER TO 1/E121, ONE-LINE DIAGRAMS, AND PANEL SCHEDULES FOR ADDITIONAL INFORMATION.
- ② DEMOLISH (E) FEEDERS AND CONDUIT SERVING DEMOLISHED PANELBOARD BACK TO EAST ELECTRICAL ROOM. REFER TO ONE-LINE DIAGRAMS FOR ADDITIONAL INFORMATION.
- ③ DISCONNECT FAN AND RETAIN FOR RELOCATION. PROTECT AND RETAIN EXISTING CIRCUIT FOR USE IN NEW LOCATION. REFERENCE 1/E121 FOR FURTHER INFORMATION.



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SPRINGFIELD CITY HALL RENOVATION
 PROJECT #: 2125.00
 CITY OF SPRINGFIELD
 225 5TH ST, SPRINGFIELD, OR 97477

SHEET TITLE:
DEMOLITION PLAN - CM OFFICE

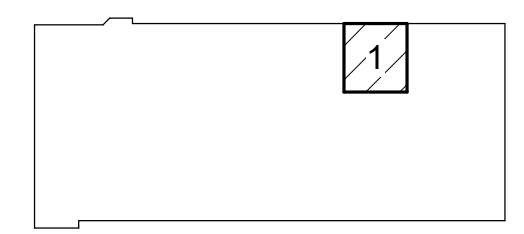
REVISIONS:

#	DESCRP.	DATE

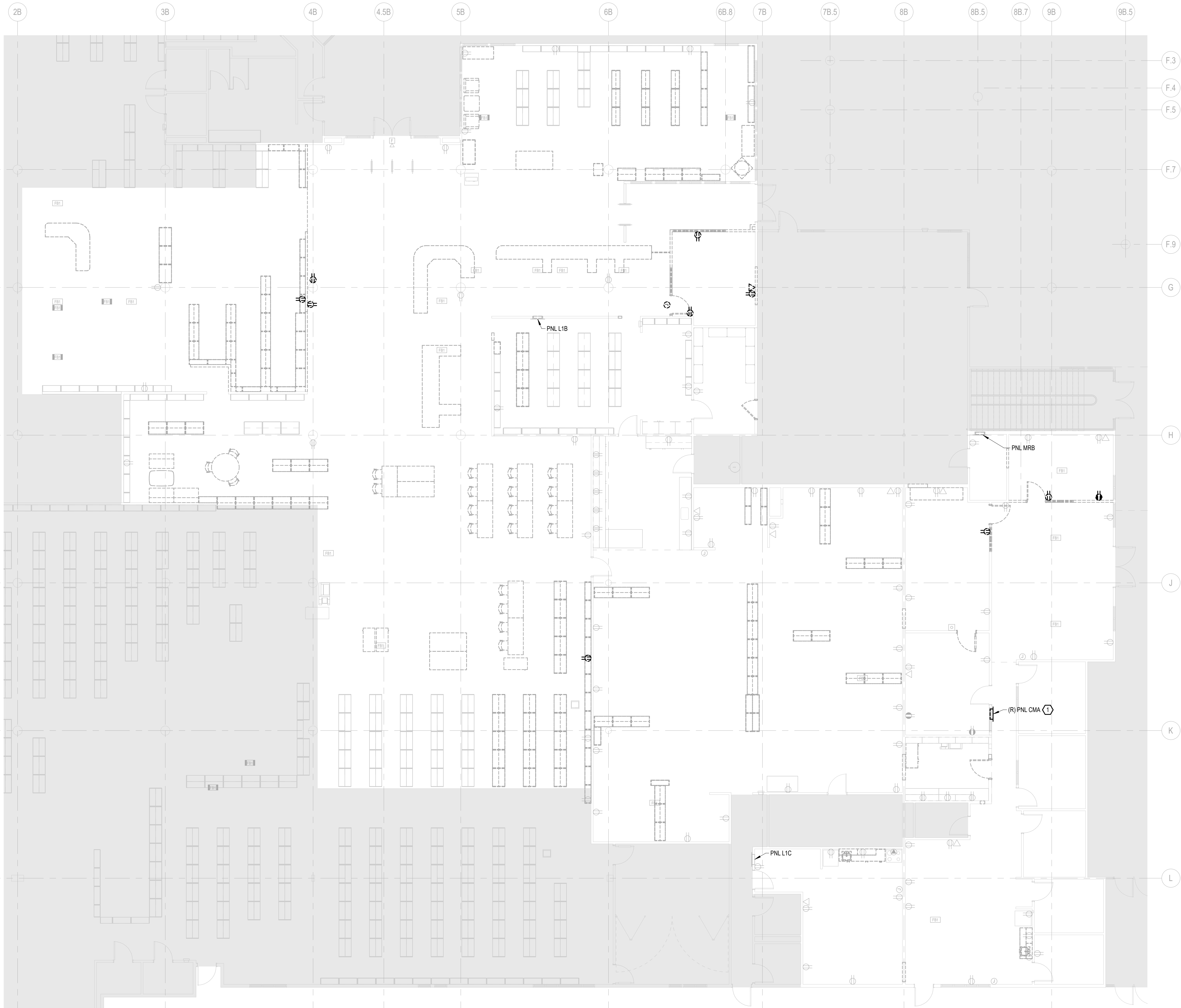
ISSUE DATE: 04.10.2023

E101

1 DEMOLITION PLAN - CM OFFICE
 1/4" = 1'-0"



KEYPLAN

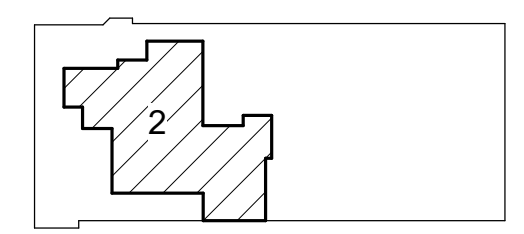


SHEET NOTES:

1. INFORMATION PRESENTED ON DRAWINGS IS BASED ON LIMITED SITE VISIT OBSERVATIONS AND AS-BUILT DRAWINGS. CONTRACTOR SHALL VERIFY ACTUAL CONDITIONS PRIOR TO COMMENCING WORK.

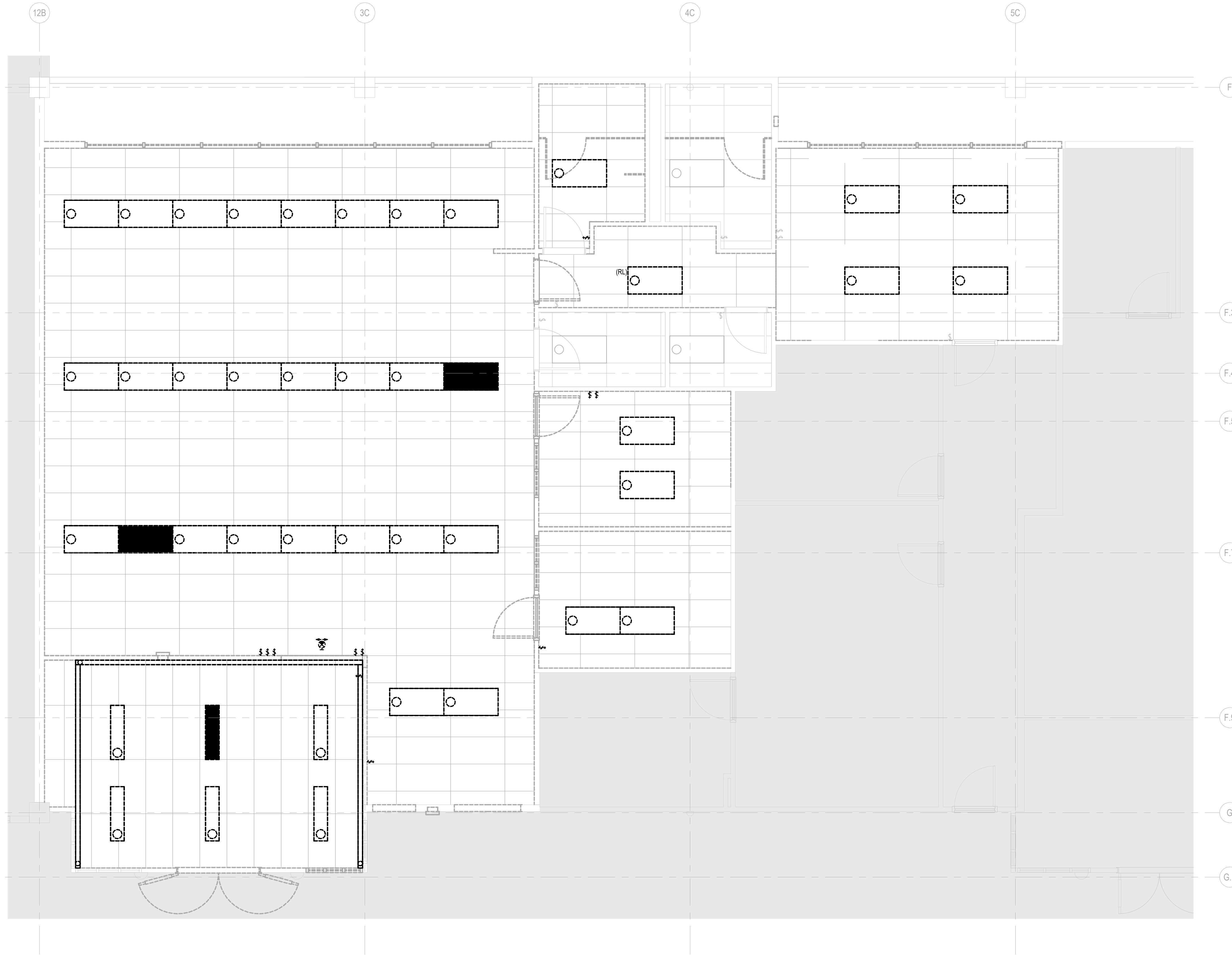
REFERENCE NOTES:

1. REMOVE (E) PANEL 'CMA'. RETAIN AND PROTECT BRANCH CIRCUITS CONNECTED TO (E) PANEL 'CMA' FOR RECONNECTION TO REPLACEMENT PANEL IN SAME LOCATION. REFER TO 1/E122, ONE-LINE DIAGRAMS, AND PANEL SCHEDULES FOR ADDITIONAL INFORMATION.



1 DEMOLITION PLAN - LIBRARY

1/8" = 1'-0"



SHEET NOTES:

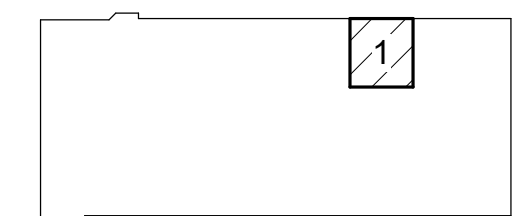
1. INFORMATION PRESENTED ON DRAWINGS IS BASED ON LIMITED SITE VISIT OBSERVATIONS AND AS-BUILT DRAWINGS. CONTRACTOR SHALL VERIFY ACTUAL CONDITIONS PRIOR TO COMMENCING WORK.



REVISIONS:

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1 LIGHTING - CM OFFICE
1/4" = 1'-0"



KEYPLAN

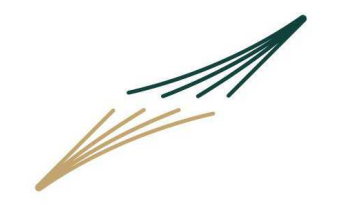


SHEET NOTES:

1. INFORMATION PRESENTED ON DRAWINGS IS BASED ON LIMITED SITE VISIT OBSERVATIONS AND AS-BUILT DRAWINGS. CONTRACTOR SHALL VERIFY ACTUAL CONDITIONS PRIOR TO COMMENCING WORK.

REFERENCE NOTES:

1. REMOVE (E) SURFACE MOUNTED LINEAR LUMINAIRE AND FIXTURE ASSEMBLY MOUNTED TO THE TOP OF BOOK SHELVES. REMOVE BRANCH CIRCUIT CONDUCTORS BACK TO SOURCE AND CAP EXISTING JUNCTION BOXES.



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CONSTRUCTION DRAWINGS
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 CITY OF SPRINGFIELD
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SHEET TITLE:
LIGHTING DEMOLITION PLAN - LIBRARY

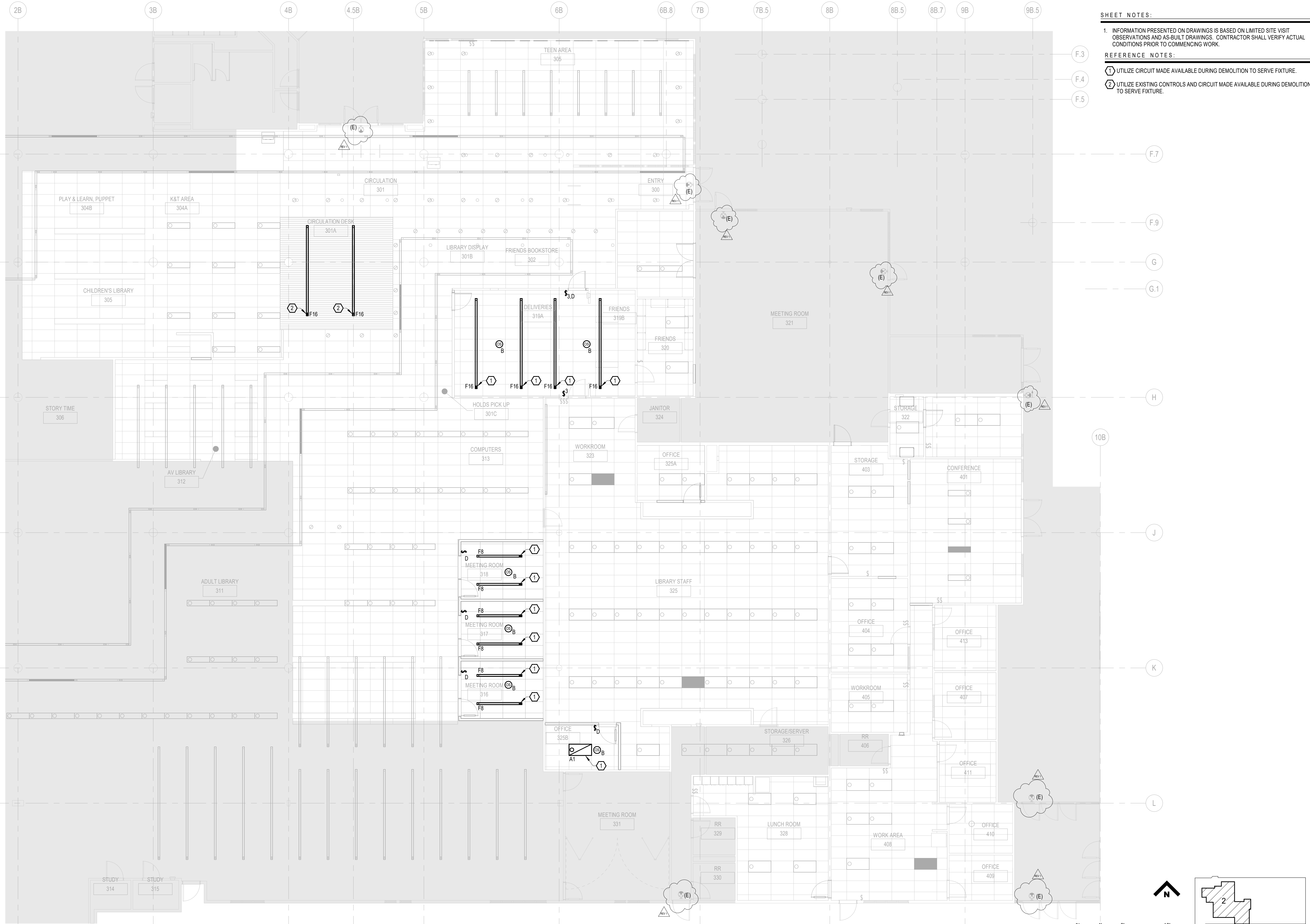
REVISIONS:

#	DESCRP.	DATE

ISSUE DATE: 04.10.2023

E104

1 LIGHTING PLAN - LIBRARY
 1/8" = 1'-0"



SHEET NOTES:

1. INFORMATION PRESENTED ON DRAWINGS IS BASED ON LIMITED SITE VISIT OBSERVATIONS AND AS-BUILT DRAWINGS. CONTRACTOR SHALL VERIFY ACTUAL CONDITIONS PRIOR TO COMMENCING WORK.

REFERENCE NOTES:

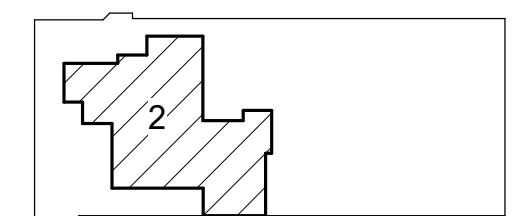
- ① UTILIZE CIRCUIT MADE AVAILABLE DURING DEMOLITION TO SERVE FIXTURE.
- ② UTILIZE EXISTING CONTROLS AND CIRCUIT MADE AVAILABLE DURING DEMOLITION TO SERVE FIXTURE.



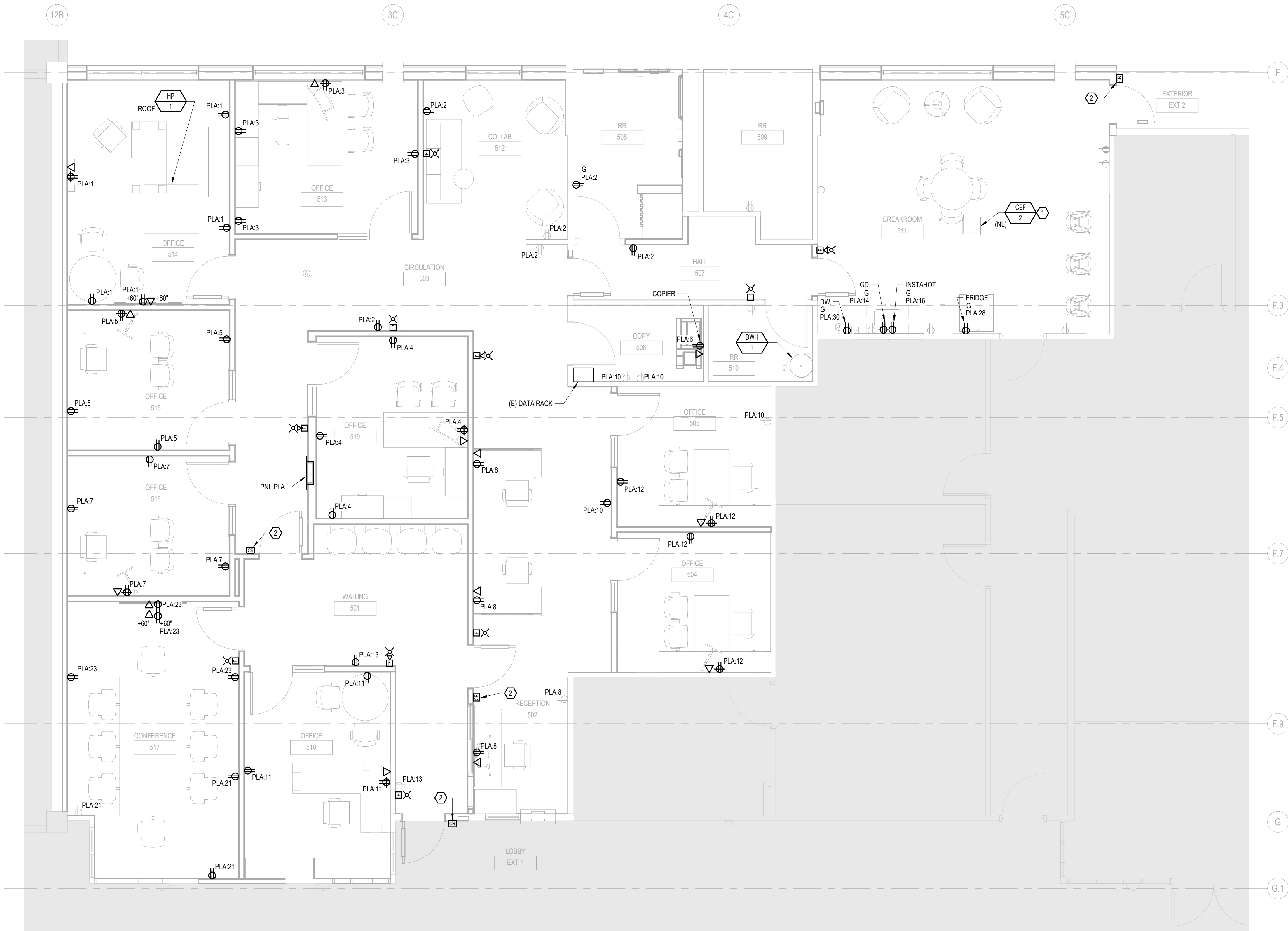
REVISIONS:

#	DESCRP.	DATE
3	REV 1	08/03/2023

1 LIGHTING PLAN - LIBRARY
1/8" = 1'-0"



KEYPLAN



SHEET NOTES:

1. INFORMATION PRESENTED ON DRAWINGS IS BASED ON LIMITED SITE VISIT OBSERVATIONS AND AS-BUILT DRAWINGS. CONTRACTOR SHALL VERIFY ACTUAL CONDITIONS PRIOR TO COMMENCING WORK.
2. ALL DATA DEVICES ON THIS SHEET TO BE CONNECTED BACK TO (E) DATA RACK IDENTIFIED ON PLANS.
3. EXISTING RECEPTACLES THAT SHOW A CIRCUIT DESIGNATION SHALL BE RE-FED FROM CIRCUIT IDENTIFIED.
4. CONNECT NEW FIRE ALARM ANNUNCIATOR DEVICES TO EXISTING FIRE ALARM ANNUNCIATOR CIRCUIT.

REFERENCE NOTES:

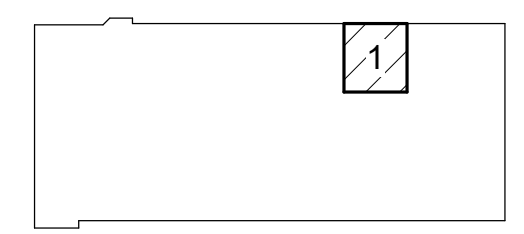
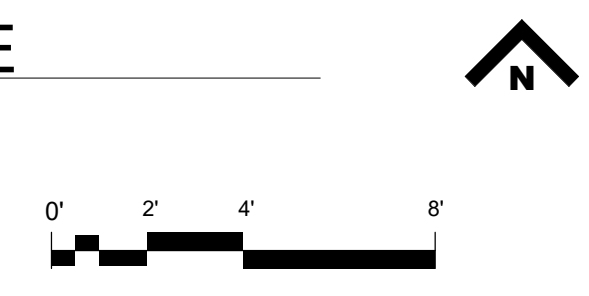
- ① INTERCEPT AND EXTEND EXISTING BRANCH WIRING RETAINED DURING DEMOLITION TO SERVE FAN IN NEW LOCATION.
- ② PROVIDE BACKBOX AND CONDUIT PATHWAY TO ABOVE CEILING SPACE.



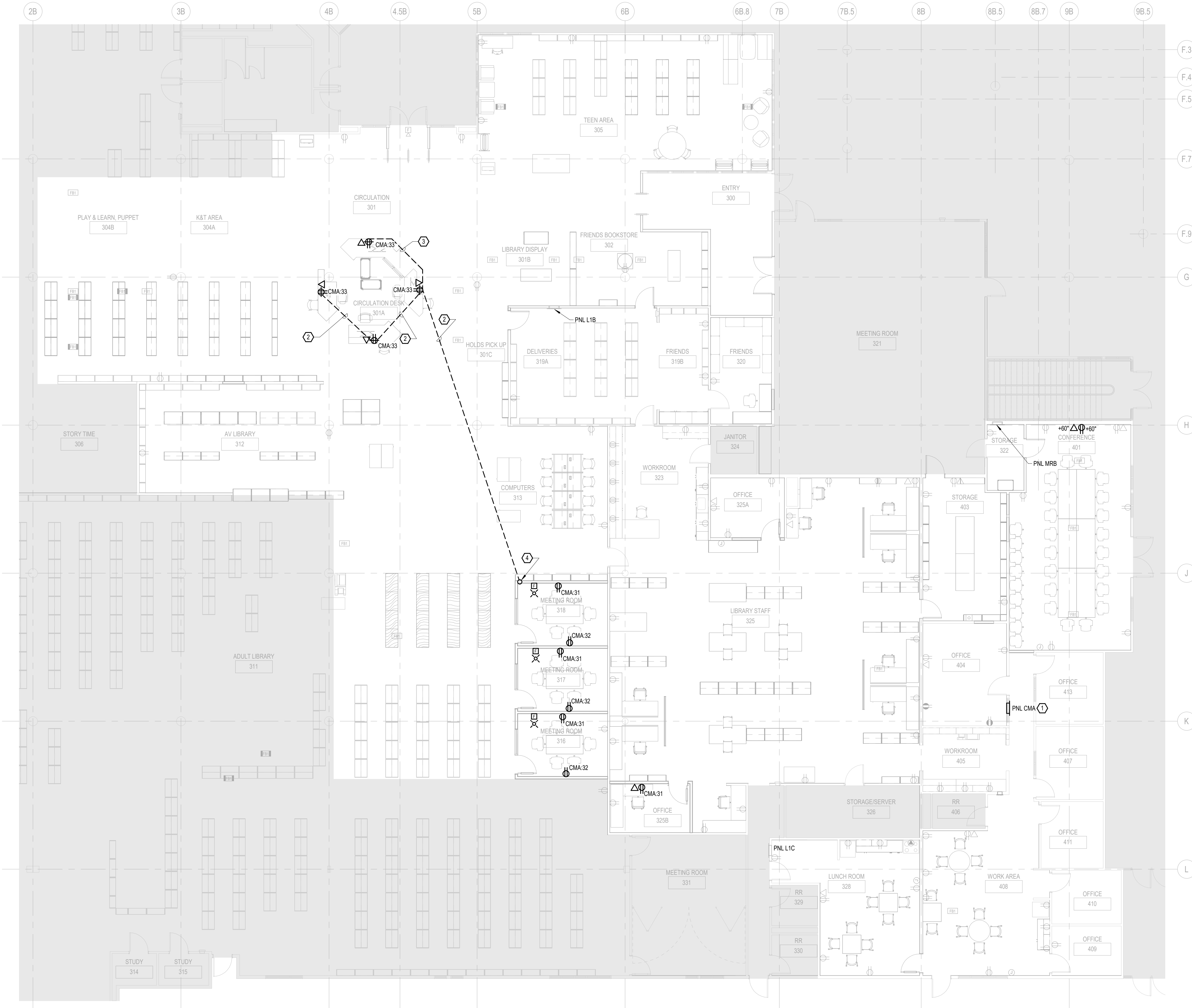
REVISIONS:

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1 FLOOR PLAN - CM OFFICE
1/4" = 1'-0"



KEYPLAN



SHEET NOTES:

1. INFORMATION PRESENTED ON DRAWINGS IS BASED ON LIMITED SITE VISIT OBSERVATIONS AND AS-BUILT DRAWINGS. CONTRACTOR SHALL VERIFY ACTUAL CONDITIONS PRIOR TO COMMENCING WORK.
2. ALL DATA DEVICES ON THIS SHEET TO BE CONNECTED BACK TO (E) DATA RACK IDENTIFIED ON PLANS.
3. CONNECT NEW FIRE ALARM ANNUNCIATOR DEVICES TO EXISTING FIRE ALARM ANNUNCIATOR CIRCUIT.

REFERENCE NOTES:

- ① NEW 42-POLE PANEL 'CMA', REPLACED IN PREVIOUS LOCATION. RECONNECT BRANCH CIRCUITS MAINTAINED THROUGH DEMOLITION.
- ② CONDUIT TO BE ROUTED IN SPACE BELOW BUILDING.
- ③ CONDUIT TO BE ROUTED IN CASEWORK.
- ④ TRANSITION CONDUIT FROM SPACE BELOW BUILDING TO CEILING SPACE AT THIS WALL. CONDUIT FROM WALL TO PANELBOARD TO BE ROUTED IN CEILING SPACE.



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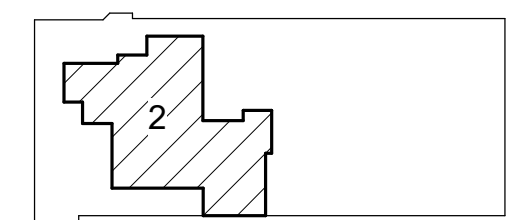
SHEET TITLE:
FLOOR PLAN - LIBRARY

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1 FLOOR PLAN - LIBRARY
1/8" = 1'-0"



KEYPLAN

LUMINAIRE SCHEDULE -

TYPE	DESCRIPTION	BOD MANUFACTURER	LAMP	ADDITIONAL SPECIFICATIONS AND NOTES
A1	2 FT X 4 FT LED LUMINOUS PANEL ASSEMBLY	LITHONIA EPANL SERIES LED LITHONIA 2BLT4 SERIES LED OR APPROVED EQUIVALENT	LIGHT SOURCE: LED COLOR TEMP: 3500K CRI: 80+ OUTPUT: 4000 LM INPUT POWER: 38 W VOLTAGE: 120V	MOUNTING: RECESSED GRID HOUSING: ALUMINUM LENS/REFLECTOR: SATIN WHITE LENS DRIVER: 10% DIMMING DRIVER (0-10VDC) MISC:
A2	1 FT X 4 FT LED LUMINOUS PANEL ASSEMBLY	LITHONIA EPANL SERIES LED LITHONIA BLT4 SERIES LED OR APPROVED EQUIVALENT	LIGHT SOURCE: LED COLOR TEMP: 3500K CRI: 80+ OUTPUT: 3000 LM INPUT POWER: 27 W VOLTAGE: 120V	MOUNTING: RECESSED GRID HOUSING: ALUMINUM LENS/REFLECTOR: SATIN WHITE LENS DRIVER: 10% DIMMING DRIVER (0-10VDC) MISC:
D4	4(DIA) X 6.6. INCH RECESSED LED DOWNLIGHT	GOTHAM EV04SH SERIES OR APPROVED EQUIVALENT	LIGHT SOURCE: LED COLOR TEMP: 3500K CRI: 80+ OUTPUT: 1000LM INPUT POWER: 9W VOLTAGE: 120V	MOUNTING: RECESSED HOUSING: 20G GALV. STEEL LENS/REFLECTOR: MED WIDE DISTRIBUTION, CLEAR, SEMI-SPECULAR DRIVER: 10% DIMMING DRIVER (0-10VDC) MISC: SELF-FLANGED
F(X)	5 IN X 4 IN X (X) FT. DIRECT/INDIRECT PENDANT MOUNTED LED LUMINAIRE	AXIS LIGHTING BEAM6 DIRECT/INDIRECT SERIES OR APPROVED EQUIVALENT	LIGHT SOURCE: LED COLOR TEMP: 3500K CRI: 90+ OUTPUT (UP): 400 LM/FT MIN OUTPUT (DOWN): 400 LM/FT MIN INPUT POWER: 3.1 W/FT VOLTAGE: 120 V	MOUNTING: PENDANT MOUNT HOUSING: EXTRUDED ALUMINUM LENS/REFLECTOR: FLUSH SPOTLESS FROSTED ACRYLIC DRIVER: 1% DIMMING DRIVER (0-10VDC) MISC:
X	12 X 7 X 4 INCH CAST ALUMINUM SURFACE MOUNT EXIT SIGN WITH GREEN LETTERS, UNIVERSAL MOUNTING KIT	LITHONIA LE SERIES OR APPROVED EQUIVALENT	LIGHT SOURCE: LED COLOR TEMP: 3500K CRI: N/A OUTPUT: N/A INPUT POWER: 1W VOLTAGE: UNV	MOUNTING: UNIVERSAL MOUNT HOUSING: CAST ALUMINUM LENS/REFLECTOR: RED DRIVER: N/A MISC:

SCHEDULE GENERAL NOTES:
1. (XX) DESIGNATES LENGTH OF FIXTURE IN FEET AS INDICATED ON THE DRAWING

MECHANICAL EQUIPMENT CONNECTION SCHEDULE

TAG	DESCRIPTION	VOLTAGE	PHASE	HP	KW	FLA	FEEDER DESCRIPTION	CIRCUIT BREAKER (AMPS/POLES)	PANEL IDENTIFICATION	STARTER DIVISION	DISCONNECT DIVISION	VFD DIVISION	NOTES
DWH-1	DOMESTIC WATER HEATER	208	3		1.5	4.2	(3) 12 AWG CU, (1) 12 AWG GND. IN 3/4" C.	15/3	PLA:18,20,22	NA	DIV 26	NA	
HP-1	ROOFTOP HEAT PUMP	208	1		4	19.2	(3) 10 AWG CU, (1) 10 AWG GND. IN 3/4" C.	30/2	PLA:24,26	NA	DIV 26	NA	

OCCUPANCY SENSOR SCHEDULE

TYPE	MODEL	TECHNOLOGY	MOUNTING	POWER PACK
A	nCM PDT 9 RJB	360° PASSIVE INFRARED, MICROPHONIC	CEILING	REQUIRED
B	SENSORSWITCH CM PDT 9 RJB	360° PASSIVE DUAL-TECH	CEILING	REQUIRED

SCHEDULE GENERAL NOTES:
1. REFER TO LIGHTING PLANS FOR OCCUPANCY SENSOR LOCATIONS.
2. BASIS OF DESIGN: ACUTY nLIGHT.

PANEL SCHEDULE

PANEL: PLA
VOLTS: 120/208
LOCATION: CIRCULATION 503
MOUNTING: RECESSED
NOTES:

LOAD CLASS	CONN. VA	DEMAND FACTOR	DEMAND LOAD VA
LIGHTING	1060	125%	1325
RECEPTACLES	16420	*	13210
MOTOR LOADS	4000	**	5000
RESISTANCE LOADS	1500	100%	1500
SUBFEED	0	100%	0
MISC. LOADS	0	100%	0
SUBFEED BREAKER	0		0
TOTAL VOLT-AMPS		CONNECTED	DEMAND
MAXIMUM PHASE AMPS		22,980	21,035
		70.8	65.2

BREAKER A	P	DESCRIPTION	WATTS	CIR. NO.	PHASE	CIR. NO.	WATTS	DESCRIPTION	BREAKER P	A
20	1	RECEPT: OFFICE 514	900	1	A	2	720	RECEPT: COLLAB 512, CIRC 503, HALL 507	1	20
20	1	RECEPT: OFFICE 513	900	3	B	4	900	RECEPT: OFFICE 519	1	20
20	1	RECEPT: OFFICE 515	900	5	C	6	1200	RECEPT: OFFICE 506 COPIER	1	20
20	1	RECEPT: OFFICE 516	900	7	A	8	900	RECEPT: RECEPTION 502	1	20
20	1	LTG: EXIT SIGNS	100	9	B	10	720	RECEPT: OFFICE 504, 505	1	20
20	1	RECEPT: OFFICE 518	900	11	C	12	1080	RECEPT: OFFICE 505, COPY 506, 502	1	20
20	1	RECEPT: WAITING 501	540	13	A	14	1000	RECEPT: BREAK 511 GARBAGE DISP	1	20
20	1	LTG: 501, 513, 514, 515, 516, 517, 518	600	15	B	16	1200	RECEPT: BREAK 511 INSTAHOT	1	20
20	1	SPARE	0	17	C	18	500	DWH-1	3	20
20	1	LTG: OFFICE 504,505, BREAK 511	360	19	A	20	500			
20	1	RECEPT: CONFERENCE 517	540	21	B	22	500			
20	1	RECEPT: CONFERENCE 517	720	23	C	24	2000	HP-1	2	30
20	1	SPARE		25	A	26	2000			
20	1	SPARE		27	B	28	1200	RECEPT: BREAKROOM 511 FRIDGE	1	20
20	1	SPARE		29	C	30	1200	RECEPT: BREAKROOM 511 DISHWASHER	1	20
20	1	SPARE		31	A	32		SPARE	1	20
20	1	SPARE		33	B	34		SPARE	1	20
20	1	SPARE		35	C	36		SPARE	1	20
20	1	SPARE		37	A	38		SPARE	1	20
20	1	SPARE		39	B	40		SPARE	1	20
20	1	SPARE		41	C	42		SPARE	1	20

PHASE TOTALS
CONNECTED VA 7820
DEMAND VA 7440
CONNECTED AMPS 65.2
DEMAND AMPS 62.0

A 7820
B 6660
C 8500
7440
5768
55.5
48.1

* 10KVA AT 100%, REMAINDER AT 50%
** 100% PLUS 25% OF THE LARGEST MOTOR

PANEL SCHEDULE

PANEL: CMA
VOLTS: 120/208
LOCATION: HALL 412
MOUNTING: RECESSED
NOTES: NEW LOADS SHOWN IN BOLD
PROVIDE ALL NEW BREAKERS AS SHOWN

LOAD CLASS	CONN. VA	DEMAND FACTOR	DEMAND LOAD VA
LIGHTING	0	125%	0
RECEPTACLES	2700	*	2700
MOTOR LOADS	0	**	0
RESISTANCE LOADS	0	100%	0
SUBFEED	0	100%	0
MISC. LOADS	0	100%	0
SUBFEED BREAKER	0		0
TOTAL VOLT-AMPS		CONNECTED	DEMAND
MAXIMUM PHASE AMPS		2,700	2,700
		12.0	12.0

BREAKER A	P	DESCRIPTION	WATTS	CIR. NO.	PHASE	CIR. NO.	WATTS	DESCRIPTION	BREAKER P	A
20	1	(E) LOAD		1	A	2		(E) LOAD	1	20
20	1	(E) LOAD		3	B	4		(E) LOAD	1	20
20	1	(E) LOAD		5	A	6		(E) LOAD	1	20
20	1	(E) LOAD		7	B	8		(E) LOAD	1	20
15	1	(E) LOAD		9	A	10		(E) LOAD	1	20
15	1	(E) LOAD		11	B	12		(E) LOAD	1	20
20	2	(E) LOAD		13	A	14		(E) LOAD	1	20
				15	B	16		(E) LOAD	1	20
30	2	(E) LOAD		17	A	18		(E) LOAD	1	20
				19	B	20		(E) LOAD	1	20
20	1	(E) LOAD		21	A	22		(E) LOAD	1	20
20	1	(E) LOAD		23	B	24		(E) LOAD	1	20
20	1	(E) LOAD		25	A	26		(E) LOAD	1	20
20	1	(E) LOAD		27	B	28		(E) LOAD	1	20
20	1	(E) LOAD		29	A	30		(E) LOAD	1	20
20	1	RECEPT: MEETING 316,317,318	720	31	B	32	540	RECEPT: MEETING 316,317,318	1	20
20	1	RECEPT: CIRCULATION DESK 301A	720	33	A	34	720	RECEPT: CIRCULATION DESK 310A	1	20
20	1	SPARE		35	B	36			1	20
20	1	SPARE		37	A	38			1	20
20	1	SPARE		39	B	40			1	20
20	1	SPARE		41	A	42			1	20

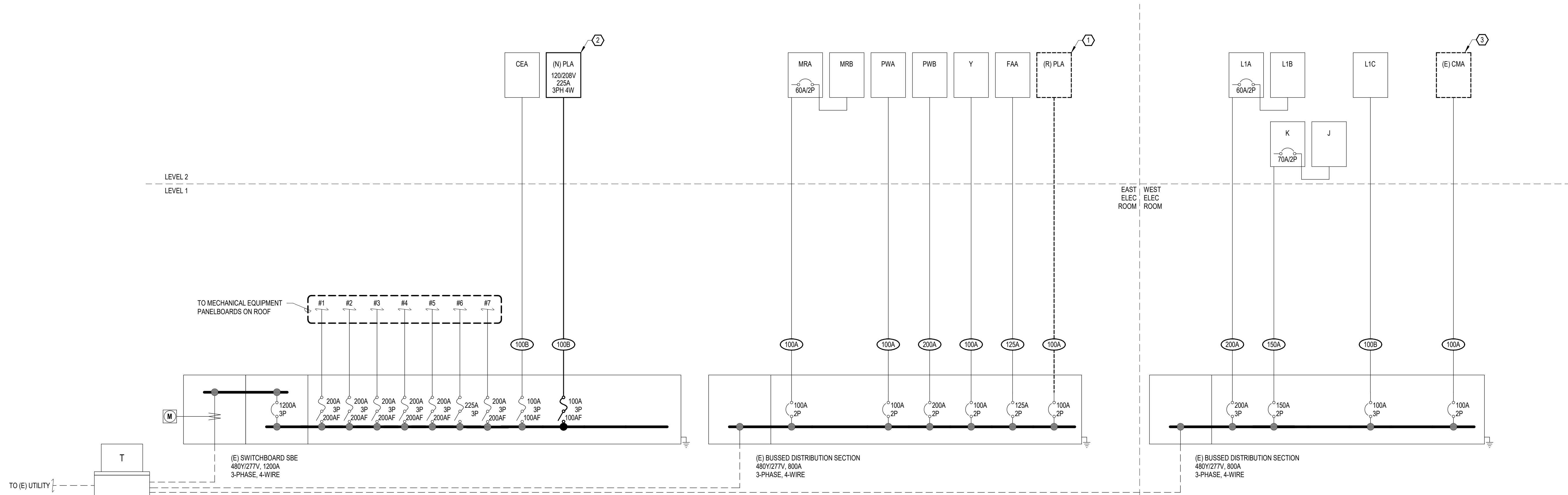
PHASE TOTALS
CONNECTED VA 1440
DEMAND VA 1440
CONNECTED AMPS 12.0
DEMAND AMPS 12.0

A 1440
B 1260
C 1260
10.5
10.5

* 10KVA AT 100%, REMAINDER AT 50%
** 100% PLUS 25% OF THE LARGEST MOTOR



1 ONE-LINE DIAGRAM
NOT TO SCALE



DETAIL GENERAL NOTES:

1. INFORMATION PRESENTED ON DRAWINGS IS BASED ON LIMITED SITE VISIT OBSERVATIONS AND AS-BUILT DRAWINGS. CONTRACTOR SHALL VERIFY ACTUAL CONDITIONS PRIOR TO COMMENCING WORK.

DETAIL REFERENCE NOTES:

- 1 DEMOLISH EXISTING PANELBOARD 'PLA' AND FEEDERS. REFER TO 1/E101.
- 2 PROVIDE NEW 42-CIRCUIT PANELBOARD IN NEW LOCATION. PROVIDE NEW FEEDERS AS INDICATED AND SERVE PANELBOARD FROM EXISTING SPARE BREAKER IN SWITCHBOARD 'SBE'. REFER TO 1/E121 AND PANEL SCHEDULES FOR ADDITIONAL INFORMATION.
- 3 REMOVE PANELBOARD 'CMA'. RETAIN FEEDERS & BRANCH CIRCUITS FOR RECONNECTION TO NEW PANELBOARD. PROVIDE NEW 42-CIRCUIT PANELBOARD IN PREVIOUS LOCATION. REFER TO 1/E122 AND PANEL SCHEDULE FOR ADDITIONAL INFORMATION.



REVISIONS:

#	DESCRP.	DATE