



**City of Tacoma
Tacoma Public Library**

ADDENDUM NO. 2

DATE: September 26, 2023

REVISIONS TO:

**Request for Bids Specification No. LB23-0178F
Main Library Remodel**

NOTICE TO ALL BIDDERS:

This addendum is issued to clarify, revise, add to or delete from, the original specification documents for the above project. This addendum, as integrated with the original specification documents, shall form the specification documents. The noted revisions shall take precedence over previously issued specification documents and shall become part of this contract.

REVISIONS TO THE SUBMITTAL DEADLINE:

The submittal deadline remains the same.

REVISIONS TO THE SPECIFICATIONS:

Substitution Request – Babymedi + Recessed Kit (Baby Changing Station) (attached)
Babymedi + Recessed Kit products as proposed are an approved alternate product as long as the following criteria are met:

- All LEED Criteria and documentation can be met as specified.

Substitution Request – Telecommunication Cabling AMP (attached)
AMP products as proposed are an approved alternate product.

Substitution Request – Mastercraft Electric Inc – Signamax (attached)
Signamax products as proposed are an approved alternate product.

Remove and replace 05 50 00 Metal Fabrications with 05 50 00 Metal Fabrications marked Addendum 2.

Remove and replace 22 40 00 Plumbing Fixtures with 22 40 00 Plumbing Fixtures marked Addendum 2.

Remove and replace 23 36 00 Air Terminal Units with 23 36 00 Air Terminal Units marked Addendum 2.

Remove and replace 25 50 00 Integrated Automation Facility Controls with 25 50 00 Integrated Automation Facility Controls marked Addendum 2.

Remove and replace 25 90 00 Integrated Automation Control Sequence with 25 90 00 Integrated Automation Control Sequence marked Addendum 2.



REVISIONS TO THE PROPOSAL PAGES:

Remove and replace the Bid Proposal page with the Bid Proposal Page marked Addendum 2.

REVISIONS TO THE DRAWINGS:

1. Sheet A421, **REVISE** as shown in the clouded portions of revised sheet, attached.
 - a. Steel sizes and thickness revised and notated.
2. Sheet A431, **REVISE** as shown in the clouded portions of revised sheet, attached.
 - a. Steel sizes and thickness revised and notated.
3. Sheet A513, **REVISE** as shown in the clouded portions of revised sheet, attached.
 - a. Revisions to casework
4. Sheet A514, **REVISE** as shown in the clouded portions of revised sheet, attached.
 - a. Steel sizes and thickness revised and notated.
5. Sheet A604, **REVISE** as shown in the clouded portions of revised sheet, attached.
 - a. Wall coverings notated and revisions to casework.
6. Sheet A605, **REVISE** as shown in the clouded portions of revised sheet, attached.
 - a. Wall coverings notated and revisions to casework.
7. Sheet A801, **REVISE** as show in the clouded portions of revised sheet, attached.
 - a. Removed upper cabinet details where clouded.
8. Sheet A804, **REVISE** as shown in the clouded portions of revised sheet, attached.
 - a. Revisions to casework.
9. Sheet A900, **REVISE** as shown in the clouded portions of revised sheet, attached.
 - a. Revisions to Finish Schedule to show wall coverings.
10. Sheet A910, **REVISE** as shown in the clouded portions of revised sheet, attached.
 - a. Revisions to Door Hardware General Notes
11. Sheet S501, **REVISE** as shown in the clouded portions of revised sheet, attached.
 - a. Stair attachment at glulam notation added.
12. Sheet M001, **REVISE** as shown in the clouded portions of revised sheet, attached.



13. Sheet M003, **REVISE** as shown in the clouded portions of revised sheet, attached.
14. Sheet M004, **REVISE** as shown in the clouded portions of revised sheet, attached.
15. Sheet M101, **REVISE** as shown in the clouded portions of revised sheet, attached.
16. Sheet M102, **REVISE** as shown in the clouded portions of revised sheet, attached.
17. Sheet M104, **REVISE** as shown in the clouded portions of revised sheet, attached.
18. Sheet M304, **REVISE** as shown in the clouded portions of revised sheet, attached.
19. Sheet M402, **REVISE** as shown in the clouded portions of revised sheet, attached.
20. Sheet M404, **REVISE** as shown in the clouded portions of revised sheet, attached.
21. Sheet E0.00, **REVISE** as shown in the clouded portions of revised sheet, attached.
 - a. Electrical Legend: See Revised door controller description.
22. Sheet E1.03, **REVISE** as shown in the clouded portions of revised sheet, attached.
 - a. See revised Add Alt note.
21. Sheet E2.03, **REVISE** as shown in the clouded portions of revised sheet, attached.
 - a. See revised Add Alt note.
22. Sheet E3.01, **REVISE** as shown in the clouded portions of revised sheet, attached.
 - a. Electrical Legend: Remove General Note #7 in its entirety.
23. Sheet E3.02, **REVISE** as shown in the clouded portions of revised sheet, attached.
 - a. Electrical Legend: Remove General Note #7 in its entirety.
24. Sheet E3.03, **REVISE** as shown in the clouded portions of revised sheet, attached.
 - a. Electrical Legend: Remove General Note #7 in its entirety.
25. Sheet E3.04, **REVISE** as shown in the clouded portions of revised sheet, attached.
 - a. Electrical Legend: Remove General Note #7 in its entirety.

QUESTIONS AND ANSWERS:

Question 1: At the second floor stair landing section 2/S501 – how are the glu-lam landing pieces attached to the stair stringer to the left, and existing concrete edge?

A: Refer to revised detail 2/S501 for attachment clarification.



Question 2: Your bid form on Building Connected indicates that there are specifications for integrated doors and sound control doors, however, these sections are not referenced in the project manual. Please advise.

Answer 2: No specific requirements for sound control doors. See revised A910 for clarification.

Question 3: The hardware groups on sheet A910 include products that are not approved in 087100. Do you anticipate a complete hardware schedule to be released including the hardware approved in 087100?

Answer 3: Drawings and specifications describe hardware function and basis of design. Full hardware schedule is responsibility of the contractor to provide during the submittal process. See additional notes on A910 for clarification.

Question 4: Selective Demolition specification 02 41 19/2.1/B refers to hazardous material and asbestos survey(s) included in the Appendix. There does not appear to be an appendix bound in the specifications. Please clarify

Answer 4: The Hazardous Material report has been added with Addendum # 1.

Question 5: The drawings require AISC certifications for structural steel. With this being such a small portion of the project and the requirements of WMBE, this requirement may limit out lists of viable subcontractors.

Answer 5: All bidders are expected to meet all requirements of the bid specification.

Question 6: The WBE, MBE, and SBE requirements listed as firm number each bidder must hit. Are the meant to be listed as project goals?

Answer 6: These are requirements per Tacoma Municipal Code Chapter 1.07.

Question 7: With such a short time line for this project, some of the finishes and material may have a long lead time. Do you anticipate the impact of long lead items in regards to issuing the Notice to Proceed?

Answer 7: Project schedule and submittal schedule identifying long lead time items shall be submitted per the contract documents following Notice to Proceed. Long lead time items shall be submitted by the contractor for review as soon as possible following Notice to Proceed.

Question 8: Description of work to accomplish in the new vestibule is unclear. appears to call for insulation under and existing slab? Please clarify

Answer 8: Slab is not slab on grade. It is above inhabited space and the insulation can be accessed from below.

Question 9: The details for the entry enclosure on sheets A421, A431 and A514 do not include the steel member size and material gage/thickness. This assembly is not called out on structural either. Also, we will need to know what is desired for the "Wire (Steel) Mesh/Perforated Metal" infill panels. Please provide steel sizes and gauge/thicknesses, and panel spec.



Answer 9: See revised sheets A421, A431, and A514 (attached) for steel sizes and thickness. See revised spec section 05 50 00 for infill panel product information.

Question 10: Builders Risk Section 3.9.4 states that the Builders Risk be written in the amount of the Completed value of the structure (versus the Contract Amount). What will the complete value be? Will there be any contents of the building that need to be covered?

Answer 10: Builders Risk Section 3.9.4 has been updated to state that the Builders Risk be written in the amount of contract value. (See Insurance Requirements marked Addendum No 2.)

Question 11: Bid Form - Building Connected. Can you please confirm if there are any Wallcoverings on this project? If yes, can you please point out them on the plans.

Answer 11: Refer to revised Finish Schedule on A900 as well as revised A600 series (attached here in Addendum 2) for wall coverings.

Question 12: Exterior Elevations - A 300. What all is getting painted on exterior? The north elevation at covered entry says existing finishes to remain nothing else is noted.

Answer 12: Exterior paint is a separate contract.

Question 13: Do the railings around carnegie building get paint?

Answer 13: Exterior paint is a separate contract.

Question 14: There are no spec sections for water repellant or anti-graffiti. Can you confirm if there is any scope related to these sections?

Answer 14: Water repellant and anti-graffiti is a separate contract.

Question 15: Exterior railings are not shown on the site plan. Can you tell me where can I find them on plans?

Answer 15: Exterior railings are a separate contract.

Question 16: The bid form is missing the line to write the Tenant Improvements dollar amount.

Answer 16: The line has been added to Bid Proposal page marked Addendum No 2.

Question 17: Substitution Request – Duralife Lockers

Answer 17: Duralife lockers are rejected as they are plastic and do not meet the specification which calls for metal lockers.



NOTE: Acknowledge receipt of this addendum by initialing the corresponding space as indicated on the signature page. Vendors who have already submitted their bid/proposal may contact the Purchasing Division at 253-502-8468 and request return of their bid/proposal for acknowledgment and re-submittal. Or, a letter acknowledging receipt of this addendum may be submitted in an envelope marked Request for Bids Specification No. LB23-0178F Addendum No. 2. The City reserves the right to reject any and all bids, including, in certain circumstances, for failure to appropriately acknowledge this addendum.

cc: Sam Benscoter / Tacoma Public Library



SUBSTITUTION REQUEST

(During the Bidding/Negotiating Stage)

Project: Tacoma Main Library Remodel

Substitution Request Number:

From: Saniflow Corp. / Attn: Samantha Layedra

1102 Tacoma Ave S, Tacoma, WA, 98402-2006

Date: 9/20/2023

To: City of Tacoma

A/E Project Number:

Re: Substitution/ Equal

Contract

Specification Title: TOILET ACCESSORIES

Description: Baby Changing Station

Page: 3

Section: 102800

Paragraph: 2.4B

Proposed Substitution: Babymedi + Recessed Kit

Manufacturer: Saniflow Corp. Address: 3325 NW 70th Ave., Miami FL, 33122 Phone: 305-424-2433

Trade Name: Saniflow, a Mediclinics Company Model No.: CP0016HCS-ASTM + KT0016HCS

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.

Submitted by: Samantha Layedra

Signed by: Samantha Layedra

Firm: Saniflow Corp

Address: 3325 NW 70th Ave, Miami, FL, 33122

Telephone: 305-424-2433 x. 2021






A/E's REVIEW AND ACTION

- ☐ Substitution approved - Make submittal in accordance with Specification Section 01 25 00 Substitution Procedures.
- ☐ Substitution approved as noted - Make submittal in accordance with Specification Section 01 25 00 Substitution Procedures.
- ☐ Substitution rejected - Use specified materials.
- ☐ Substitution Request received too late - Use specified materials.

Signed by:

Date:

Supporting Data Attached: ☐ Drawings ☒ Product Data ☐ Samples ☐ Tests ☒ Reports ☐ _____

| | | | |
|---|--|--|--|
|  | |   |   |
| Comparison | | BabyMedi® | Koala Kare |
| Item No. | | CP0016HCS-ASTM | KB310-SSRE |
| Supporting Data Attached: | Grey injection-molded polypropylene and Stainless Steel exterior | | |
| <input type="checkbox"/> Drawings <input checked="" type="checkbox"/> Product Data <input type="checkbox"/> Samples <input type="checkbox"/> Tests <input checked="" type="checkbox"/> Reports <input type="checkbox"/> _____ | | | |
| Supporting Data Attached: | | | |
| <input type="checkbox"/> Drawings <input checked="" type="checkbox"/> Product Data <input type="checkbox"/> Samples <input type="checkbox"/> Tests <input checked="" type="checkbox"/> Reports <input type="checkbox"/> _____ | | | |
| Supporting Data Attached: | | | |
| <input type="checkbox"/> Drawings <input checked="" type="checkbox"/> Product Data <input type="checkbox"/> Samples <input type="checkbox"/> Tests <input checked="" type="checkbox"/> Reports <input type="checkbox"/> _____ | | | |
| © Copyright 2013, CSI, | Materials | Form Version: January 2013 CSI Form 1.5C Bacteria-resistant Polypropylene Plastic and Stainless Steel exterior | |
| | Antimicrobial | Biocote® additive, based on ion silver technology embedded into surface | Microban additive into the bed surface |
| | Dimensions | 33 7⁄8" W x 18 7⁄8" H Depth while open: 22 1⁄2" Closed: 3 7⁄8" | 41 5⁄16" W x 26 7⁄32" H Depth while open: 17 13⁄32" Closed: 2 23⁄32" |
| | Weight | 35.3 lb | 80 lbs |
| | Finshes | AISI 304 Satin Stainless Steel Cover Finish | Satin finished 304 stainless steel |
| | Liner dispenser capacity | 80 units | 50 units |
| | Maximum support | 220lbs | 200lbs |
| | Price Comparison | \$690 | \$1,249.91 |
| | Features | 2 Bag hooks Nylon safety straps | 1 Bag hook, Nylon safety straps and dual liner cavity |
| | ADA surface mounted | Yes | Yes |
| | Warranty | 5-year limited warranty | 5-year limited warranty |
| | Certifications | ASTM F2285-04, EN 12221-1, EN 12221-2 | ASTM F2285-04(16), ANSI Z535.4, EN 12221:2008+A1: 2013. |
| | Item No. | Recessed Kit- KT0016HCS | |
| | Materials | Wall Box - AISI 304 stainless steel with satin finish Frame - AISI 304 stainless steel with a satin finish | |
| | Dimensions | L:36 1⁄4" x W:4" x H:27 1⁄8" | |
| | Thickness | Wall Box - 0.031" Frame - 0.031" | |
| | Wall Hole Dimensions | L:34 41⁄64" x W:3 57⁄64" x 25 33⁄64" | |

CP0016H-ASTM / CP0016HCS-ASTM / CP0016HCSB-ASTM

General Description

- Surface-mounted baby changing stations made of bacterial-resistant polypropylene and with stainless steel AISI 304 exterior (CP0016HCS-ASTM and CP0016HCSB-ASTM).
- High level of safety and cleanliness.
- Models offer great strength and durability, suitable for high traffic facilities.
- Trendy and stylish design.
- Biocote® antimicrobial additive into its own surface.
- Includes a pair of bag hooks to keep personal belongings close and at hand.
- Fully comply with the American standard ASTM F2285-04 and the European EN 12221-1 and EN 12221-2 standards.

Components & Materials

- **CP0016H:** surface-mounted baby changing station made of polypropylene in white finish.
- **CP0016HCS:** surface-mounted baby changing station made of polypropylene and with a stainless steel AISI 304 exterior, in satin finish.
- **CP0016HCSB:** surface-mounted baby changing station made of polypropylene and with a stainless steel AISI 304 exterior, in black finish.
- **BED:** with approximately 295 in² contoured changing surface area is made of polypropylene in white finish Biocote® antimicrobial additive embedded into its surface, promoting easy cleaning and reducing the growth of odor-causing and staining microbes.
- **LINER DISPENSER:** is made of polypropylene and holds approximately 80 bed liners, minimizing operator refills and discouraging potential vandalism.
- **OPEN/CLOSE MECHANISM:** concealed from the user's view, it consists of a pair of reinforced hinges and a pneumatic cylinder, ensuring high durability and a smooth opening and closing of the baby changing station.
- **MOUNTING CHASSIS:** made of steel with a cathaphoresis treatment. The corresponding mounting hardware is supplied, making the unit installation to the wall easy.
- **FRONTAL CHASSIS:** (CP0016HCS / CP0016HCSB) made of one-piece AISI stainless steel, 1/32" thick, fixed to the bottom of the bed by means of 4 bolts and 4 nuts, always concealed from the user's view, without joints or edges to ensure the user's safety, a better cleaning and a seamless blending with other satin finish accessories in the washroom.

Technical Specifications

| | |
|---|--|
| Dimensions | L: 33 7/8" x W: 3 7/8" (closed) / 22 1/2" (open) x H: 18 7/8" |
| Weight (empty) | 27.12 lb (CP0016H) 35.3 lb (CP0016HCS / CP0016HCSB) |
| Liner dispenser capacity | 80 units |
| Recommended installation height | 31 1/2" at lowest point |
| Recommended installation height (handicapped) | 27 1/2" at lowest point |

Operation

Open the BabyMedi® baby changing station. Place the baby on the centre of the bed and change your baby's diapers. Close the BabyMedi® station.

Under no circumstance should the baby be left unattended at any time on top of the baby changing station in order to avoid injury from falling or slipping.

Please mark the selected item

☐


code

CP0016H-ASTM

material

polypropylene
finish
white


☐


code

CP0016HCS-ASTM

material

polypropylene /
stainless steel
finish
white / satin


☐


code

CP0016HCSB-ASTM

material

polypropylene /
stainless steel
finish
white / black



Installation

According to the installation and safety instructions manual supplied with the unit.

IMPORTANT: in order to ensure BabyMedi is properly installed it is recommended that a qualified person carries out the installation of the unit. The unit must be properly installed on a wall that is able to sustain a considerable weight and can accommodate the supplied installation hardware.

Certificates & Qualifications

Unit shall be ASTM approved, according F2285-04 standard and GS according EN 12221-1 and EN 12221-2 standards.

Ideal location

Public spaces such as, shopping centers, airports, public buildings, childcare centers, etc. Models suitable for high traffic facilities with high strength and durability.

IMPORTANT: the Congress of the United has taken a further step towards gender equality by implementing law 114-235 (10/07/2016). By this law, the American Government states that restrooms, both for men and women, in public buildings all around the country, must have diaper changing facilities in place.

Guide specification

Surface-mounted baby changing stations made of bacterial-resistant polypropylene (CP0016H, CP0016HCS and CP0016HCSB) and with stainless steel AISI 304 exterior (CP0016HCS and CP0016HCSB).

BabyMedi® changing stations offer a very high level of safety and cleanliness being the ideal solution for public spaces such as, shopping centers, airports, public buildings, childcare centers, etc. Models are suitable for high traffic facilities where great strength and durability is needed.

Their trendy and stylish design, allow these baby changing stations to blend into any space perfectly.

Biocote® antimicrobial additive, based on ion silver technology, is embedded into the surface, promoting an easy cleaning and reducing the growth of odor causing and staining microbes.

BabyMedi® baby changing stations are supplied with child protection straps made of nylon assembled.

A pair of bag hooks (one at the right side and the other one at the left) help to keep personal belongings close and at hand.

BabyMedi® units fully compliant with the American standard ASTM F2285-04 and the European EN 12221-1 and EN 12221-2 standards that require baby changing stations be able to support a 110 lb static load test during one hour. Moreover, units tested in our own laboratories have withstood loads over 220 lb.

Overall dimensions:

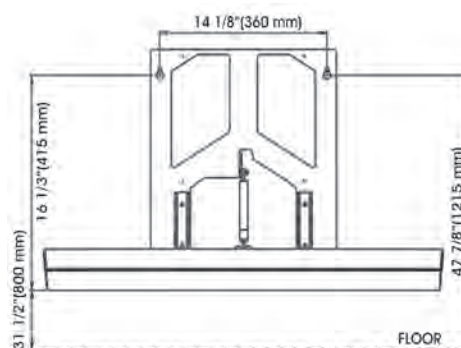
L:33 7/8" x W:3 7/8" (closed)/ 22 1/2" (open) x H:18 7/8"

Weight: 27.12 Lbs. (CP0016H) / 35.3 Lbs. (CP0016HCS and CP0016HCSB)

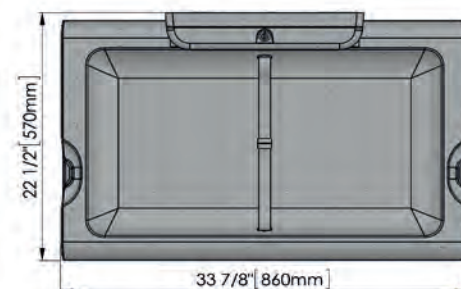
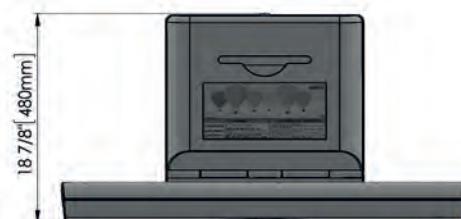
Recommended heights from floor

| | Male | Female | Disabled |
|-------------------------------|------------------|------------------|--------------------|
| x To bottom of unit | 31 1/2" (800 mm) | 31 1/2" (800 mm) | 27 1/2" (700 mm) |
| y To mounting brackets | 16 3/8" (415 mm) | 16 3/8" (415 mm) | 12 13/32" (315 mm) |

MOUNTING



CP0016H-ASTM / CP0016HCS-ASTM /
CP0016HCSB-ASTM



Job:

Model number:

Variations:

Architect / Engineer:

Contractor:

Customer / Wholesaler:

City / State / Country:

Date:

Quantity:

Saniflow Corp reserves the right to make changes and/or modifications to the products and their specifications without warning or notice.

For further info please contact SANIFLOW on: Toll free: **1-877-222-9125** or visit our website at **www.saniflowcorp.com**

Tel: +1 (305) 424 2433 Fax: +1 (305) 424 2435 · **sales@saniflowcorp.com**

KT0016HCS / KT0016HCSB

General Description

- Kit to recess the BabyMedi horizontal baby changing station to the wall.
- This kit to recess the BabyMedi horizontal baby changing station allows the changing table to be completely flush with the wall once it is closed, not taking up unnecessary space and thus allowing the creation of more open spaces free of obstacles.
- Possibility of combining finishes between the kit for recess and the baby changing station.
- Maximum robustness and vandal-proof design.
- Excellent integration and aesthetic level

Components & Materials

- KT0016HCS: kit for recessing into the wall the BabyMedi horizontal baby changing stations CP0016HCS or CP0016HCSB by Mediclinics. Made of AISI 304 stainless steel with a satin finish.
- KT0016HCSB: kit for recessing into the wall the BabyMedi horizontal baby changing stations CP0016HCS or CP0016HCSB by Mediclinics. Made of AISI 304 stainless steel with a matte black finish.
- WALL BOX: 0.031" thick, made of AISI 304 stainless steel with satin finish (KT0016HCS) or matt black finish (KT0016HCSB), with 4 Ø 0.3" side holes to fix the changing table to the hole in the wall.
- FRAME: integrated into the same wall box, 0.031" thick, made of AISI 304 stainless steel with a satin finish (KT0016HCS) or a matte black finish (KT0016HCSB).
- SCREWS: for wall mounting are not included. It is recommended the use of stainless steel screws and specific for the type of wall where the installation will be made.

Technical Specifications

| | |
|----------------------|--------------------------------------|
| Dimensions | L:36 1/4" x W:4" x H:27 1/8" |
| Wall hole dimensions | L:34 41/64" x W:3 57/64" x 25 33/64" |
| Wall box thickness | 0.031" |
| Frame thickness | 0.031" |
| Net weight | 14 Lbs. |

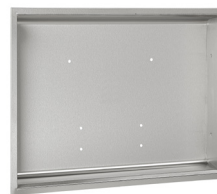
Mounting

Fix the kit with the most suitable screws for the type of wall, through the holes on the side of the mounting chassis, to the wall, at the points indicated with an "S" in the following figure and always following, step by step, the mounting instructions you will find in the "Installation and Assembly Manual" provided with the unit.

When installing the recessed kit, keep in mind that the bottom of the changing table must be at a height of approximately 31 1/2" from the ground.

Warning: Before installation please refer to the supplied installation manual as to ensure the unit will function properly and safely, it must be installed in accordance with these instructions.

Please mark the selected item



code

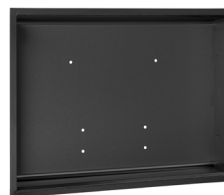
KT0016HCS

material

AISI 304 stainless steel

finish

satin



code

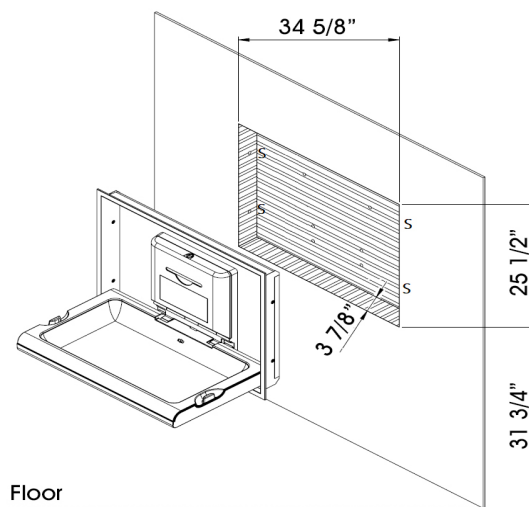
KT0016HCSB

material

AISI 304 stainless steel

finish

matte black



Installation

According to the installation and safety instructions manual supplied with the unit.

IMPORTANT: in order to ensure recessed BabyMedi is properly installed it is recommended that a qualified person carries out the installation of the unit. The unit must be properly installed on a wall that is able to sustain a considerable weight and can accommodate the supplied installation hardware.

Ideal location

Public spaces such as, shopping centers, airports, public buildings, childcare centers, etc. Models suitable for high traffic facilities with high strength and durability.

IMPORTANT: the Congress of the United States has taken a further step towards gender equality by implementing law 114-235 (10/07/2016). By this law, the American Government states that restrooms, both for men and women, in public buildings all around the country, must have diaper changing facilities in place.

Guide specification

Kit to recess the BabyMedi horizontal baby changing station to the wall. This kit to recess the BabyMedi horizontal baby changing station allows the changing table to be completely flush with the wall once it is closed, not taking up unnecessary space and thus allowing the creation of more open spaces free of obstacles.

Possibility of combining finishes between the kit for recess and the baby changing station.

Maximum robustness and vandal-proof design.

Excellent integration and aesthetic level

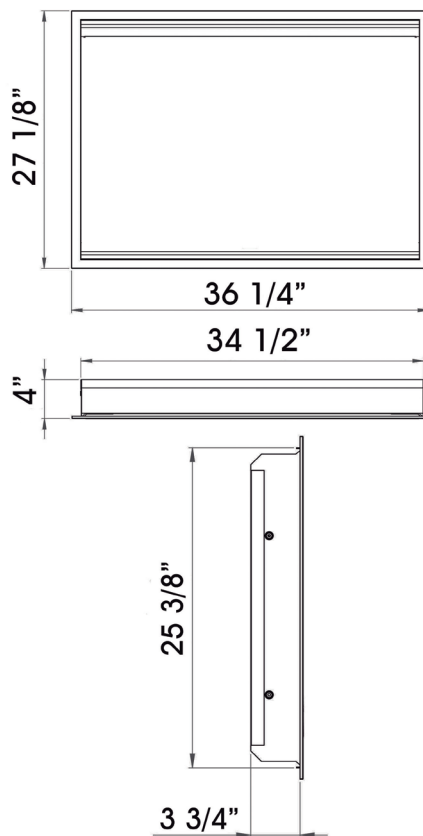
Overall dimensions:

L: 36 1/4" x W: 4" x H: 27 1/4"

Net weight: 14 Lbs.

DIMENSIONS

KT0016HCS / KT0016HCSB



Job:

Model number:

Variations:

Architect / Engineer:

Contractor:

Customer / Wholesaler:

City / State / Country:

Date:

Quantity:

Saniflow Corp reserves the right to make changes and/or modifications to the products and their specifications without warning or notice.

For further info please contact SANIFLOW on: Toll free: 1-877-222-9125 or visit our website at www.saniflowcorp.com

Tel: +1 (305) 424 2433 Fax: +1 (305) 424 2435 · sales@saniflowcorp.com



CSI Form 1.5C**SUBSTITUTION
REQUEST
(During the Bid Period)**

Project: Tacoma Public Library
Main Library Remodel
To: BuildingWork
Cross Engineers
Re: _____

Substitution Request Number: _____
From: South Sound Systems, LLC.
Date: 9/21/23
A/E Project Number: _____
Contract For: _____

Specification Title: Telecommunication Cabling
Section: 271000 Page: 6- all materials
Description: Manufacture- AMP
Article/Paragraph: 2.3 & Section 2

Proposed Substitution: Ortronics/ Superior Esses
Manufacturer: Ortronics Address: 809 W Main St. Monroe, WA Phone: 360-794-6364
Trade Name: nCompass Model No.: All telecom materials

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.

Submitted by: Wes Hillman, RCDD
Signed by: Wes Hillman
Firm: South Sound Systems
Address: PO Box 5758
Lacey, WA 98509
Telephone: 360-515-5151

A/E's REVIEW AND ACTION

- ☐ Substitution approved - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.
☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.
☐ Substitution rejected - Use specified materials.
☐ Substitution Request received too late - Use specified materials.

Signed by: _____

Date: _____

Supporting Data Attached: ☐ Drawings ☐ Product Data ☐ Samples ☐ Tests ☐ Reports ☐ _____

April 17, 2013

Test Report Number: 3030592CRT-098

Project Number: 3030592



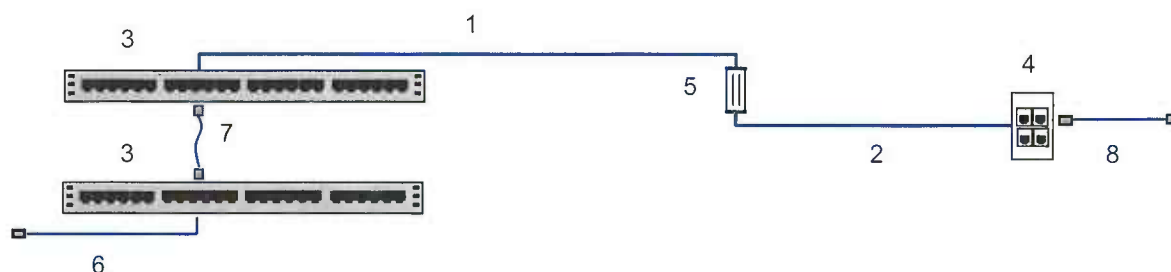
Legrand North America
125 Eugene O'Neill Drive
New London, CT 06320
Ph (860) 445-3800
Fax (860) 405-2970

TEST:

Electrical transmission performance testing of a cabling configuration to the requirements of ANSI/TIA-568-C.2 Balanced Twisted-Pair Telecommunication Cabling and Component Standards for Category 6 Channel.

SAMPLE DESCRIPTION:

The client supplied and tested a 4-Connector channel as illustrated below and referenced to as "nCompass CAT 6+ U/UTP Channel, 4-Connector, 100 meters (328 ft)".



| Component ID | Manufacturer | Part Number | Length/Qty | Description |
|--------------|-----------------|---------------|-----------------|--------------------------------|
| 1 | Superior Essex | 66-272-xB | 70m (229 ft) /1 | DataGain Cable, C6+ U/UTP CMP |
| 2 | Superior Essex | 66-272-xB | 20m (65 ft) /1 | DataGain Cable, C6+ U/UTP CMP |
| 3 | Ortronics, Inc. | OR-PHD66U24 | 2 | Clarity C6 24 Port Patch Panel |
| 4 | Ortronics, Inc. | OR-HDJ6 | 1 | Clarity C6 High Density Jack |
| 5 | Ortronics, Inc. | OR-110ABC6050 | 1 | Clarity C6 IDC 110 Block kit |
| 6,7,8 | Ortronics, Inc. | OR-MC609-06 | 3m (9.8 ft) /3 | Clarity C6 U/UTP Patch Cords |

STANDARD USED:

ANSI/TIA-568-C.2-2009: Balanced Twisted-Pair Telecommunications Cabling and Components Standard, dated August 2009

Note: U/UTP is a newer designation for LAN UTP cable construction.

Page 1 of 2

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Ortronics

Test report number 3030592CRT-098
April 17, 2013

SECTIONS:

6.2: Channel transmission performance (6.2.1 to 6.2.26)

AUTHORIZATION:

The project was authorized by Mr. Rob Aekins RCDD, Legrand Data Communications Incorporated.

EQUIPMENT LIST:

The following equipment was employed in conducting the tests.

| <u>Equipment used</u> | <u>Model number</u> | <u>Serial number</u> | <u>Calibration date</u> | <u>Calibration due date</u> |
|---------------------------------------|-------------------------|--------------------------|-----------------------------|---------------------------------|
| Agilent Technologies Network Analyzer | E5071B | MY42403324 | 06/01/2012 | 06/01/2013 |
| Hewlett Packard Multimeter | 34401A | US36035667 | 06/01/2012 | 06/01/2013 |

DATE OF TEST:

April 3, 2013

TEST REPORT REVISION HISTORY:

First Issue: April 17, 2013 Original Document

RESULTS: See appendixes A through C for the test results.

CONCLUSION:

The channel cabling configuration, as previously described and supplied by the client, was tested in accordance with the standard referred to herein, and did comply with the indicated applicable transmission requirements.

The procedures and requirements from the standard were followed, and the testing was performed at the client's facility as part of their qualifications under Intertek's SAT program.

Reviewed and Approved By:

Antoine Pelletier
Engineer
Global Cabling Products Testing

John Cash
Technician
Global Cabling Products Testing



Ortronics

Test report number 3030592CRT-098
April 17, 2013

Appendix A

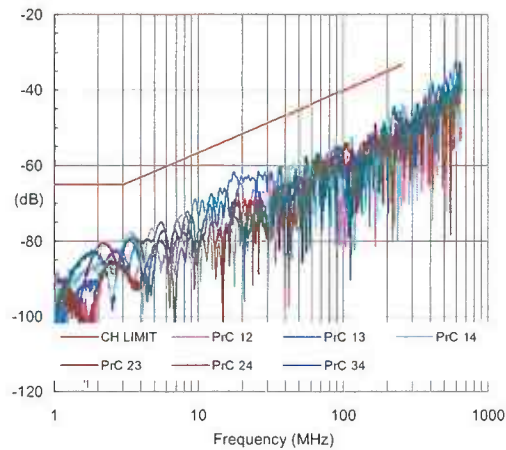
Test results

Internal (core) transmission characteristics

This appendix contains 5 pages.



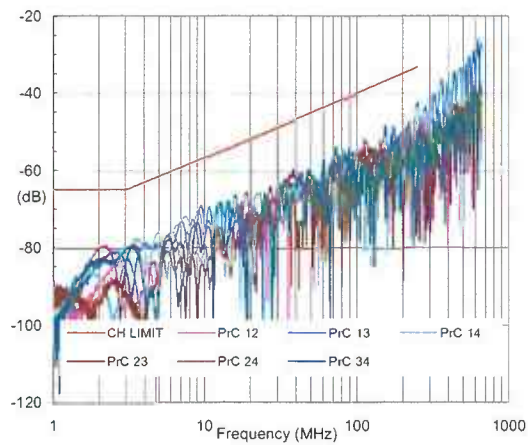
NEXT as measured from the TELECOMMUNICATIONS ROOM (TR)



Worst Case Margin

| | Frequency Calculated | Measured | CH LIMIT |
|----------|----------------------|----------|----------|
| | Point | Margin | Value |
| | (MHz) | (dB) | Value |
| | (dB) | (dB) | (dB) |
| Swept | 52.6 | 9.2 | 61.8 |
| Freq | | | 52.6 |
| Discrete | | | |
| Points | 1.00 | 24.0 | 89.0 |
| | 4.00 | 17.8 | 80.9 |
| | 8.00 | 15.6 | 73.7 |
| | 10.00 | 16.4 | 72.9 |
| | 16.00 | 13.3 | 66.5 |
| | 20.00 | 11.3 | 62.9 |
| | 25.00 | 15.3 | 65.3 |
| | 31.25 | 15.2 | 63.6 |
| | 62.50 | 17.7 | 61.1 |
| | 100.00 | 16.3 | 56.2 |
| | 200.00 | 17.5 | 52.2 |
| | 250.00 | 12.3 | 45.4 |
| | 300.00 | | 46.4 |
| | 400.00 | | 38.1 |
| | 500.00 | | 38.4 |
| | 650.00 | | 35.3 |

NEXT as measured from the WORK AREA (WA)

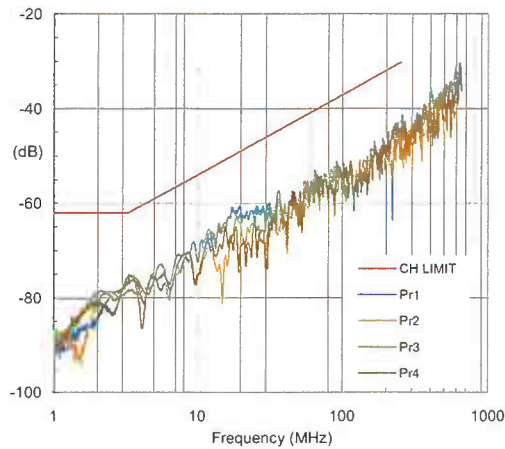


Worst Case Margin

| | Frequency Calculated | Measured | CH LIMIT |
|----------|----------------------|----------|----------|
| | Point | Margin | Value |
| | (MHz) | (dB) | Value |
| | (dB) | (dB) | (dB) |
| Swept | 248.2 | 9.1 | 42.2 |
| Freq | | | 33.2 |
| Discrete | | | |
| Points | 1.00 | 24.7 | 89.7 |
| | 4.00 | 15.9 | 78.9 |
| | 8.00 | 17.0 | 75.1 |
| | 10.00 | 18.1 | 74.7 |
| | 16.00 | 13.6 | 66.8 |
| | 20.00 | 17.0 | 68.7 |
| | 25.00 | 15.6 | 65.6 |
| | 31.25 | 15.2 | 63.6 |
| | 62.50 | 16.9 | 60.3 |
| | 100.00 | 14.4 | 54.3 |
| | 200.00 | 15.5 | 50.3 |
| | 250.00 | 9.1 | 42.2 |
| | 300.00 | | 50.1 |
| | 400.00 | | 36.2 |
| | 500.00 | | 33.8 |
| | 650.00 | | 27.2 |



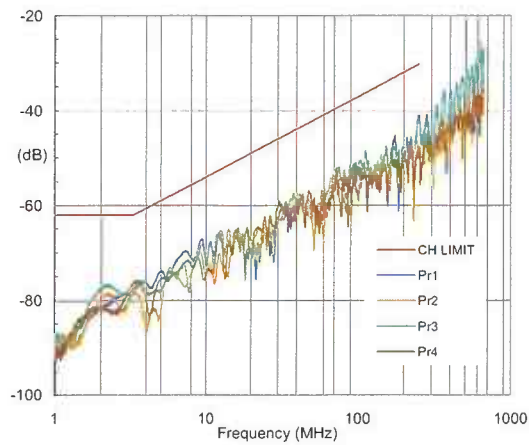
PSNEXT as measured from the TELECOMMUNICATIONS ROOM (TR)



Worst Case Margin

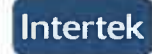
| | Frequency | Calculated | Calculated | CH LIMIT |
|----------|-----------|------------|------------|----------|
| | Point | Margin | Value | Value |
| | (MHz) | (dB) | (dB) | (dB) |
| Swept | 17.6 | 10.9 | 60.8 | 49.9 |
| Freq | | | | |
| Discrete | 1.00 | 25.4 | 87.4 | 62.0 |
| Points | 4.00 | 17.1 | 77.6 | 60.5 |
| | 8.00 | 15.2 | 70.8 | 55.6 |
| | 10.00 | 18.2 | 72.2 | 54.0 |
| | 16.00 | 13.3 | 63.9 | 50.6 |
| | 20.00 | 11.8 | 60.7 | 49.0 |
| | 25.00 | 14.5 | 61.9 | 47.3 |
| | 31.25 | 14.9 | 60.7 | 45.7 |
| | 62.50 | 16.3 | 56.9 | 40.6 |
| | 100.00 | 16.5 | 53.6 | 37.1 |
| | 200.00 | 17.0 | 48.8 | 31.9 |
| | 250.00 | 13.2 | 43.4 | 30.2 |
| | 300.00 | | 44.1 | n/a |
| | 400.00 | | 36.3 | n/a |
| | 500.00 | | 35.7 | n/a |
| | 650.00 | | 32.8 | n/a |

PSNEXT as measured from the WORK AREA (WA)

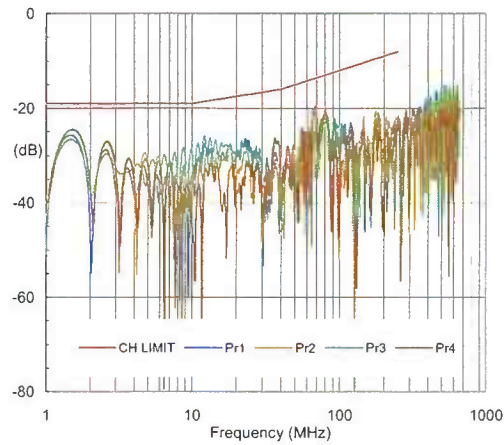


Worst Case Margin

| | Frequency | Calculated | Calculated | CH LIMIT |
|----------|-----------|------------|------------|----------|
| | Point | Margin | Value | Value |
| | (MHz) | (dB) | (dB) | (dB) |
| Swept | 247.0 | 10.8 | 41.0 | 30.3 |
| Freq | | | | |
| Discrete | 1.00 | 25.0 | 87.0 | 62.0 |
| Points | 4.00 | 15.9 | 76.4 | 60.5 |
| | 8.00 | 15.8 | 71.4 | 55.6 |
| | 10.00 | 17.9 | 71.9 | 54.0 |
| | 16.00 | 14.5 | 65.1 | 50.6 |
| | 20.00 | 18.1 | 67.1 | 49.0 |
| | 25.00 | 16.1 | 63.5 | 47.3 |
| | 31.25 | 14.6 | 60.3 | 45.7 |
| | 62.50 | 16.9 | 57.5 | 40.6 |
| | 100.00 | 14.5 | 51.6 | 37.1 |
| | 200.00 | 16.2 | 48.1 | 31.9 |
| | 250.00 | 11.0 | 41.2 | 30.2 |
| | 300.00 | | 47.3 | n/a |
| | 400.00 | | 35.7 | n/a |
| | 500.00 | | 33.4 | n/a |
| | 650.00 | | 26.8 | n/a |



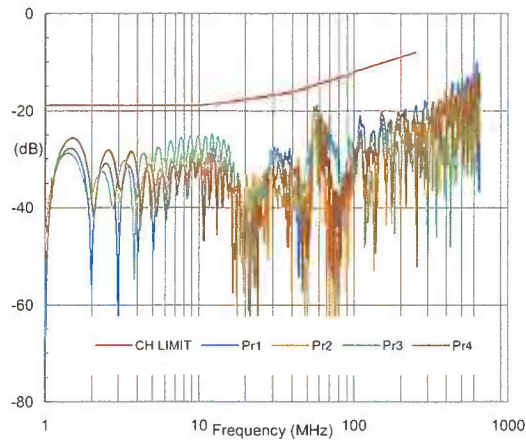
RL as measured from the TELECOMMUNICATIONS ROOM (TR)



Worst Case Margin

| | Frequency Point (MHz) | Calculated Margin (dB) | Measured Value (dB) | CH LIMIT Value (dB) |
|----------|-----------------------|------------------------|---------------------|---------------------|
| Swept | 1.5 | 5.5 | 24.5 | 19.0 |
| Freq | | | | |
| Discrete | 1.00 | 20.9 | 39.9 | 19.0 |
| Points | 4.00 | 13.4 | 32.4 | 19.0 |
| | 8.00 | 13.3 | 32.3 | 19.0 |
| | 10.00 | 10.4 | 29.4 | 19.0 |
| | 16.00 | 9.6 | 27.6 | 18.0 |
| | 20.00 | 12.4 | 29.9 | 17.5 |
| | 25.00 | 11.3 | 28.3 | 17.0 |
| | 31.25 | 17.9 | 34.4 | 16.5 |
| | 62.50 | 10.9 | 24.9 | 14.0 |
| | 100.00 | 19.7 | 31.7 | 12.0 |
| | 200.00 | 16.7 | 25.7 | 9.0 |
| | 250.00 | 14.3 | 22.3 | 8.0 |
| | 300.00 | | 24.6 | n/a |
| | 400.00 | | 23.5 | n/a |
| | 500.00 | | 17.7 | n/a |
| | 650.00 | | 21.9 | n/a |

RL as measured from the WORK AREA (WA)

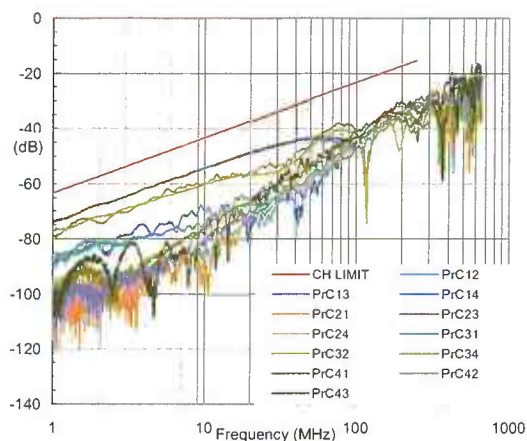


Worst Case Margin

| | Frequency Point (MHz) | Calculated Margin (dB) | Measured Value (dB) | CH LIMIT Value (dB) |
|----------|-----------------------|------------------------|---------------------|---------------------|
| Swept | 57.6 | 4.4 | 18.8 | 14.4 |
| Freq | | | | |
| Discrete | 1.00 | 22.6 | 41.6 | 19.0 |
| Points | 4.00 | 14.4 | 33.4 | 19.0 |
| | 8.00 | 9.4 | 28.4 | 19.0 |
| | 10.00 | 6.8 | 25.8 | 19.0 |
| | 16.00 | 13.8 | 31.8 | 18.0 |
| | 20.00 | 17.2 | 34.7 | 17.5 |
| | 25.00 | 17.9 | 35.0 | 17.0 |
| | 31.25 | 12.5 | 29.0 | 16.5 |
| | 62.50 | 10.2 | 24.3 | 14.0 |
| | 100.00 | 17.8 | 29.8 | 12.0 |
| | 200.00 | 12.8 | 21.8 | 9.0 |
| | 250.00 | 11.1 | 19.2 | 8.0 |
| | 300.00 | | 20.0 | n/a |
| | 400.00 | | 17.2 | n/a |
| | 500.00 | | 14.3 | n/a |
| | 650.00 | | 16.0 | n/a |



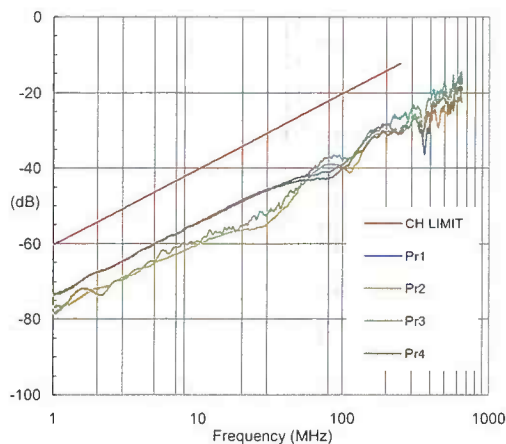
ACRF



Worst Case Margin

| | Frequency Calculated | | Measured | CH LIMIT |
|----------|----------------------|-------------|------------|------------|
| | Point (MHz) | Margin (dB) | Value (dB) | Value (dB) |
| Swept | 1.7 | 9.9 | 68.4 | 58.5 |
| Freq | | | | |
| Discrete | | | | |
| Points | 1.00 | 10.2 | 73.4 | 63.3 |
| | 4.00 | 10.5 | 61.7 | 51.2 |
| | 8.00 | 10.8 | 56.0 | 45.2 |
| | 10.00 | 11.0 | 54.3 | 43.3 |
| | 16.00 | 11.1 | 50.3 | 39.2 |
| | 20.00 | 11.3 | 48.5 | 37.2 |
| | 25.00 | 11.5 | 46.8 | 35.3 |
| | 31.25 | 12.2 | 45.6 | 33.4 |
| | 62.50 | 13.6 | 40.9 | 27.3 |
| | 100.00 | 18.7 | 42.0 | 23.3 |
| | 200.00 | 13.3 | 30.5 | 17.2 |
| | 250.00 | 14.1 | 29.4 | 15.3 |
| | 300.00 | | 26.4 | n/a |
| | 400.00 | | 22.9 | n/a |
| | 500.00 | | 20.3 | n/a |
| | 650.00 | | 19.7 | n/a |

PSACRF

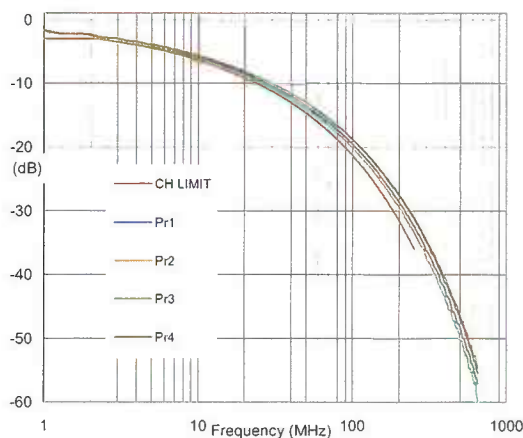


Worst Case Margin

| | Frequency Calculated | | Calculated | CH LIMIT |
|----------|----------------------|-------------|------------|------------|
| | Point (MHz) | Margin (dB) | Value (dB) | Value (dB) |
| Swept | 227.3 | 12.7 | 25.8 | 13.1 |
| Freq | | | | |
| Discrete | | | | |
| Points | 1.00 | 13.0 | 73.2 | 60.3 |
| | 4.00 | 13.4 | 61.7 | 48.2 |
| | 8.00 | 13.8 | 56.0 | 42.2 |
| | 10.00 | 14.0 | 54.3 | 40.3 |
| | 16.00 | 14.0 | 50.2 | 36.2 |
| | 20.00 | 14.2 | 48.4 | 34.2 |
| | 25.00 | 14.5 | 46.8 | 32.3 |
| | 31.25 | 15.1 | 45.4 | 30.4 |
| | 62.50 | 15.6 | 40.0 | 24.3 |
| | 100.00 | 17.9 | 38.1 | 20.3 |
| | 200.00 | 14.2 | 28.4 | 14.2 |
| | 250.00 | 14.4 | 26.7 | 12.3 |
| | 300.00 | | 24.0 | n/a |
| | 400.00 | | 21.5 | n/a |
| | 500.00 | | 18.2 | n/a |
| | 650.00 | | 17.7 | n/a |



INSERTION LOSS (ATTN)



Worst Case Margin

| | Frequency | Calculated | Measured | CH LIMIT |
|----------|-----------|------------|----------|----------|
| | Point | Margin | Value | Value |
| | (MHz) | (dB) | (dB) | (dB) |
| Swept | | | | |
| Freq | 2.28 | 0.19 | 2.89 | 3.08 |
| Discrete | | | | |
| Points | 1.00 | 1.16 | 1.8 | 3.0 |
| | 4.00 | 0.32 | 3.7 | 4.0 |
| | 8.00 | 0.29 | 5.4 | 5.7 |
| | 10.00 | 0.26 | 6.1 | 6.3 |
| | 16.00 | 0.36 | 7.7 | 8.0 |
| | 20.00 | 0.39 | 8.6 | 9.0 |
| | 25.00 | 0.40 | 9.7 | 10.1 |
| | 31.25 | 0.50 | 10.9 | 11.4 |
| | 62.50 | 0.88 | 15.6 | 16.5 |
| | 100.00 | 1.24 | 20.1 | 21.3 |
| | 200.00 | 2.15 | 29.4 | 31.5 |
| | 250.00 | 2.60 | 33.4 | 36.0 |
| | 300.00 | | 37.3 | n/a |
| | 400.00 | | 43.9 | n/a |
| | 500.00 | | 50.3 | n/a |
| | 650.00 | | 59.7 | n/a |

GLOSSARY of TERMS

| | |
|-----------------------------|--|
| Calculated Margin: | The minimum difference in dB between the measured value and the LIMIT value at the specified frequency point for all tested pairs ($\text{CalculateMargin@100MHz} = \text{MeasuredValue@100MHz} - \text{LIMITValue@100MHz (dB)}$). |
| Discrete Points: | Specific reference points of interest in MHz within the swept frequencies. |
| Frequency Point: | A specific frequency point in megahertz (MHz) for which the data indicated is applicable. |
| LIMIT Value: | The calculated response LIMIT in dB at the indicated frequency point as calculated using applicable equations defined by the appropriate standard. |
| Measured Value: | The worst case measured response in dB at the frequency indicated for all tested pairs. |
| Swept Freq: | The band of measured values from 1 MHz to the upper frequency LIMIT as defined by the category of test. |
| Swept Freq (Margin): | The minimum margin in dB detected across the Swept Frequency band. |
| Worst Case: | A composite value calculated from the maximum response of each pair or pair combination at a given frequency. ($\text{WorstCase}_{100\text{MHz}} = \text{Max}(\text{Pr1}_{100\text{MHz}}, \text{Pr2}_{100\text{MHz}}, \text{Pr3}_{100\text{MHz}}, \text{Pr4}_{100\text{MHz}})$ etc. |
| ACR / PSACR: | If Provided are for reference only. Limit line(s) are provided for reference and are calculated as the difference between the applicable NEXT Loss and Insertion loss limits ($\text{ACR}_{\text{limit}} = \text{NEXT}_{\text{limit}} - \text{I}_{\text{limit}}$). |



Ortronics

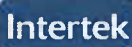
Test report number 3030592CRT-098
April 17, 2013

Appendix B

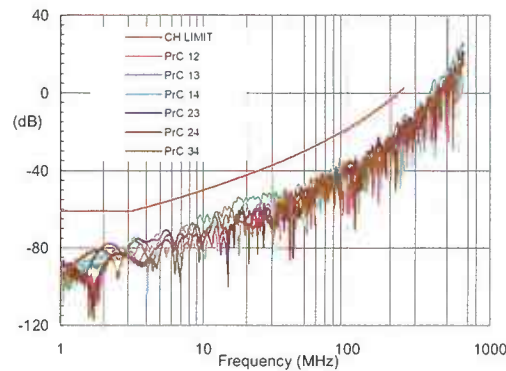
Test results

ACR transmission performance provided for reference ONLY

This appendix contains 2 pages.



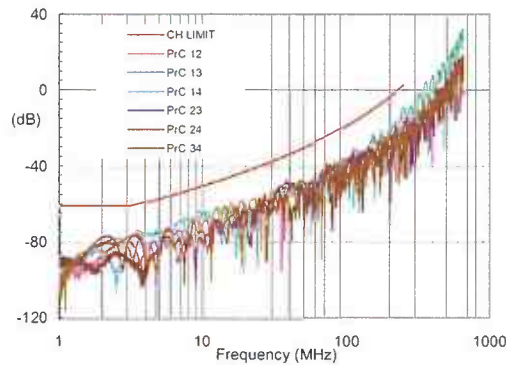
Pair-to-Pair ACR as measured from the TELECOMMUNICATIONS ROOM (TR)



| Worst Case Margin | | | | |
|-------------------|-----------------------|------------------------|-----------------------|---------------------|
| | Frequency Point (MHz) | Calculated Margin (dB) | Calculated Value (dB) | CH LIMIT Value (dB) |
| Swept | 17.5 | 9.8 | -53.7 | -43.9 |
| Freq | | | | |
| Discrete | 1.00 | 26.2 | -87.2 | -61.0 |
| Points | 4.00 | 18.3 | -77.2 | -58.9 |
| | 8.00 | 16.5 | -68.8 | -52.3 |
| | 10.00 | 16.9 | -66.9 | -50.0 |
| | 16.00 | 13.9 | -58.8 | -44.9 |
| | 20.00 | 12.0 | -54.3 | -42.3 |
| | 25.00 | 16.7 | -56.3 | -39.6 |
| | 31.25 | 16.1 | -52.8 | -36.7 |
| | 62.50 | 20.0 | -46.5 | -26.5 |
| | 100.00 | 18.8 | -37.0 | -18.2 |
| | 200.00 | 20.0 | -23.1 | -3.1 |
| | 250.00 | 14.9 | -12.1 | 2.8 |
| | 300.00 | | -11.2 | n/a |
| | 400.00 | | 5.8 | n/a |
| | 500.00 | | 11.9 | n/a |
| | 650.00 | | 24.4 | n/a |

NOTE: Limit line/values provided for reference ONLY and are extrapolated from NEXT Loss and IL limit requirements. $ACR_{limit} = NEXT_{limit} - IL_{limit}$

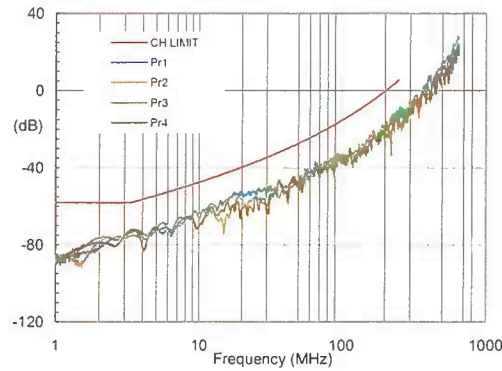
Pair-to-Pair ACR as measured from the WORK AREA (WA)



| Worst Case Margin | | | | |
|-------------------|-----------------------|------------------------|-----------------------|---------------------|
| | Frequency Point (MHz) | Calculated Margin (dB) | Calculated Value (dB) | CH LIMIT Value (dB) |
| Swept | 248.2 | 11.6 | -9.0 | 2.6 |
| Freq | | | | |
| Discrete | 1.00 | 26.9 | -87.9 | -61.0 |
| Points | 4.00 | 16.3 | -75.2 | -58.9 |
| | 8.00 | 17.5 | -69.8 | -52.3 |
| | 10.00 | 18.6 | -68.6 | -50.0 |
| | 16.00 | 14.8 | -59.7 | -44.9 |
| | 20.00 | 17.7 | -60.0 | -42.3 |
| | 25.00 | 17.0 | -56.6 | -39.6 |
| | 31.25 | 16.7 | -53.4 | -36.7 |
| | 62.50 | 19.2 | -45.7 | -26.5 |
| | 100.00 | 17.4 | -35.7 | -18.2 |
| | 200.00 | 18.0 | -21.1 | -3.1 |
| | 250.00 | 11.7 | -8.9 | 2.8 |
| | 300.00 | | -15.3 | n/a |
| | 400.00 | | 7.7 | n/a |
| | 500.00 | | 16.5 | n/a |
| | 650.00 | | 32.5 | n/a |



Power Sum (PS) ACR as measured from the TELECOMMUNICATIONS ROOM (TR)

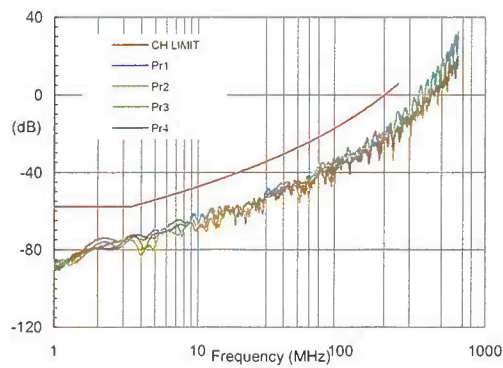


NOTE: Limit line/values provided for reference ONLY and are extrapolated from PSNEXT Loss and IL limit requirements. $psACR_{limit} = psNEXT_{limit} - IL_{limit}$

Worst Case Margin

| | Frequency Point (MHz) | Calculated Margin (dB) | Calculated Value (dB) | CH LIMIT Value (dB) |
|----------|-----------------------|------------------------|-----------------------|---------------------|
| Swept | 17.5 | 11.5 | -52.7 | -41.2 |
| Freq | | | | |
| Discrete | 1.00 | 27.5 | -85.5 | -58.0 |
| Points | 4.00 | 17.6 | -73.9 | -56.4 |
| | 8.00 | 16.1 | -65.8 | -49.7 |
| | 10.00 | 18.7 | -66.1 | -47.4 |
| | 16.00 | 13.9 | -56.2 | -42.3 |
| | 20.00 | 12.7 | -52.3 | -39.7 |
| | 25.00 | 15.6 | -52.5 | -36.9 |
| | 31.25 | 16.1 | -50.1 | -34.0 |
| | 62.50 | 18.5 | -42.2 | -23.7 |
| | 100.00 | 18.4 | -33.7 | -15.4 |
| | 200.00 | 19.5 | -19.7 | -0.1 |
| | 250.00 | 15.8 | -10.0 | 5.8 |
| | 300.00 | | -6.8 | n/a |
| | 400.00 | | 7.6 | n/a |
| | 500.00 | | 14.6 | n/a |
| | 650.00 | | 26.9 | n/a |

Power Sum (PS) ACR as measured from the WORK AREA (WA)



Worst Case Margin

| | Frequency Point (MHz) | Calculated Margin (dB) | Calculated Value (dB) | CH LIMIT Value (dB) |
|----------|-----------------------|------------------------|-----------------------|---------------------|
| Swept | 9.3 | 13.3 | -61.4 | -48.2 |
| Freq | | | | |
| Discrete | 1.00 | 27.2 | -85.2 | -58.0 |
| Points | 4.00 | 16.5 | -72.8 | -56.4 |
| | 8.00 | 16.5 | -66.2 | -49.7 |
| | 10.00 | 18.7 | -66.1 | -47.4 |
| | 16.00 | 15.1 | -57.4 | -42.3 |
| | 20.00 | 18.8 | -58.4 | -39.7 |
| | 25.00 | 17.5 | -54.4 | -36.9 |
| | 31.25 | 15.8 | -49.8 | -34.0 |
| | 62.50 | 18.6 | -42.3 | -23.7 |
| | 100.00 | 17.0 | -32.3 | -15.4 |
| | 200.00 | 19.4 | -19.5 | -0.1 |
| | 250.00 | 14.4 | -8.6 | 5.8 |
| | 300.00 | | -12.5 | n/a |
| | 400.00 | | 7.9 | n/a |
| | 500.00 | | 16.9 | n/a |
| | 650.00 | | 32.9 | n/a |

PRODUCT WARRANTY WITH 25-YEAR CERTIFIED INSTALLATION

The Basic Product Warranty provides that copper, fiber, A/V connectivity and assemblies by Ortronics and Quiktron are covered for a Limited Lifetime against defective materials or workmanship from the date of purchase for the extended life of the building which shall not exceed forty years from the time of installation (the "Limited Lifetime Warranty Period").

The Basic Product Warranty also provides that all other passive structured cabling products by Ortronics and Quiktron will be covered for a period of up to 5-Years against defective materials or workmanship from the date of purchase and up to 1-Year of coverage for active products.

In addition to the Basic Product Warranty, the 25-Year Certified Installation provides that Ortronics-approved cable manufacturers' products used in the Horizontal and Backbone cabling system will be free from material defects and workmanship defects (of the product) for up to 25 years when installed by an Ortronics Certified Contractor at the Certified Installer (CI), Certified Installer Plus (CIP) or Certified Installer Plus-Enterprise Solutions Partner (CIP-ESP) tier (collectively referred to hereafter as "Certified Contractor".) and approved by Ortronics. Ortronics Certified Contractor warrants to the end user that their installation practices and workmanship will adhere to all Standards, or they (the Ortronics Certified Contractor) will fix or repair any installation faults at their cost. The warranty period shall be shown on the front of the Product Warranty Certificate.

Should a defect or problem occur with any Ortronics Product or Ortronics-approved manufacturers' Products used in the Horizontal or Backbone cabling system within the 25-Year Certified Installation warranty period, the item(s) will be replaced by the Ortronics Certified Contractor with labor costs being paid by Ortronics (labor-rate must be preapproved by Ortronics) for the replacement or repair of only the defective Product(s) covered under this warranty program.

WARRANTY CONDITIONS

For this warranty to be valid:

- 1) The System components must have never been used before;
- 2) The System must have been installed by a Certified Contractor authorized by Ortronics in accordance with the Ortronics' installation specifications, the requirements of the above mentioned technical standards, and the terms and conditions specified in the Ortronics Certification Program Agreement.
- 3) All installation records must be updated to reflect any maintenance, movements, additions or changes, etc. Ortronics will not be responsible for moves, additions or changes performed by parties other than the original Certified Contractor;
- 4) All warranty claims must be made to the original Certified Contractor or the local Manufacturer representative, within 5 days of discovery of the alleged defect in the System Products.

In the event of a warranty claim:

- 1) Proper System design, installation, use and maintenance of the Products and System must be demonstrated to Ortronics;
- 2) System documentation and maintenance records must be made available upon request; and
- 3) The end user shall provide free access to the System to both the original Certified Contractor and Ortronics.

WARRANTY EXCLUSIONS

This warranty does not cover:

- 1) Products not specifically designated as being eligible for Warranty coverage when installed in the Structured Cabling Link/Channel or Backbone;
- 2) Products not supplied directly by Ortronics or through channels approved by Ortronics;
- 3) Products used in the Structured Cabling Link/Channel or Backbone, which were falsely represented as being in compliance with the Product, System Link/Channel or Backbone Warranty registration requirements and procedures;
- 4) Defects resulting from non-warranted work areas, patching or equipment cords, or from moves, additions and changes by parties other than the original Certified Contractor; and
- 5) Defects resulting from a noncompliant or improper System design, installation, use, repair, or any System alterations, misuse, neglect, accident or abuse.

WARRANTY LIMITATIONS

This warranty is exclusive and in lieu of all other warranties, whether express or implied, or statutory, including, but not by way of limitation, any warranty of merchantability or fitness for any particular purpose, non-infringement or any other matter. The remedies provided for in the preceding paragraphs shall constitute the sole recourse of end user against Ortronics for breach of any obligations to end user, whether the claim is made in tort or in contract, including claims based on warranty, negligence, strict liability, fraud, misrepresentation, or otherwise. In no event shall Ortronics be liable for special, indirect, incidental or consequential damages (regardless of the form of action, whether in contract or in tort, including negligence), including, without limitation, lost profits or economic damage arising out of the failure of a system. Nor shall the liability of Ortronics for any claims or damage arising out of or connected with this warranty or the manufacture, sale, delivery, installation or use of the Products exceed the purchase price of the Products and the installation.

CLAIM PROCEDURE

- 1) Before making a claim under this warranty and for a claim under this warranty to be valid, the end user must first resolve all non-connectivity hardware and non-cable related causes.
- 2) Warranty claims shall initially be made to the original Certified Contractor, or the local Ortronics representative.
- 3) Cabling System repair and replacement due to component failure will be performed only after Ortronics has reviewed and verified the System prior to the removal, replacement or repair of the defective System Products.
- 4) Any disputes under this warranty shall be subject to and shall be governed by the laws of Connecticut (other than its rules regarding choice of law). Any disputes relating thereto are subject to the jurisdiction of the courts of the State of Connecticut and the federal courts therein, regardless of the location of any installation, which may be subject of a dispute.

WARRANTY REMEDY

Ortronics will utilize static and dynamic testing and verification equipment of its option to validate warranty claims. End user may be subject to expenses associated with invalid warranty claims. For valid warranty claims, Ortronics will, at its option: use a Certified Contractor of its choosing; replace or repair any qualified Product found to be noncompliant, and cover reasonable cost of labor to effect necessary work.

SUBSTITUTION REQUEST FORM

Main Library Remodel

SPECIFICATION NO.: LB23-0178F

Prospective bidders may request substitutions in writing on this form. Substitutions shall be submitted on this form via e-mail to:

Tina Eide, Senior Buyer.

E-mail address: teide@cityoftacoma.org

All e-mails must be received by **Noon on Friday, September 22, 2023**. Where changes in the project documents are required, an addendum will be issued to everyone on the plan holder's list and posted on www.tacomapurchasing.org.

Submitted By

Signature

Company Mastercraft Electric, Inc.

Mailing Address 206 Frontage Rd N, Suite A2

City Pacific

State WA

Zip 98047

Phone 253-737-4367

Fax 253-737-4812

E-mail scotts@mastercraftinc.com

☒ Please check if there are attachments

1. We hereby submit for your consideration the following product instead of the specified item for the above project:

| <u>Section</u> | <u>Page</u> | <u>Line/Paragraph</u> | <u>Specified Item</u> |
|----------------|-------------|-----------------------|-----------------------|
| 27 10 00 | 6 | 2.4 | Station Cabling |

2. Proposed Substitution. Signamax

3. Reason for Substitution. Cost savings while offering same warranty as specified, we are a dealer for Signamax, we put in Signamax at Seattle Public Library

4. Attach complete technical data, catalog cuts, drawings, samples, etc. Exact models and description of products shall be noted with any deviation noted.

5. Include complete information on changes to Drawings, and/or Specifications which proposed substitution will require for its proper installation. N/A

6. Does the substitute affect dimensions shown on Drawings? No

6a. If so, how? _____

7. Describe the effect substitution has on other trades. None

8. Describe differences between proposed substitution and specified item. Only the manufacture, everything else is comparable

9. Manufacturer's warranties of the proposed and specified items are: ☒ Same ☐ Different (explain on attachment)

The undersigned states that the function, appearance and quality are equivalent or superior to the specified item. The undersigned agrees to pay for changes to the building and systems design, including engineering and detailing costs caused by the requested substitution.

SUBSTITUTION REQUEST FORM

Main Library Remodel

SPECIFICATION NO.: LB23-0178F

For Reviewer

- ☐ Approved for Bidding subject to review and approval of Submittals (and as noted below) ☐ Rejected - Inadequate Information
- ☐ Not Accepted ☐ Received Too Late

By _____ Date _____

Remarks

PART NUMBER 556600

ETL Listed and Rated Type CMP Plenum Category 6e Cable



CABLE SPECIFICATIONS

| | |
|---------------------------|--|
| DESCRIPTION | 23 AWG Category 6 Unshielded Twisted Pair (UTP) Cable, Swept Tested to 550MHz. This Cable is Plenum Rated and Verified to Category 6 Electricals |
| CONDUCTOR | 23 AWG Solid Bare Copper |
| INSULATION | FEP |
| COLOR CODE | White-Blue/Blue, White-Orange/Orange, White-Green/Green, White-Brown/Brown |
| SHIELD | N/A |
| DRAIN WIRE | N/A |
| JACKET | Low Smoke PVC .208" Nom. |
| JACKET COLOR | White Jacket |
| MARKING | A B C D E 0 1 2 3 4 5 6 7 8 9 UTP 4/23 C(ETL)US CMP VERIFIED (ETL) CAT6 9700851 550 MHZ TIA-568-C.2 WINDY CITY WIRE MADE IN USA |
| OVERALL DIAMETER | .215" Nom. |
| CABLE WEIGHT | 28 Lbs/Mft. |
| CAPACITANCE | 5.6 nF/100 Meters @ 1 kHz |
| IMPEDANCE | 100 +/- 15 Ohms (1.0 - 250 MHz) |
| DC RESISTANCE | 9.38 Ohms/100 Meters @ 20C |
| TEMPERATURE RATING | 75 C / 300 Volt |
| VOLTAGE RATING | 300 Volts |

INDUSTRY STANDARDS

| | |
|-------------------------|---|
| FLAME RATING | Approved For Plenum Use Without Conduit Per NFPA 262 Flame Test |
| AGENCY APPROVALS | ETL Listed Type CMP, C(ETL)US |



All specifications referenced are nominal measurements unless otherwise noted.

PART NUMBER 556609A

C(ETL)US CMP

■ 0275/0725 FT ● A B C D E 0 1 2 3 4 5 6 7 8 9 FTP 4/23 C(ETL) US CMP CAT 6A 9700851 WINDY CITY WIRE MADE IN USA





CABLE SPECIFICATIONS

DESCRIPTION ANSI/TIA/EIA-568 CATEGORY 6A, NON-SHIELED

CONDUCTOR 23 AWG SOLID BARE COPPER

INSULATION FEP

BISECTOR TAPE POLYOLEFIN

JACKET FRPVC

JACKET COLOR BLUE

COLOR CODE BLUE/WHITE WITH BLUE STRIPE, ORANGE/WHITE WITH ORANGE STRIPE
GREEN/WHITE WITH GREEN STRIPE, BROWN/WHITE WITH BROWN STRIPE

MARKING A B C D E 0 1 2 3 4 5 6 7 8 9 FTP 4/23 C(ETL) US CMP CAT 6A
9700851 WINDY CITY WIRE, MADE IN USA

NOMINAL JACKET O.D. 0.300"

NOMINAL JACKET THICKNESS 0.053"

CABLE WEIGHT 42.40 LBS./1000 FT.

TEMPERATURE INSTALLATION: 0°C TO 60°C; OPERATION: -20°C TO 60°C

INDUSTRY STANDARDS

AGENCIES APPROVALS C(ETL)US CMP



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Tina Eide, Senior Buyer.

E-mail address: teide@cityoftacoma.org

All e-mails must be received by **Noon on Friday, September 22, 2023**. Where changes in the project documents are required, an addendum will be issued to everyone on the plan holder's list and posted on www.tacomapurchasing.org.

Submitted By

Signature

Company Mastercraft Electric, Inc.

Mailing Address 206 Frontage Rd N, Suite A2

City Pacific

State WA

Zip 98047

Phone 253-737-4367

Fax 253-737-4812

E-mail scotts@mastercraftinc.com

☒ Please check if there are attachments

1. We hereby submit for your consideration the following product instead of the specified item for the above project:

| <u>Section</u> | <u>Page</u> | <u>Line/Paragraph</u> | <u>Specified Item</u> |
|-----------------|-------------|-----------------------|-------------------------|
| <u>27 10 00</u> | <u>6, 7</u> | <u>2.5</u> | <u>Station hardware</u> |

2. Proposed Substitution. Signamax

3. Reason for Substitution. Cost savings while offering same warranty as specified, we are a dealer for Signamax, we put in Signamax at Seattle Pubic Library

4. Attach complete technical data, catalog cuts, drawings, samples, etc. Exact models and description of products shall be noted with any deviation noted.

5. Include complete information on changes to Drawings, and/or Specifications which proposed substitution will require for its proper installation. N/A

6. Does the substitute affect dimensions shown on Drawings? No

6a. If so, how? _____

7. Describe the effect substitution has on other trades. None

8. Describe differences between proposed substitution and specified item. Only the manufacture, everything else is comparable

9. Manufacturer's warranties of the proposed and specified items are: ☒ Same ☐ Different (explain on attachment)

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Main Library Remodel

SPECIFICATION NO.: LB23-0178F

For Reviewer

- ☐ Approved for Bidding subject to review and approval of Submittals (and as noted below) ☐ Rejected - Inadequate Information
- ☐ Not Accepted ☐ Received Too Late

By _____ Date _____

Remarks

Specifications

Category 6 MT-Series Unscreened Keystone Jacks

KEY FEATURES

- Exceeds TIA-568-C.2 component performance specifications
- Supports TIA-568-C.2 category 6 100 meter channel performance
- Slim profile for the highest density applications
- Improved wire retention and ease of termination with rear 110 type contacts
- Easy-to-read T568A/B wiring scheme color-coded label
- Compatible with Signamax screened snap-in patch panels and work area faceplates
- Circuit identification icons, dust covers, and 110 protection caps included in kit



The Signamax Category 6 Unscreened MT-Series Keystone Jacks have been designed to meet the need for today's high-bandwidth applications. These connectors are slim in profile for the highest density applications and have the ability to mount either color-coded icons for service identification or dust covers to protect unused jacks from dust and other contaminants.

The contact design provides enhanced plug-to-jack connection integrity, protects against damage caused by insertion of 4- or 6-position plugs. Special design features allow these jacks to be terminated with a standard 110 single-position tool or with the Signamax four-pair tool, and are rated for a minimum of 750 plug insertions providing for the highest level of system reliability.

ORDERING INFORMATION

| PART NO. | DESCRIPTION |
|---------------|--|
| KJ458MT-C6C | Category 6 MT-Series Keystone Jack, T568A/B Wiring, Light Ivory |
| KJ458MT25-C6C | Category 6 MT-Series Keystone Jack, T568A/B Wiring, Light Ivory, 25-Pack |

For other colors add the following to P/N: -WH -YE -OR -RD -BU -GN -GY -BK

SPECIFICATIONS

TRANSMISSION PERFORMANCE

ANSI/TIA-568-C.2: meets or exceeds category 6 (1–250 MHz) component specifications

TRANSMISSION MEDIA

Unscreened twisted pair (U/UTP)

JACK TYPE

8p8c (8-position, 8-contact) "RJ45" style

WIRING SCHEME (See Figure 1)

ANSI/TIA-568-C.2: T568A & T568B

ISO/IEC 11801 2nd Ed.: 8-position pin/pair assignment (1-2/3-6/4-5/7-8)

WIRE GAUGE

22 to 24 AWG (0.644 to 0.511 mm)

ELECTRICAL

Insulation Resistance: Min 500 MOhm @ 100 V_{dc}

Dielectric Withstanding Voltage:

1,000 V_{dc/ac} peak contact-to-contact @ 60 Hz for 1 min

Spring Wire Contact Resistance: Max 20 mOhm

IDC Contact Resistance: Max 2.5 mOhm

Current Rating: See Figure 2

CONSTRUCTION

Housing: High impact thermoplastic, UL94V-0 fire retardant

Jack Spring Wire: Phosphor bronze alloy plated with 50 µin of gold over 70 to 100 µin of nickel

IDC: 110 type, phosphor bronze alloy with 100 µin 100% tin alloy

MECHANICAL

Total Contact Force: Min 800 g for 8 wire leads

Retention: 50 N (11 lbf) for 60 ± 5 s

Mating Cycle Life: Min 750 cycles

FOOTPRINT

Standard keystone footprint

MOUNTING DIMENSIONS:

1.18" D x 0.67" W x 0.76" H (30.0 mm x 16.9 mm x 19.3 mm)

ENVIRONMENTAL CONDITIONS

Operating Temperature: 14 °F to 140 °F (-10 °C to 60 °C)

Storage Temperature: -40 °F to 158 °F (-40 °C to 70 °C)

Operating RH: 93% Max (non-condensing)

COMPLIANCE

ANSI/TIA-568-C.2, IEC 60603-7, FCC Part 68 Subpart F, UL 94V-0

APPLICATIONS

X.21, V.11, S0, ISDN, CSMA/CD 10BASE-T, 100BASE-TX, 100BASE-T4, 100BASE-T2, 1000BASE-T, 10GBASE-T, TR 4/16/100, 100BASE-VG, ATM LAN 25/51/155, TP-PMD

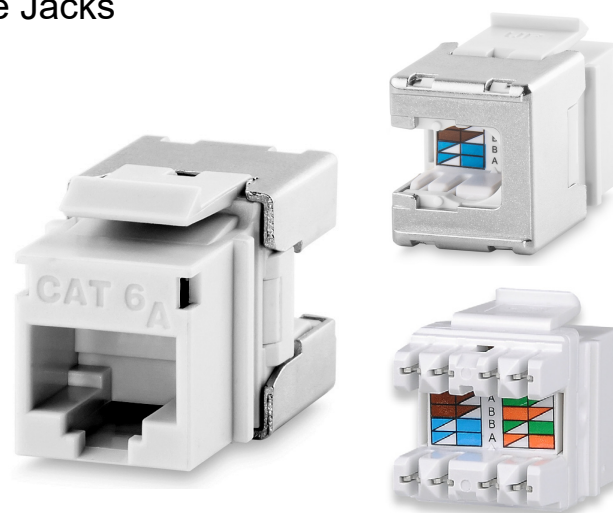
WARRANTY

5 - Year Limited Component

Category 6A MT-Series Unscreened Keystone Jacks

KEY FEATURES

- Exceeds ANSI/TIA-568-C.2 component performance specifications
- Meets IEEE 802.3an 10 Gigabit Ethernet transmission requirements
- Eliminates alien crosstalk with solid-metal cable-retention cap
- Slim profile for the highest density applications
- Improved wire retention and ease of termination with rear 110 type contacts
- Easy-to-read T568A/B wiring scheme color-coded label
- Circuit identification icons, dust covers, and 110 protection caps included in kit



The Signamax Category 6A Unscreened MT-Series Keystone Jacks have been designed to meet the need for today's high-bandwidth applications. These connectors are slim in profile for the highest density applications and have the ability to mount either color-coded icons for service identification or dust covers to protect unused jacks from dust and other contaminants.

Special design features allow these jacks to be terminated with a standard 110 single-position tool or with the Signamax four-pair tool. The contact design provides enhanced plug-to-jack connection integrity, protects against damage caused by insertion of 4- or 6-position plugs, and is rated for a minimum of 750 plug insertions providing for the highest level of system reliability.

ORDERING INFORMATION

| PART NO. | DESCRIPTION |
|--------------|--|
| KJ458MT-C6AC | Category 6A MT-Series Keystone Jack, T568A/B Wiring, Light Ivory |

For other colors add the following to P/N: -WH -YE -OR -RD -BU -GN -GY -BK

SPECIFICATIONS

TRANSMISSION PERFORMANCE

ANSI/TIA-568-C.2: meets or exceeds category 6A (1-500 MHz) component specifications

TRANSMISSION MEDIA

Unscreened twisted pair (U/UTP)

JACK TYPE

8p8c (8-position, 8-contact) "RJ45" style

WIRING SCHEME (See Figure 1)

ANSI/TIA-568-C.2: T568A & T568B

ISO/IEC 11801 2nd Ed.: 8-position pin/pair assignment (1-2/3-6/4-5/7-8)

WIRE GAUGE

22 to 24 AWG (0.644 to 0.511 mm)

ELECTRICAL

Insulation Resistance: Min 500 MOhm @ 100 V_{dc}

Dielectric Withstanding Voltage:

1,000 V_{dc/ac} peak contact-to-contact @ 60 Hz for 1 min

Spring Wire Contact Resistance: Max 20 mOhm

IDC Contact Resistance: Max 2.5 mOhm

Current Rating: See Figure 2

CONSTRUCTION

Housing: High impact thermoplastic, UL94V-0 fire retardant

Jack Spring Wire: Phosphor bronze alloy plated with 50 µin of gold over 70 to 100 µin of nickel

IDC: 110 type, phosphor bronze alloy with 100 µin 100% tin alloy

MECHANICAL

Total Contact Force: Min 800 g for 8 wire leads

Retention: 50 N (11 lbf) for 60±5 s

Mating Cycle Life: Min 750 cycles

FOOTPRINT

Standard keystone footprint

MOUNTING DIMENSIONS:

1.213" D x 0.665" W x 0.76" H (30.8 mm x 16.9 mm x 19.3 mm)

ENVIRONMENTAL CONDITIONS

Operating Temperature: 14 °F to 140 °F (-10 °C to 60 °C)

Storage Temperature: -40 °F to 158 °F (-40 °C to 70 °C)

Operating RH: 93% Max (non-condensing)

COMPLIANCE

ANSI/TIA-568-C.2, IEEE 802.3 ab, FCC Part 68 Subpart F, UL 94V-0

APPLICATIONS

X.21, V.11, S0, ISDN, CSMA/CD 10BASE-T, 100BASE-TX, 100BASE-T4, 100BASE-T2, 1000BASE-T, 10GBASE-T, TR 4/16/100, 100BASE-VG, ATM LAN 25/51/155, TP-PMD

WARRANTY

5 - Year Limited Component

Keystone Plastic Faceplates

Signamax Connectivity Systems offers one of the broadest selections of field-configurable, flush-mount faceplates and multimedia surface-mount boxes. From single-gang faceplates to multimedia surface-mount multi-port boxes, Signamax has the solutions to fit your needs.

ORDERING INFORMATION

Single-Gang Faceplates

Single-gang faceplates are available in 1-, 2-, 3-, 4- or 6-port versions and allow for mounting any combination of keystone jacks and multimedia modules.

| Part Number | Description |
|-------------|---------------------------------------|
| SKF-1 | 1-Port Single-Gang Keystone Faceplate |
| SKF-2 | 2-Port Single-Gang Keystone Faceplate |
| SKF-3 | 3-Port Single-Gang Keystone Faceplate |
| SKF-4 | 4-Port Single-Gang Keystone Faceplate |
| SKF-6 | 6-Port Single-Gang Keystone Faceplate |

Standard color:

Light Ivory

For other colors add the following to P/N: **-BK** (Black) **-GY** (Gray) **-WH** (White) **-DI** (Dark Ivory)



Single-Gang Oversized Faceplates

Single-gang oversized faceplates are available in 1-, 2-, 3-, 4- or 6-port versions and allow for mounting any combination of keystone jacks and multimedia modules. Oversized faceplates are 4.875" x 3.125" x .375", provide a designer look and hide irregular drywall cuts and flaws around outlets.

| Part Number | Description |
|-------------|---|
| SKFM-1 | 1-Port Single-Gang Oversized Keystone Faceplate |
| SKFM-2 | 2-Port Single-Gang Oversized Keystone Faceplate |
| SKFM-3 | 3-Port Single-Gang Oversized Faceplate |
| SKFM-4 | 4-Port Single-Gang Oversized Faceplate |
| SKFM-6 | 6-Port Single-Gang Oversized Faceplate |

Standard color:

Light Ivory

For other colors add the following to P/N: **WH** (White)



Single-Gang Faceplates with Labeling Windows

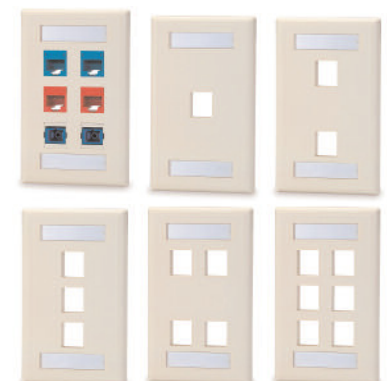
Faceplates are available in 1-, 2-, 3-, 4- or 6-port versions and allow for mounting any combination of keystone jacks and multimedia modules. These faceplates feature top and bottom designation labeling windows for convenient faceplate identification.

| Part Number | Description |
|-------------|---|
| SKFL-1 | 1-Port Single Gang Keystone Faceplate with Labeling |
| SKFL-2 | 2-Port Single Gang Keystone Faceplate with Labeling |
| SKFL-3 | 3-Port Single Gang Keystone Faceplate with Labeling |
| SKFL-4 | 4-Port Single Gang Keystone Faceplate with Labeling |
| SKFL-6 | 6-Port Single Gang Keystone Faceplate with Labeling |

Standard color:

Light Ivory

For other colors add the following to P/N: **-BK** (Black) **-GY** (Gray) **-WH** (White) **-DI** (Dark Ivory)



Keystone Wall-Mount Phone Plates

Wall mount phone plates provide an easy-to-install method for mounting any wall mountable phone.

| Part Number | Description |
|-------------|---|
| SKF-1P | 1-Port Plastic Keystone Wall Mount Phone Plate, Light Ivory |
| SKF-1P-WH | 1-Port Plastic Keystone Wall Mount Phone Plate, White |

Keystone Plastic Faceplates

Single-Gang Angled Faceplates with Labeling Windows

Angled faceplates are available in 2- and 4-port versions. These plates allow an angled patch cord exit to prevent damage and help maintain the bend radius of patch cords. Faceplates feature designation labeling windows for faceplate identification.

| Part Number | Description |
|-------------|-------------|
|-------------|-------------|

| | |
|---------|--|
| SKFLA-2 | 2-Port Single-Gang Angled Keystone Faceplate with Labeling |
| SKFLA-4 | 4-Port Single-Gang Angled Keystone Faceplate with Labeling |

Standard color:

Light Ivory

For other colors add the following to P/N:

-WH (White)

-DI (Dark Ivory)

Double-Gang Faceplates

Double-gang faceplates are available in 6-, 8- and 12-port versions and allow for mounting any combination of keystone jacks and multimedia modules.

| Part Number | Description |
|-------------|-------------|
|-------------|-------------|

| | |
|--------|--|
| DKF-6 | 6-Port Double-Gang Keystone Faceplate |
| DKF-8 | 8-Port Double Gang Keystone Faceplate |
| DKF-12 | 12-Port Double-Gang Keystone Faceplate |

Standard color:

Light Ivory

For other colors add the following to P/N:

-BK (Black)

-GY (Gray)

-WH (White)

Double-Gang Faceplates with Labeling Windows

Double-gang faceplates are available in 8- and 12-port versions and allow for mounting any combination of keystone jacks and multimedia modules. These faceplates feature top and bottom designation labeling windows for convenient faceplate identification. Plates are supplied with label cards and clear labeling window covers.

| Part Number | Description |
|-------------|-------------|
|-------------|-------------|

| | |
|---------|--|
| DKFL-6 | 6-Port Double-Gang Keystone Faceplate with Labeling |
| DKFL-12 | 12-Port Double-Gang Keystone Faceplate with Labeling |

Standard color:

Light Ivory

For other colors add the following to P/N:

-BK (Black)

-GY (Gray)

-WH (White)

Double-Gang Angled Faceplate with Labeling Windows

Angled faceplate is available in an 8-port version. This plate allows an angled patch cord exit to prevent damage and help maintain the bend radius of patch cords. Faceplate features top and bottom designation labeling windows for convenient faceplate identification. Faceplate is supplied with label cards and clear labeling window covers.

| Part Number | Description |
|-------------|-------------|
|-------------|-------------|

| | |
|---------|--|
| DKFLA-8 | 8-Port Double-Gang Angled Keystone Faceplate with Labeling |
|---------|--|

Standard color:

Light Ivory

For other colors add the following to P/N:

-WH (White)

SPECIFICATIONS

• CONSTRUCTION

High impact thermoplastic, UL94V-0 fire retardant

• OVERALL DIMENSIONS

| | | |
|--------------|------------|------------|
| Single gang: | W 69.9 mm | H 114.3 mm |
| | W 2.75 in | H 4.50 in |
| Oversized: | W 79.5 in | H 124.0 mm |
| | W 3.13 in | H 4.88 in |
| Double gang: | W 116.8 mm | H 114.3 mm |
| | W 4.60 in | H 4.50 in |

• MOUNTING DIMENSIONS

Mounting screw holes distance – 83.3 mm (3.28 in)

• KEYSTONE MODULE MOUNTING DIMENSIONS

Standard keystone footprint

Panel opening: 14.7 mm (0.579 in) x 19.30 mm (0.760 in)

• OPERATING TEMPERATURE

-10 °C—+60 °C (-14 °F—+140 °F)



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SPECIFICATION NO.: LB23-0178F

Prospective bidders may request substitutions in writing on this form. Substitutions shall be submitted on this form via e-mail to:

Tina Eide, Senior Buyer.

E-mail address: teide@cityoftacoma.org

All e-mails must be received by **Noon on Friday, September 22, 2023**. Where changes in the project documents are required, an addendum will be issued to everyone on the plan holder's list and posted on www.tacomapurchasing.org.

Submitted By

Signature 

Company Mastercraft Electric, Inc.

Mailing Address 206 Frontage Rd N, Suite A2

City Pacific State WA Zip 98047

Phone 253-737-4367 Fax 253-737-4812 E-mail scotts@mastercraftinc.com

☒ Please check if there are attachments

1. We hereby submit for your consideration the following product instead of the specified item for the above project:

| <u>Section</u> | <u>Page</u> | <u>Line/Paragraph</u> | <u>Specified Item</u> |
|-----------------|-------------|-----------------------|--|
| <u>27 10 00</u> | <u>7</u> | <u>2.6</u> | <u>Voice/Data Termination Hardware</u> |

2. Proposed Substitution. Signamax

3. Reason for Substitution. Cost savings while offering same warranty as specified, we are a dealer for Signamax, we put in Signamax at Seattle Pubic Library

4. Attach complete technical data, catalog cuts, drawings, samples, etc. Exact models and description of products shall be noted with any deviation noted.

5. Include complete information on changes to Drawings, and/or Specifications which proposed substitution will require for its proper installation. N/A

6. Does the substitute affect dimensions shown on Drawings? No

6a. If so, how?

7. Describe the effect substitution has on other trades. None

8. Describe differences between proposed substitution and specified item. Only the manufacture, everything else is comparable

9. Manufacturer's warranties of the proposed and specified items are: ☒ Same ☐ Different (explain on attachment)

The undersigned states that the function, appearance and quality are equivalent or superior to the specified item. The undersigned agrees to pay for changes to the building and systems design, including engineering and detailing costs caused by the requested substitution.

SUBSTITUTION REQUEST FORM

Main Library Remodel

SPECIFICATION NO.: LB23-0178F

For Reviewer

☐ Approved for Bidding subject to review and approval of Submittals (and as noted below) ☐ Rejected - Inadequate Information

☐ Not Accepted ☐ Received Too Late

By _____ Date _____

Remarks

Product Specifications

Category 6 MT-Series Unscreened Patch Panels



KEY FEATURES

- Exceeds ANSI/TIA-568-C.2 component performance specifications
- Supports TIA-568-C.2 category 6 100 meter channel performance
- Removable rear cable management bar
- Improved wire retention and ease of termination with rear 110 type contacts
- Slim profile for the highest density applications
- Cold-rolled steel construction for maximum strength and durability
- Easy-to-read T568A/B wiring scheme color-coded label

The Signamax Category 6 MT-Series Unscreened Patch Panels are designed to offer a complete panel and jack option. The MT-series includes the option of a 24, 48, or 72 port panel, black snap in keystone jacks, and a cable management bar. This unique design allows easy termination and greater flexibility for future adds, moves or changes, giving installers the perfect cost effective solution for Category 6 applications.

The patch panels rolled-edge steel construction eliminates panel flex, and in lieu of fixed termination, a standard single-position 110 termination tool or a specialized Signamax multi-pair tool can be used. For easy circuit identification, each port designation features a labeling area with a reference number. The keystone jacks are rated for a minimum of 750 plug insertions providing for the highest level of system reliability.

ORDERING INFORMATION

| PART NO. | DESCRIPTION |
|-----------|---|
| 24458-C6C | 24-Port Category 6 MT-Series Patch Panel 1.75" H |
| 48458-C6C | 48-Port Category 6 MT-Series Patch Panel, 3.50" H |
| 72458-C6C | 72-Port Category 6 MT-Series Patch Panel, 3.50" H |

Panels are supplied as a kit, which includes the panel, black MT-Series unscreened jacks per port count, a cable management bar per RMU, and cable ties.

For panels with other keystone jack color options contact Customer Service.

SPECIFICATIONS

TRANSMISSION PERFORMANCE

ANSI/TIA-568-C.2: exceeds category 6 (1-250 MHz) component specifications

TRANSMISSION MEDIA

Unscreened twisted pair (U/UTP)

JACK TYPE

8p8c (8-position, 8-contact) "RJ45" type

WIRING SCHEME (See Figure 1)

ANSI/TIA-568-C.2: T568A & T568B

ISO/IEC 11801 2nd Ed.: 8-position pin/pair assignment (1-2/3-6/4-5/7-8)

WIRE GAUGE

22 to 24 AWG (0.64 to 0.51 mm)

ELECTRICAL

Insulation Resistance: Min 500 MOhm @ 100 V_{dc}

Dielectric Withstanding Voltage:

1,000 V_{dclac} peak contact-to-contact @ 60 Hz for 1 min

Spring Wire Contact Resistance: Max 20 mOhm

IDC Contact Resistance: Max 2.5 mOhm

Current Rating: See Figure 2

CONSTRUCTION

Panel:

Front: Steel with corrosive resistant black finish

Rear: Steel

Cable management bar: Thermoplastic with steel brackets

Jack:

Housing: High-impact thermoplastic, UL94V-0 fire-retardant

Contacts: Phosphor bronze alloy plated with min 50 µin of gold over 70 µin to 100 µin of nickel plating

IDC: 110 type, phosphor bronze alloy with 100-µin 100% tin alloy

MECHANICAL

Total Contact Force: Min 800 g for 8 wire leads with FCC compliant 8p8c plug

Retention: 50 N (11 lbf) for 60 ± 5 s

Mating Cycle Life: Min 750 cycles with FCC compliant 8p8c plug

MOUNTING DIMENSIONS:

Panel: 19-in rack mountable

Depth:

Management Bar Installed: 6.0" (153 mm)

Management Bar Uninstalled: 1.5" (38 mm)

Height:

24458-C6C: 1 RMU (1.75" (44.45 mm))

48458-C6C: 2 RMU (3.50" (88.90 mm))

72458-C6C: 2 RMU (3.50" (88.90 mm))

Jack: 1.21" D x 0.67" W x 0.76" H (30.8 mm x 16.9 mm x 19.3 mm)

ENVIRONMENTAL CONDITIONS

Operating Temperature: 14 °F to 140 °F (-10 °C to 60 °C)

Storage Temperature: -40 °F to 158 °F (-40 °C to 70 °C)

Operating RH: 93% Max (non-condensing)

COMPLIANCE

ANSI/TIA-568-C.2, IEEE 802.3 ab, FCC Part 68 Subpart F, UL 94V-0, UL 1863, IEC 60603-7

APPLICATIONS

X.21, V.11, S0, ISDN, CSMA/CD 10BASE-T, 100BASE-TX, 100BASE-T4, 100BASE-T2, 1000BASE-T, 10GBASE-T, TR 4/16/100, 100BASE-VG, ATM LAN 25/51/155, TP-PMD

WARRANTY

5 - Year Limited Component

Figure 1: Wiring Schemes

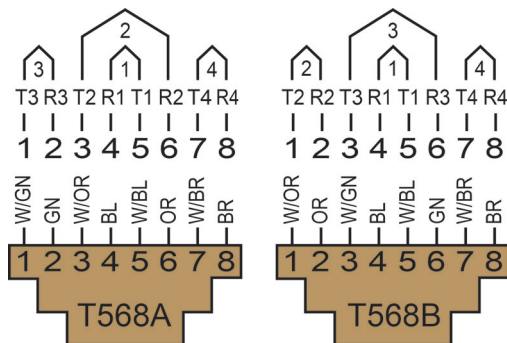
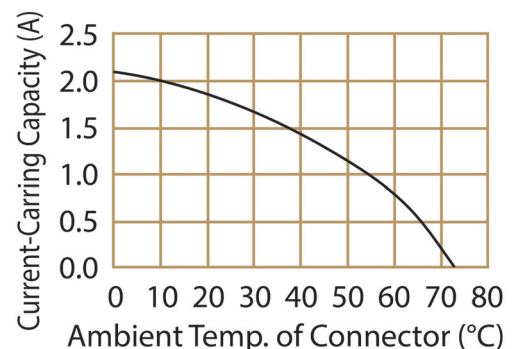


Figure 2: Current Rating



Detailed Back View

Cable management bar snaps into the back of the panel.



Grounding lug for attaching 6 AWG (4.5 mm) ground conductor.

KEEPING YOUR WORLD CONNECTED

Product Specifications

Category 6A MT-Series Unscreened Patch Panels



KEY FEATURES

- Exceeds ANSI/TIA-568-C.2 component performance specifications
- Meets IEEE 802.3an 10 Gigabit Ethernet transmission requirements
- Eliminates alien crosstalk with solid-metal cable-retention cap on connector modules
- Removable rear cable management bar
- Improved wire retention and ease of termination with rear 110 type contacts
- Slim profile for the highest density applications
- Cold-rolled steel construction for maximum strength and durability
- Easy-to-read T568A/B wiring scheme color-coded label

The Signamax Category 6A MT-Series Unscreened Patch Panels are designed to offer a complete panel and jack option. The MT-series includes the option of a 24, 48, or 72 port panel, black snap in keystone jacks, and a cable management bar. This unique design allows easy termination and greater flexibility for future adds, moves or changes, giving installers the perfect cost effective solution for Category 6A applications.

The patch panels rolled-edge steel construction eliminates panel flex, and in lieu of fixed termination, a standard single-position 110 termination tool or a specialized Signamax multi-pair tool can be used. For easy circuit identification, each port designation features a labeling area with a reference number. The keystone jacks are rated for a minimum of 750 plug insertions providing for the highest level of system reliability.

ORDERING INFORMATION

| PART NO. | DESCRIPTION |
|-----------|--|
| 24458-C6A | 24-Port Category 6A MT-Series Patch Panel 1.75" H |
| 48458-C6A | 48-Port Category 6A MT-Series Patch Panel, 3.50" H |
| 72458-C6A | 72-Port Category 6A MT-Series Patch Panel, 3.50" H |

Panels are supplied as a kit, which includes the panel, black MT-Series unscreened jacks per port count, a cable management bar per RMU, and cable ties.

For panels with other keystone jack color options contact Customer Service.

SPECIFICATIONS

TRANSMISSION PERFORMANCE

ANSI/TIA-568-C.2: exceeds category 6A (1-500 MHz) component specifications

TRANSMISSION MEDIA

Unscreened twisted pair (U/UTP)

JACK TYPE

8p8c (8-position, 8-contact) "RJ45" type

WIRING SCHEME (See Figure 1)

ANSI/TIA-568-C.2: T568A & T568B

ISO/IEC 11801 2nd Ed.: 8-position pin/pair assignment (1-2/3-6/4-5/7-8)

WIRE GAUGE

22 to 24 AWG (0.64 to 0.51 mm)

ELECTRICAL

Insulation Resistance: Min 500 MOhm @ 100 V_{dc}

Dielectric Withstanding Voltage:

1,000 V_{dc/ac} peak contact-to-contact @ 60 Hz for 1 min

Spring Wire Contact Resistance: Max 20 mOhm

IDC Contact Resistance: Max 2.5 mOhm

Current Rating: See Figure 2

CONSTRUCTION

Panel:

Front: Steel with corrosive resistant black finish

Rear: Steel

Cable management bar: Thermoplastic with steel brackets

Jack:

Housing: High-impact thermoplastic, UL94V-0 fire-retardant

Contacts: Phosphor bronze alloy plated with min 50 µin of gold over 70 µin to 100 µin of nickel plating

IDC: 110 type, phosphor bronze alloy with 100-µin 100% tin alloy

MECHANICAL

Total Contact Force: Min 800 g for 8 wire leads with FCC compliant 8p8c plug

Retention: 50 N (11 lbf) for 60 ± 5 s

Mating Cycle Life: Min 750 cycles with FCC compliant 8p8c plug

MOUNTING DIMENSIONS:

Panel: 19-in rack mountable

Depth:

Management Bar Installed: 6.0" (153 mm)

Management Bar Uninstalled: 1.5" (38 mm)

Height:

24458-C6A: 1 RMU (1.75" (44.45 mm))

48458-C6A: 2 RMU (3.50" (88.90 mm))

72458-C6A: 2 RMU (3.50" (88.90 mm))

Jack: 1.21" D x 0.67" W x 0.76" H (30.8 mm x 16.9 mm x 19.3 mm)

ENVIRONMENTAL CONDITIONS

Operating Temperature: 14 °F to 140 °F (-10 °C to 60 °C)

Storage Temperature: -40 °F to 158 °F (-40 °C to 70 °C)

Operating RH: 93% Max (non-condensing)

COMPLIANCE

ANSI/TIA-568-C.2, IEEE 802.3 ab, FCC Part 68 Subpart F, UL 94V-0, UL 1863, IEC 60603-7

APPLICATIONS

X.21, V.11, S0, ISDN, CSMA/CD 10BASE-T, 100BASE-TX, 100BASE-T4, 100BASE-T2, 1000BASE-T, 10GBASE-T, TR 4/16/100, 100BASE-VG, ATM LAN 25/51/155, TP-PMD

WARRANTY

5 - Year Limited Component

Figure 1: Wiring Schemes

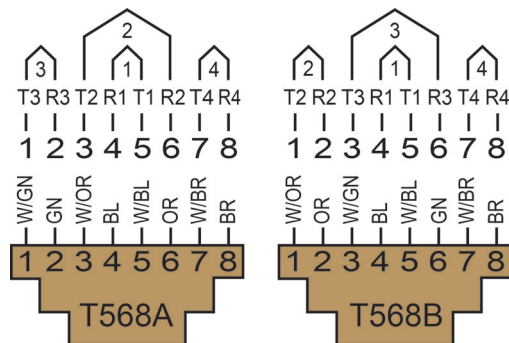
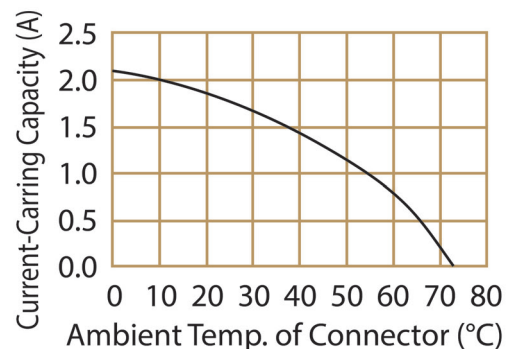


Figure 2: Current Rating



Detailed Back View

Cable management bar snaps into the back of the panel.



Grounding lug for attaching 6 AWG (4.5 mm) ground conductor.

KEEPING YOUR WORLD CONNECTED

Figure 1: Wiring Schemes

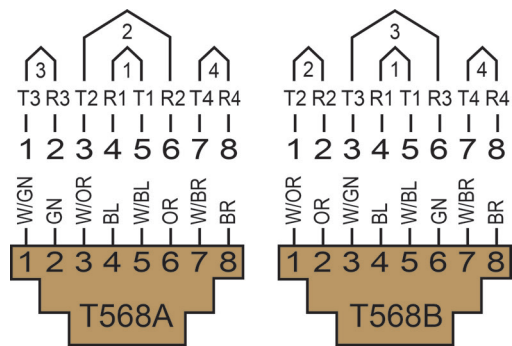


Figure 2: Current Rating

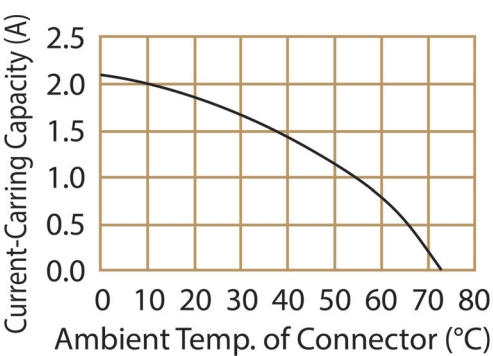


Figure 1: Wiring Schemes

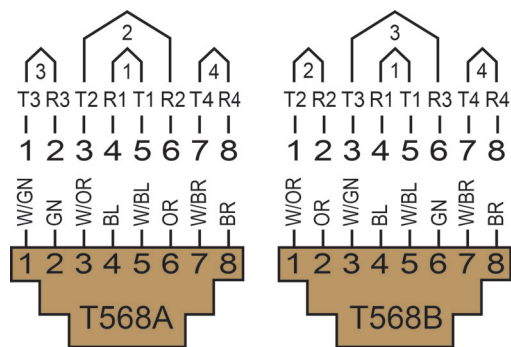
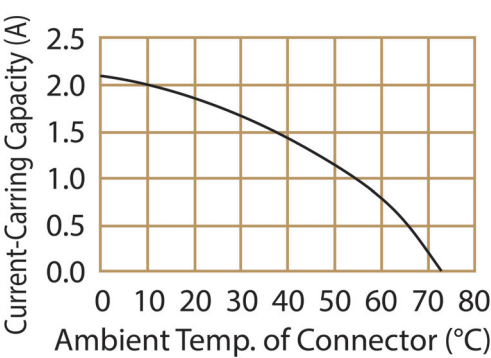


Figure 2: Current Rating



PART 1 - GENERAL

1.1 SECTION INCLUDES

- A . Delegated design of metal fabrications.
- B . Metal Fabrications, including custom gate and security enclosure panels and supports at northwest entry, custom interior stair supports and stringers, and cast stair nosings.

1.2 RELATED REQUIREMENTS

- A . 013515 – LEED Certification Procedures: For additional requirements of LEED Certification.
- B . 01 74 19 – Construction Waste Management and Disposal: Limitations on disposal of removed materials; requirements for recycling.
- C . 057300 – Decorative Metal Railings: Fabrications associated with decorative railings.
- D . 09 90 00 – Painting and Coating: For surface preparation, priming, and topcoat requirements.

1.3 ADMINISTRATIVE REQUIREMENTS

- A . Preinstallation Meeting: Convene one week before starting work of this section in accordance with Section 01 30 00 - Administrative Requirements.
 - 1. Review preparation and installation procedures and coordinating and scheduling required with related work.
 - 2. Review FM and Owner requirements for quality assurance and testing

1.4 SUBMITTALS

- A . Qualification Data: For fabricator and design engineer.
- B . Delegated-Design Submittal:
 - 1. For assemblies indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 - 2. Stamped engineering calculations for ladders and connections to structure.
- C . Product Data: On all cleaning, galvanizing, and finishing products, including VOC content.
- D . Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
- E . LEED Submittals: For components of this section submit the following in compliance with Section 013515 – LEED Certification Procedures.
 - 1. LEED Submittal Coversheet.
 - 2. Low-Emitting Materials Submittals:

- a. EQ Credit Low Emitting Materials, Option 1: General Emissions Evaluation. Documentation certifying all paints and coatings, ceilings, flooring and insulation products comply with current California Department Public Health Standard (CDPH) Method V1.1-2010 or later.
 - b. EQ Credit Low Emitting Materials, Option 1: Additional VOC content requirements for wet-applied paints, coatings applied onsite: Certification from the manufacturer that the product meets the applicable VOC limits listed in Section 013515 – LEED Certification Procedures.
 - 3. Materials and Resources Submittals:
 - a. MR Credit BPDO – Material Ingredients: Manufacturer’s documentation demonstrating product claims of extended producer responsibility program, recycled content, or FSC certified wood, in accordance with Section 013515 – LEED Certification Procedures (LEEDv4).
 - 1) Include manufacturer documentation confirming city/ state/ county of material extraction, manufacturer and purchase and air distance from these locations to project site for products extracted and manufactured within 100 miles of the project site.
 - F. Welder’s Certificates: Submit certification for welders employed on the project, verifying AWS qualification within the previous 12 months.
 - G. Maintenance Data: For users operation and maintenance of system including:
 - 1. Methods for maintaining system's materials and finishes.
 - 2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.
- 1.5 QUALITY ASSURANCE
- A. Designer Qualifications: Professional structural engineer with 5 years of documented experience in design of this work and licensed in the location of the project.
 - B. Fabricators Qualifications: A qualified fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel (AC172). Company specializing in performing the work of this section with minimum 5 years' experience on projects of similar size and complexity.
- 1.6 DELIVERY, STORAGE, AND HANDLING
- A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.
 - B. As required by SMACNA Guideline Chapter 3 and Section 013515 – LEED Certification Procedures.

PART 2 - PRODUCTS

2.1 DESCRIPTION

- A. Items designated and shop fabricated out of steel and aluminum sections, tubing, plates and pipe for exposed and concealed locations.

2.2 PERFORMANCE AND DESIGN CRITERIA

- A. Provide materials that meet the guidelines in Section 013515 – LEED Certification Procedures.
1. EQ Credit Low Emitting Materials, Option 1: Meet emissions testing and requirements of CDPH Standard Test Method V1.1 – 2010 or later.
 2. EQ Credit Low Emitting Materials, Option 1: Meet the applicable VOC limits of the California Air Resources Board (CARB) 2007, Suggested Control Measure (SCM) for Architectural Coatings, or the South Coast Air Quality Management District (SCAQMD) Rule 113, effective June 3, 2011.
 - a. Applies only to interior paints and coatings, wet-applied onsite within the weather barrier.

2.3 MATERIALS

- A. Steel:
1. Steel Sections:
 - a. ASTM 36/A36M.
 2. Steel Tubing:
 - a. ASTM A500/A500M, Grade B cold-formed structural tubing.
 3. Plates:
 - a. ASTM A283/A283M.
 4. Pipe:
 - a. ASTM A53/A53M, Grade B Schedule 40, black finish.
 5. Slotted Channel Framing:
 - a. ASTM A653/A653M, Grade 33.
 6. Slotted Channel Fittings:
 - a. ASTM A1011/A1011M.
 7. Fasteners:
 - a. Metal: Match fasteners exposed to view with the material and color/finish of material being used.
 - 1) Profile: countersunk head with square drive on fasteners.
 - b. Galvanized Steel: Fasteners not exposed to view unless otherwise noted.
 - 1) Profile: countersunk head with square drive on fasteners.
 8. Bolts, Nuts, and Washers:
 - a. ASTM A325 (ASTM A325M), Type 1, galvanized to ASTM A153/A153M where connecting galvanized components.
 9. Welding Materials:
 - a. AWS D1.1/D1.1M; type required for materials being welded.
 10. Touch-Up Primer for Galvanized Surfaces: See Section 09 90 00.

B. Cast Metals

1. Metal Stair Nosing

- a. 5/16" thick surface, 1/4" angled nose, 3" depth, length to match tread
- b. Basis of Design: Ferro-Grit Abrasive Cast Safety Treads and Nosing by Wooster Products.
- c. Type 101: for recessed installation on wood stair treads.
- d. Finish: Non-slip.
- e. Location: New interior stair
- f. Finish: Black; fasteners to match

C. Perforated Metal Sheets

2. Fence Infill Panels

- a. **16 gauge (.0635") 5/16" thick, galvanized steel, G90, Mill Finish, 3/16" round on 1/4" staggered centers 51% open area**
- b. **Basis of Design: McNICHOLS Perforated Metal**
- c. **Finish: Galvanized Steel G90**
- d. **Location: Exterior fence at tenant entry**
- e. **Finish: Paint, See paragraph 2.6 below and Section 09 90 00.**

2.4 FABRICATION

- A. Fit and shop assemble items in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Continuously seal joined members by continuous welds.
- D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.5 FABRICATION TOLERANCES

- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch.
- C. Maximum Misalignment of Adjacent Members: 1/16 inch.
- D. Maximum Bow: 1/8 inch in 48 inches.
- E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

2.6 FINISHES

A. Steel:

1. Prime paint all steel items.
 - a. Exceptions:
 - 1) Galvanize items to be embedded in concrete or masonry.
 - 2) Galvanize items specified for galvanized finish.
 - 3) Do not prime surfaces indicated for spray fire proofing, weathering steel, clear finish, or blackened steel finish.
 - 4) Field welding is required.
 - b. See Section 09 90 00 – Painting and Coating for field finish painting
2. Prime Painting: One coat.
3. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating.
4. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating.

2.7 ACCESSORIES

- A. All accessory materials required by the fabricator for a complete installation of the installed products in a manner that meets the Performance and Design Criteria.
- B. All accessory materials required to comply with EQ Credit: Low Emitting Materials, Option 1 in accordance with Section 013515 – LEED Certification Procedures.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions meet the manufacturer's requirements before starting work.
- B. Verify products have been stored, and will be installed, in accordance with project's Construction Indoor Air Quality Management Plan specified in Section 013515 – LEED Certification Procedures.

3.2 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components indicated.
- D. Perform field welding in accordance with AWS D1.1/D1.1M
- E. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.
- F. All miscellaneous installation materials required to comply with EQ credit: Low Emitting Materials, Option 1 in accordance with Section 013515 – LEED Certification Procedures.

3.3 INSTALLATION

- A . All paintings and coatings, including accessories, applied on site must comply with the VOC limits, emissions testing and Submittal requirements for IEQ Credit Low-Emitting Materials.

3.4 INSTALLATION TOLLERANCES

- A . Maximum Variation From Plumb: 1/4 inch per story, non-cumulative
- B . Maximum Offset From True Alignment: 1/4 inch.
- C . Maximum Out-of-Position: 1/4 inch

3.5 CLEANING

- A . Dispose of all waste material in accordance with Section 01 74 19 - Construction Waste Management and Disposal and project's Waste Management Plan.

3.6 PROTECTION

- A . Protect installed work as required by the fabricator to maintain finishes, product performance, design criteria, and warranty.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A . Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 00 and Division 01 Specification Sections, apply to this Section.
- B . Requirements of Section 20 05 00 apply to this Section.

1.2 WORK INCLUDED

- A . Plumbing Fixtures and Trim.
- B . Installation/Connection of Equipment Specified Elsewhere.
- C . Adjustment and Cleaning.

1.3 DEFINITIONS

- A . "Plumbing Brass" means "P-traps, stops, strainers, tailpieces, flanges, and other brass fittings and accessories NOT including faucets or stops."
- B . "Trim" includes all plumbing brass items, faucets, and any fixture accessories.
- C . "Accessible" refers to the American's with Disabilities Act, and infers that these fixtures will meet Federal and local code requirements.
- D . "Lead-Free" means not containing more than 0.2% lead in solder and flux; and not more than a weighted average of 0.25% lead in wetted surfaces of pipes, pipe and plumbing fittings and fixtures.

1.4 REFERENCES

- A . UPC: Uniform Plumbing Code.
- B . NSF/ANSI Standard 61: Drinking Water System Components – Health Effects.

1.5 SUBMITTALS

- A . General: All submittals shall comply with Section 20 05 00.
- B . Product Data: Submit product data for all plumbing fixtures, plumbing trim, and water heaters.

1.6 GENERAL REQUIREMENTS

- A . Fixture Quality: Provide new fixtures and fittings, approved, free from flaws and blemishes with finished surfaces clear, smooth and bright. Visible parts of fixture brass and accessories, and all items located in accessible cabinet spaces, shall be heavily chrome plated. All stops, P-traps and items exposed to view shall be chrome plated (except where specifically noted otherwise).

- B. Code Compliance: All products and connections shall be in compliance with code, local Utilities Department standards, and Health Department requirements.
- C. Off-The-Floor Mounted Fixtures - Movement:
 - 1. General: Off-the-floor (i.e. wall) mounted fixtures shall be supported, anchored, and braced in a manner so that the fixture does not move more than the values indicated below with the imposed forces as indicated; nor shall the fixture or associated fittings leak or suffer damage of any kind. Deflection shall be measured at the front most part of the fixture (i.e. the point on the fixture furthest away from the wall containing the fixture supports), with the load imposed at the same location as the measured deflection. Deflection shall not be exceeded in any direction with the force imposed in any direction.
 - 2. Water Closets: 1/16-inch with a 300 pound force.
 - 3. Other Fixtures: 1/16-inch with a 150 pound force.
- D. Spare Parts: Provide two spare stop valves.

1.7 QUALITY ASSURANCE

- A. General: Provide quality assurance checks specified in Section 20 05 00 prior to submitting product data. By submitting products for Engineer's review, the Contractor is confirming that such checks have been performed and that the products are suitable for the intended installation and use.
- B. Fixtures:
 - 1. Types: Verify specified fixture types with the Architectural and Plumbing drawings to confirm the requirements are consistent (e.g. fixtures are wall mounted versus floor mounted type, locations of ADA fixtures match, etc.). Where conflicts occur clearly identify the issue on the fixture submittal along with a proposed resolution; or resolve prior to making the submittal by the project RFI process.
 - 2. Space Verification: Prior to ordering any fixtures or making submittals, Contractor shall check the drawings and verify that all fixtures will fit the space available (i.e. fixtures fit any cabinets fixtures are to be installed in; fixtures have adequate access clearances for proper use; etc.).
- C. Lead-Free Requirement: All items in contact with potable water shall be lead free. Fixtures used to dispense potable water for drinking shall meet the requirements of NSF/ANSI 61.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Products shall comply with Section 20 05 00, Paragraph 2.01, Acceptable Manufacturers.
- B. Water Closets: Kohler, American Standard, Eljer, Mansfield.
- C. Vitreous china (other than water closets) and enameled cast iron fixtures: American Standard; Kohler, Eljer, Mansfield.
- D. Water Closet Seats: Church; Beneke; Olsonite; Kohler; Bemis.

- E . Carriers: Josam; J.R. Smith; Wade; Zurn.
- F . Stainless Steel Sinks: Just; Elkay, Franke.
- G . Service Sinks: Fiat; Stern and Williams; Swan; Kohler; Mustee.
- H . Plumbing Brass: McGuire; American Standard; Brasscraft; Dearborn Brass; Chicago Faucet; Crane; Eljer; Frost; Kohler; Speakman; Symmons; T & S Brass; Elkay; ProFlo.
- I . Faucets: Chicago Faucet (no substitutions).
- J . Stops: McGuire; Brasscraft; ProFlo; Chicago Faucet.
- K . Flush Valves: Sloan, Zurn.
- L . Hot Water Temperature Limiting Valve: Symmons, Watts, Chicago Faucet, Acorn Controls, Leonard, Cash Acme.

2.2 PLUMBING FIXTURES

A . General:

1. Plumbing Fixtures are listed below by reference numbers, corresponding to the reference number adjoining these items on the drawings.
2. All vitreous china and enameled cast iron fixtures shall be finished white unless specifically noted otherwise.
3. All stainless steel sinks shall be sound deadened, and shall have faucet ledge (except where noted specifically without ledge).
4. In interests of Owner's Standardization, fixtures of similar type shall be product of one manufacturer; trim of similar type shall be product of one manufacturer.

B . Water Closets:

P-1A Water Closet - Wall Hung - ADA:

Water Closet: Kohler "Kingston-Lite", No. K-4325, vitreous china, elongated bowl, wall mounted, siphon jet action bowl with 1-1/2" top spud, and 1.28 gallon flush.

Flush Valve: Sloan "Ecos" 8111-1.28/1.1 chrome-plated low consumption dual flush battery operated sensor operated flush valve with vacuum breaker, quiet-action, and screw driver stop.

Seat: Kohler "Lustra", No. K-4670-SC, white plastic elongated seat, open-front and stainless steel self-sustaining check hinge.

ADA: Configure and install for ADA access. Verify with Architectural drawings for mounting heights and off-center stall dimensions. Provide with flush valve so that handle is on wide side of stall.

P-1B Water Closet - Wall Hung:

Same as P-1A fixture, except that fixture shall be mounted for normal use.

C . Lavatories:

P-3A Lavatory - Wall Hung - ADA:

Lavatory: Kohler “Greenwich”, No. K-2032, 20" x 18", vitreous china lavatory with 4" faucet centers, overflow for use with concealed arm carrier.

Plumbing Brass: Kohler No. K-7129 lavatory drain with perforated grate and 1-1/4" tailpiece; Kohler No. 9000 1-1/4" cast brass "P" trap with cleanout; stops and risers per “Specialties” in this specification section.

Faucet: Sloan Optima Model ETF-600 infrared sensor, 8" centers, 0.35 GPM flow, with 115 volt/ 1 phase hardwired power.

Cover: TrueBro Model Series 2018 ADA-compliant, high-impact UV-protected vinyl cover, custom factory pre-cut to fit lavatory.

P-3B Lavatory Wall Hung – ADA:

Lavatory: Existing Kohler wall-hung lavatory. Contractor shall field verify model number for compatibility with new faucet.

Plumbing Brass: Existing except for stops and risers per “Specialties” Section.

Faucet: Sloan Optima Model SF-2300 infrared sensor, 4" centers, 0.35 GPM flow, with 115 volt/ 1 phase hardwired power. Provide with thermostatic mixing valve.

Cover: TrueBro Model Series 2018 ADA-compliant, high-impact UV-protected vinyl cover, custom factory pre-cut to fit lavatory.

D . Sinks:

P-5A Sink:

Sink: Elkay No. LRAD 3319, dual compartment ADA, multi-hole drill, 18 gauge, type 304, stainless steel, 19" front to back x 33" left to right x 6-1/2" deep self-rimming sink with rear faucet ledge.

Plumbing Brass: Elkay stainless steel cup strainer with 1-1/2" tailpiece and 1-1/2" cast brass "P" trap; stops and risers per “Specialties” in this specifications section.

Faucet: Chicago Faucet No. 1100-HA8XKABCP top mount sink faucet on 8" centers, with No. 1000 handles, ceramic cartridges, No. HA8 swing spout, and 0.5 gpm aerator.

P-5B Sink:

Sink: Just Manufacturing or Advanced Tabco custom 16 gauge all stainless construction Steel Sink with integrated table and lower shelf. Overall length shall be 96" long x 30" deep x 34" high

Plumbing Brass: Elkay stainless steel cup strainers with 1-1/2" tailpieces and 1-1/2" cast brass “P” trap with cleanout; stops and risers per “Specialties” in this specifications section.

Faucet: Chicago Faucet No. 1100-HA8XKABCP top mount sink faucet on 8" centers, with No. 1000 handles, ceramic cartridges, No. HA8 swing spout, and 0.5 gpm aerator. Provide with vacuum breaker.

E . Service Sinks:

P-6A Service Sink - Floor Mount:

Sink: Swan No. MS-2424 molded fiberglass sink basin, 24" x 24" x 10" high, color white, with minimum 30" long heavy duty reinforced 5/8" diameter flexible hose for connection to 3/4" hose thread, spring loaded stainless steel hose bracket, vinyl rim guards.

Plumbing Brass: Combination dome strainer and lint bucket of minimum 16 gauge 302 stainless steel, with stainless steel screws and 3" drain connection.

Faucet: Chicago Faucet No. 897-RCF combination service sink fitting with 3/4" hose thread on spout, No. 369 handles, wall brace, pail hook, No. R-1/2" flanged female adjustable arms, integral stops, ceramic cartridges, polished chrome-plated.

P-6B Service Sink - Wall Hung:

Sink: Kohler "Bannon" No. K-6714 with wall hanger, acid enamel finish, manufacturer's stainless steel rim guards, outlet strainer, and adjustable cast iron trap.

Faucet: Chicago Faucet No. 897XP-CCP combination service sink fitting with 3/4" hose thread on spout, No. 369 handles, wall brace, pail hook, No. R-1/2" flanged female adjustable arms, integral stops, ceramic cartridges, polished chrome-plated.

F . Floor Drains:

P-11A Floor Drain:

J.R. Smith No. 2010-A cast iron body floor drain, with nickel bronze adjustable strainer head, round nickel bronze grate, vandal proof screws, reversible flashing collar, and trap primer connection. Provide with wide flange round strainer, minimum 4-inches wide and 3/16-inch thick where drain is used with waterproof membranes installed on top of the floor; J.R. Smith DX2010-A. Size drain outlet to match pipe size shown on drawings.

G . Water Fittings:

P-12A Valve Box:

Guy Gray Model BIM875 stainless steel rough-in box with angle valve (1/2-inch inlet, 1/4-inch compression outlet).

H. Urinals:

P-2A Urinal - Wall Hung - ADA:

Urinal: Kohler "Bardon" No. K-4991-ET vitreous china, wall hung, with 3/4" top inlet spud wall hangers, and 0.125 gallon flush, and strainer.

Flush Valve: Sloan "Optima" 186 ES-S-0.125.

2.3 OFF-THE-FLOOR FIXTURE SUPPORTS (CARRIERS)

- A. General: Type to suit fixture and building construction, with added anchors, bracing, wall backing and accessories to comply with maximum specified fixture movement. Concealed in wall. Provide with all hardware and accessories for proper fixture support to suit the application. See Section 20 05 29 for hangers and supports.
- B. Water Closets: Cast iron or steel construction, adjustable to support fixture, with positive sealing gasket fabricated of closed cell neoprene. Shall be capable of supporting 700 lb load test per ANSI A112.19.2; Provide with rear anchoring lug on single units to comply. J.R. Smith 100, 200 and 300 series with added anchors and accessories to comply with maximum specified fixture movement.
- C. Lavatories: Steel construction, with 1-inch x 3-inch rectangular steel uprights welded to 4-inch square steel base plates for floor anchoring, and arms for lavatory support. J.R. Smith Figure 700 and 710 with added anchors, bracing, wall backing and accessories to comply with maximum specified fixture movement.
- D. Other Fixtures: Manufacturers' standard carrier to suite fixture and application, steel construction with anchors, bracing, wall backing and accessories to comply with maximum specified fixture movement.
- E. Non-Standard Fixtures: For fixtures that standard carriers are not manufactured for provide 3/16" thick steel back plate for block walls and wood stud walls; or a 2" x 2" x 1/4" angle welded to at least four studs for metal stud walls, with through bolts and fasteners to support fixture and comply with maximum specified fixture movement.

2.4 SPECIALTIES

- A. General: Unless indicated otherwise, the following fittings and materials (i.e. specialties) shall be used.
- B. Fixture Traps: 17 gage seamless chrome plated cast brass tubing, with 2 inch minimum seal, cast brass slip nuts, size as required by Uniform Plumbing Code (unless a larger size is indicated), and configured to suit the application. Provide with cleanout where indicated or required by code.
- C. Exposed Piping and Fittings: In finished areas and in accessible cabinets, provide piping with chrome plating or sleeved with chromed sleeves or of stainless steel construction/finish; all chrome to have a bright polished finish. No exposed copper allowed (includes accessible cabinet areas).
- D. Stops: Quarter turn ball valve type, chrome plated, UPC compliant, with low lead brass body, rated for minimum 125 psi operating pressure and temperature of water used with plus 20 deg F. Size and configuration to suit application. Provide with loose key where installed in areas with public access.
- E. Risers: Flexible braided steel type; rated for 125 psig.
- F. Escutcheons: See Section 20 05 19.
- G. Refrigerator Valve Box: 20 gauge hot dipped galvanized steel box with 18 gauge face plate, 1/2" inlet x 1/4" outlet compression angle valve. Guy Gray Model BIM875.

- H. Hot Water Temperature Limiting Valve: Thermostatic water temperature mixing valve with integral checks, complying with ASSE 1070 and UPC Chapter 4. Brass body with brass and stainless steel internal components. Leonard “ECO-Mix” 270 or Symmons “Maxline” Model 5-210.
- I. Sealant: See Section 20 05 30. Sealant at fixtures shall be the silicone type, color to match fixture.

PART 3 - EXECUTION

3.1 INSTALLATION OF FIXTURES

- A. General: All fixtures shall be completely connected to piping as needed to make a complete and operable installation.
- B. Fixture Locations: Mounting heights and locations of fixtures shall be as shown on the Architectural drawings and in accordance with Contract Document requirements. Locations shall be verified and coordinated with the various trades affected by the installation of these fixtures. When none indicated or shown, obtain mounting location and heights from the Architect/Engineer prior to installation. Floor drains shall be installed in proper locations and coordinated with floor slopes so that drains are set at low points to allow for floor drainage. Floor receptors (or floor sinks) shall be set flush with floors to allow drains to serve as both indirect drain receptors and as floor drains (unless noted otherwise or required to be elevated by code).
- C. Rough-In: Determine rough-in location of fixture utilities to suit fixture location, fixture dimensions, elements of construction (i.e. beams, studs, electrical, ducts, etc.), access requirements, casework dimensions, items which may drain/connect to fixture, use of fixture, and related considerations. The fixture rough-in locations indicated on the plans is schematic, and is not to be used for final rough-in purposes. Coordinate fixture locations with other systems so that either conflicting items are relocated or fixture locations are adjusted to suit.
- D. Offsets: Provide offsets in piping to fixtures to accommodate building systems. Such offsets shall include off-setting waste piping into cabinet bases (in kick space where possible) to accommodate beams located directly below walls behind fixtures.
- E. Carriers: All off-the-floor (i.e. wall) mounted fixtures shall be installed with supporting carriers and additional anchors, bracing and supports to transmit fixture loads to the floor and building structure without exceeding the maximum specified fixture movement. Prior to concealing carrier and associated supports review adequacy of support system with Architect/Engineer.
- F. Fixture Sealant: Where fixtures abut to walls, floors, and cabinets seal all joints with a uniform fillet bead of sealant. Provide at other locations as recommended by fixture manufacturer.
- G. Protection: Protect fixtures against use and damage until project substantial completion; provide guards and/or boxing to protect.
- H. Water Closet Lavatory Transformers: Provide low voltage wiring from transformer to sensor flush valve / faucet. See plan for transformer locations.

3.2 INSTALLATION OF SPECIALTIES

- A . Escutcheons: Provide escutcheons at each point where an exposed pipe or other fitting passes through walls, floors, backs of cabinets, or ceilings.
- B . Stops: Provide stops in water connections to all fixtures/equipment, except where a stop valve is integral to the fixture (e.g. flush valves) and in water connections to all items not served by another valve.
- C . Hot Water Temperature Limiting Valve: Install on all lavatories, hand wash sinks, bathtubs, showers, whirlpools, bidets and at fixtures required by Code (reference UPC Chapter 4); set for 115 deg F maximum delivery temperature. Test and adjust for proper operation and submit written report documenting work performed.

3.3 ADJUSTMENT AND CLEANING

- A . Cleaning: After completion of installation remove all labels and thoroughly clean all fixtures, trim and fittings.
- B . Adjustment: Adjust all flush valves, fixture stops, faucets, valves, and associated plumbing items as necessary for the proper operation of all fixtures and equipment.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A . Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 00 and Division 01 Specification Sections, apply to this Section.
- B . Requirements of Section 20 05 00 apply to this Section.

1.2 WORK INCLUDED

- A . Variable-Air-Volume Terminal (VAV) Air Terminal Units.
- B . Air Terminal Unit Adjustment.

1.3 SUBMITTALS

- A . General: Comply with Section 20 05 00.
- B . Product Data: Submit product information on all products being provided.
- C . Operation and Maintenance: Submit Operation and Maintenance data and submittal data for inclusion in project O&M Manuals.

1.4 REFERENCES

- A . AHRI 410: Forced-Circulation Air-Cooling and Air-Heating Coils.
- B . AHRI 880: Performance Rating of Air Terminals.
- C . ASHRAE 52.2: Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size.
- D . UL 181: Air Ducts, Air Connectors, and Closure Systems.
- E . UL 1995: Heating and Cooling Equipment.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A . Products shall comply with Section 20 05 00, 2.01, Acceptable manufacturers.
- B . Air Terminal Units: Titus, Carnes, Enviro-Tec, Price, Nailor, Krueger, Trane.

2.2 SHUT-OFF VAV AIR TERMINAL UNITS

- A . Type: Variable-Air-Volume, shut-off and shut-off reheat.
- B . Capacities: As indicated on plans, rated in accordance with AHRI Standards.
- C . Certification: Terminal units shall be certified under AHRI 880.

- D. Complete Assembly and Listing: Unit shall be factory tested as a single unit. Unit shall ship as a complete assembly requiring no field assembly (including accessories). All electrical components shall be UL listed and installed in accordance with UL 1995. Electrical connection shall be single point. All electrical components, including low voltage controls, shall be mounted in a NEMA 1 enclosure. The entire terminal shall be ETL or UL listed as a complete assembly.
- E. Casing: Shall be constructed of minimum 22 gauge galvanized steel, internally lined with glass fiber insulation complying with UL 181. All exposed insulation edges shall be coated with a liner sealant to prevent entrainment of fibers in the airstream. The terminal shall have a round duct collar for the primary air connection and a rectangular discharge suitable for flanged or slip drive duct connection. The casing shall be designed for hanging by sheetmetal straps or by hanger rods (one method or the other).
- F. Primary Air Damper: The primary air damper assembly shall be heavy gauge steel with solid shaft rotating in Delrin or bronze oilite self-lubricating bearings. Damper leakage shall not exceed 5% of the manufacturer's scheduled fan capacity at 1" w.g. inlet static pressure. Shaft shall be clearly and permanently marked on the end to indicate damper position. The damper shall incorporate a mechanical stop to prevent over-stroking and a synthetic seal to limit close-off leakage to the maximum values shown below.

| Inlet Size | Maximum Damper Leakage, cfm | | |
|------------|-----------------------------|---------|---------|
| | 1.5" SP | 3.0" SP | 6.0" SP |
| 6 | 4 | 5 | 7 |
| 8 | 4 | 5 | 7 |
| 10 | 4 | 5 | 7 |
| 12 | 4 | 5 | 7 |
| 14 | 4 | 6 | 8 |
| 16 | 5 | 7 | 9 |

- G. Airflow Sensor: Total pressure sensing flow ring with four average pressure points and static pressure point for measuring unit inlet velocity pressure to allow for pressure independent operation. Provide with tubing extended to point of connection to Division 25 controls.
- H. Sound Performance: Equivalent to manufacturer's model scheduled on the plans.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install items in accordance with manufacturers instructions, code requirements and applicable standards.
- B. Access: Verify access and clearance requirements before ordering and again before installing. Order with correct access orientation. Maintain code required clearances and maintenance access requirements.
- C. Air Terminal Units Inlets: Provide minimum length of straight duct to air terminal unit inlet as indicated on the plans; but no less than two feet.
- D. Transitions: Provide duct transitions as required to transition from items to duct sizes shown on plans. Transitions shall be lined. Where the connecting duct is indicated to be lined.

- E . Filters: Provide one extra set of filters of each type/size required for air terminal units.
- F . Adjustments: Adjust air terminal units to provide air flow quantities indicated; coordinate settings with Balancer and Division 25.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A . Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 00 and Division 01 Specification Sections, apply to this Section.
- B . Requirements of Section 20 05 00 apply to this Section.

1.2 SECTION INCLUDES

- A . Control System Design.
- B . Complete Mechanical System Controls.
- C . Control Devices, Components, and Wiring.
- D . Control System Commissioning.

1.3 SUBMITTALS

- A . General: Comply with Section 20 05 00.
- B . Product Data: Submit manufacturer's product data for all items to be used. Provide a complete materials list, labeled to match labeling used on shop drawing, with manufacturer and model number. Clearly indicate specific each item's control features (e.g. range of operation, accuracy, electrical characteristics, material of construction, etc.). Provide a schedule listing all control valves, control dampers, sizes, flow rates, pressure drops, Cv's, and related data to clearly identify application.
- C . Shop Drawings: Submit shop drawings of complete control system, including the following information: interconnect drawings showing all wiring and control connections, all control device locations, sequence of operation for all controlled systems, building floor plans with all proposed thermostat and other control device locations shown.
- D . Labeling: Submit list of proposed component labeling.
- E . Commissioning Reports: Submit documentation showing commissioning work and results.

1.4 QUALITY ASSURANCE

- A . Listing: All network controllers, central system controllers and local user displays shall be UL Listed under Standard UL 916, category PAZX.
- B . Electrical Interference: All electronic equipment shall conform to the requirements of FCC 15, governing radio frequency electromagnetic interference and be so labeled.
- C . Skilled Workers: The entire control system shall be installed by skilled electricians, technicians, and programmers, all of whom are experienced, properly trained and qualified for the work they perform. Contractor shall submit evidence of workers' experience and training upon request of the Engineer.

- D. Communications Cabling: Comply with ANSI/TIA 568 series of standards, ANSI/TIA 569, 606, and 607.

1.5 GENERAL REQUIREMENTS

- A. Single Contractor: One single Company shall be responsible to design, furnish and install the complete Division 25 control system. Any subcontracted installation work shall be done by firms experienced and qualified in the work they perform, and subject to approval by the Engineer.
- B. Bidder Design: The control system is bidder design, subject to the requirements of the Contract Documents.
- C. Local Contractor: The Division 25 work (i.e. all control system design, programming, commissioning, and all required work) shall be done by local office personnel, with their office facilities, located within 100 miles of the project location.
- D. Qualifications: Firms performing the Division 25 work shall meet the qualifications listed below. Firms listed below have been pre-qualified as a convenience to bidders.
 - 1. Have installed control systems of the type required for this project in at least 6 projects of similar or greater complexity in the last 2 years. These similar or more complex projects shall involve integrating controls of another contractor.
 - 2. Be qualified by the manufacturer of the system being installed to install the type of controls and of the magnitude required for this project. Such pre-qualifications shall include titles as "Authorized Control Integrator", "Independent Field Office", "Authorized Factory Representative" or similar.
 - 3. Have installed control systems similar to the type for this project in at least 6 projects in a campus setting where the work could affect the control systems in multiple buildings.
 - 4. Pre-qualified firms: Sound Energy, ATS Automation, Delta Controls, local branch office of listed control system manufacturers (see Paragraph 2.01 this Section).
- E. Licensing: Provide licensing which allows the Owner to make modifications, additions, expansion, and interconnections to all aspects of the system without limitation. Manufacturer's software licensing agreements shall be configured to allow the system to be "open" and non-proprietary. The Owner shall have full ownership for the system and access.
- F. Payments: The Contractor is advised that in addition to payments held out for retainage and project final completion (i.e. punchlist work) as specified elsewhere, the work of this specification Section may be limited to a maximum payment of 90% of the scheduled value of the work until all system are proven operational and have been properly checked out by the installing Contractor.
- G. All DDC Control: All controls and sequences shall be provided by the Division 25 DDC control system, unless specifically noted otherwise. Where interval timer, switch control, or a similar manual control is indicated, the control device shall provide an input to the DDC system with the DDC system providing an output for control. No line voltage controls or other controls which do not "pass through" the DDC control system are allowed, unless directly stated that is the method of control to be used; see the Control Sequences Specification Section for exceptions.

- H. Service Allowance: Include 16 hours of control labor for special work (i.e. software changes, system consultation, relocation of control devices and other services) during construction as required by the Owner or Engineer. The Engineer and Contractor will jointly track the amount of time used. Only time directly authorized and agreed to by the Engineer may be tracked as part of this allowance. This allowance is for work outside of other required project work, and is for specific tasks assigned to the Contractor by the Owner or Engineer.
- I. Existing Systems:
1. Existing Controls: Existing controls are the DDC type, by Alerton installed by ATS Automation. New controls shall be the DDC type and shall be an extension of the existing system, by the same manufacturer, with the same capabilities extended to include new equipment. Revise and add system graphics to reflect all project work and to include new equipment. **The existing building controller (Alerton BCM) is to be used for the project.**
 - ~~2. Existing Controls: Existing controls are the DDC type, using a combination of Distech and Invensys controls. New controls shall be the DDC type and shall be a modification and extension of this existing system. Revise and add system graphics to reflect all project work and to include new equipment; replace system components and wiring as required to provide the specified sequence of operation.~~
 3. Field Verification: See Section 20 05 00 and 20 05 03 for additional field verification requirements. Verify existing system detail; including but not limited to existing electrical wiring, existing equipment, existing components (types and locations), existing starter type/locations, graphics to interface with, existing programming, and related information in order to allow the Work to be compatible with the existing.
 4. System Demolition and Revisions: Remove existing controls at demolished equipment and revise system as necessary so that existing items that remain continue to operate properly. Revise existing system graphics to reflect demolished system revisions. Revise existing control wiring and control components as necessary to properly reconnect to all relocated and revised equipment so that the equipment operates properly. Revise and relocate existing wiring and control component locations to suit revised area.
 5. Wiring and Component Reuse: Verify existing system wiring and existing components to be reused, to confirm they will operate properly with the new system. Existing components that are indicated to be reused shall be assumed to be in working condition (i.e. temperature sensors, actuators, etc.); however, Contractor shall review their operation and functionality to confirm their condition and notify the Owner of any issues or component failure.
- J. Spare Parts: Contractor shall furnish the Owner with minimum of the following spare parts, of same type as used in this project:
1. Two spare VAV box terminal control unit.
 2. Two room temperature sensors/thermostats with occupancy override.
 3. **Turn over all the existing VAV controllers on VAV boxes to be demo'd as spare parts to the Owner.**
- K. Warranty:
1. Basic: System shall be warranted to provide the sequence of operation and basic features specified, with the accuracy and flexibility specified. The system shall be

repaired or replaced, including materials and labor, if in Owner's reasonable opinion, system is other than as warranted.

2. Emergency Service: During the warranty period maintain a 24 hour emergency phone service and be able to respond by a trained and qualified Controls Engineer familiar with the installed system. The Contractor shall be able to communicate with the system for purposes such as program algorithm alterations, operational evaluations, trouble-shooting, etc.; said response shall be within six hours, with site visits (as necessary) in no less than two weekdays.
3. Warranty Service Allowance: Include 16 hours of control technician/programmer's time for special service (i.e. software changes, system consultation, setting up additional trends, etc.) and other services during the warranty period as required by the Owner or Engineer. The Owner and Contractor will jointly track the amount of time used. Only time directly authorized and agreed to by the Owner may be tracked as part of this allowance. This allowance is for work outside of other required project work, and is for specific tasks assigned to the Contractor by the Owner or Engineer.
4. End of Warranty Service: At the end of the warranty period, the Contractor shall provide a re-check of the entire system operation, including calibration testing of a sample number of components and providing any necessary control adjustments for proper system operation. Such work shall be for a minimum of 8 hours on site.

1.6 REFERENCES

- A . UL 916: Energy Management Equipment.
- B . FCC 15: Code of Federal Regulations, Title 47, Part 15, Federal Communications Commission Regulations.
- C . AMCA 500-D: Laboratory Methods of Testing Dampers for Ratings.
- D . ANSI/ASHRAE 15: Safety Standard for Refrigeration Systems and Designation and Classification of Refrigerants. ANSI/TIA-568.0-D General Telecommunications Cabling for Customer Premises
- E . ANSI/TIA 568.1-D: Commercial Building Telecommunications Infrastructure Standard
- F . ANSI/TIA 568.C.2: Balanced Twisted Pair Telecommunications Cabling and Components Standard
- G . ANSI/TIA 569-D: Telecommunications Pathways and Spaces
- H . ANSI/TIA 606-C: Administration Standard for Telecommunications Infrastructure
- I . ANSI/TIA 607-C: Generic Telecommunications Bonding and Grounding for Customer Premises

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. General: Products shall comply with Section 20 05 00. See Section 20 05 00, paragraph 2.01 for Acceptable Manufacturer requirements.
- B. Control System Manufacturer: Alerton.
- C. Actuators: Belimo.
- ~~D. Control Valves: Honeywell, Armstrong, Belimo, Siemens, TA Hydronics.~~
- ~~E. Control Dampers: Ruskin, American Warming and Ventilating, Greenheck.~~
- F. Variable Frequency Drives (VFD's): ABB, Danfoss-Graham.
- G. Carbon Dioxide Sensors: Vulcan, Vaisla, Honeywell.
- H. Other Control Components and Accessories: Idec, Hoffman, McDonnell, Tridelta, Veris, Kele, Edwards, Mamac, APC, Barksdale, Mark-Time, Functional Devices, and manufacturers listed for microprocessor based products.

2.2 BASIC SYSTEM

- A. General: The system shall be a distributed processing type direct digital control (DDC) system. System shall provide complete stand-alone temperature control/monitoring and energy management for this project, using a network of various independent controllers, sensors and associated devices interconnected in a communicating network.
- B. System Protocol: System shall utilize an open (i.e. non-proprietary) communications protocol which allows the use of control components by different manufacturers to be installed as part of the system with automatic adaption and incorporation into the system with minimal programming. System shall be a BACnet compliant type with all component communication using the protocols and standards as defined by ANSI/ASHRAE 135. LAN type shall be Contractor selected (complying with Contract Document requirements). System shall be internet accessible using standard web browsers such as Windows Explorer and be based on Tridium "Niagara AX" software utilizing JACE controllers (or other as approved by the Engineer).
- C. Version: System shall be latest version of the manufacturer's standard commercial building DDC system.
- D. Expansion: System shall have a fully modular architecture, allowing expansion through the addition of controllers, and control devices. System shall have capability to increase capacity by 100% (i.e. as many points as system currently has) without requiring software upgrades or revised licensing.
- E. Network: All controllers shall be interconnected in a communicating network to provide facility wide access to work stations and sharing of information. A Local Area Network (LAN) shall be provided to interconnect controllers for high speed data transmission. Failure of a single or multiple controllers shall not cause loss of communication between other LAN-connected controllers still active. The control system LAN shall be separate and

independent from other building LAN's (except for a single data terminal connection at a single system workstation).

F. Supports:

1. Electrical Components: Provide supports for items governed by the NEC and low voltage control components in accordance with the NEC, local amendments to the NEC, and Division 26. Cable supports shall use extra wide base J hooks, with plenum rated tie wraps. Staples, straps, bridle rings, and similar supports are prohibited.
2. Non-Electrical Components: See Divisions 20, 22, and 23.

2.3 SYSTEM FEATURES

- A. General: Controllers, operator workstation, control components, and accessories shall all be combined to form a complete system providing the sequences of operation/functions specified and having the features specified. System shall monitor and control all functions relating to building environment, utilities, energy usage, and mechanical systems operation. The point monitoring and controlling functions to be performed by the system shall include but not limited to the following capabilities:
1. Digital inputs (e.g. a contact closure of a control device).
 2. Analog inputs (varying electrical signal from a control device to a controller).
 3. Digital output (e.g. a contact closure by a controller).
 4. Analog outputs (varying electrical signal from a controller to a control device).
 5. PWM (pulse width modulation) with feedback position indication.
- B. Controllers: The system controllers shall directly control all valves, fans, HVAC equipment, dampers, coils, system equipment, and similar devices. All control software shall be implemented in the controllers.
- C. Controller Failure: Upon failure of any controller system shall display off-line occurrence for each individual affected point. Provide communication verification to each NAC for each I/O channel. If communication is disrupted, show error count for each attempt to communicate for each registered point per NAC. Operator shall be able to update count and reset to zero.
- D. Zone Control: Provide zone-by-zone control of space temperature, usage scheduling, equipment status reporting, and override timers for off-hours usage.
- E. Setpoints: Zone temperature setpoints, equipment setpoints, pressure setpoints and all other controlled parameters shall be able to be set by an operator (except where indicated otherwise). System shall have global command ability to override all settings of the same type to the same value. All setpoints shall be operator adjustable (via common English language commands).
- F. Password and Security: Access to system shall be by priority password security system to prevent unauthorized use. Minimum of five levels, each assignable to dedicated function keys. Invalid passwords shall lock data base access after three attempts. Password shall not be needed for access to monitoring programs. Operator may select individual security level assignments for each operation and menu selection available.

- G. Time Control: System shall have capability for each equipment to have its own independent time schedule; including occupied/unoccupied modes and optimum start cycles. In addition, system shall have capability for each equipment that could be operated on a seasonal basis (e.g. boiler in heating season, chiller in cooling season, associated pumps, de-stratification fans, baseboard heaters, AC units, etc.) to have independent time of year seasonal schedules.
- H. Auto-Restart: System shall start automatically on power failure, with a sequence to prevent excessive electrical demand due to all equipment starting at the same time, or undesirable affects due to improper sequencing of equipment. Provide staggered start times for all equipment to prevent more than 10 kW of electrical load from starting at the same time (except where not possible due to individual equipment size exceeding this size). Provide a two minute delay (adjustable) between loads (or as required to allow for a proper re-start).
- I. Time Schedule Override: Bypass devices shall send signal to control system indicating requirement for time schedule override operation. The operator shall program the time of override operation at the keyboard from 1 to 15 hours; set initially for 2 hours. Override time remaining to be displayed as part of system graphics; and operator shall be able to alter override time or turn area back to automatic.
- J. Run Time: Equipment run time totalization and start/stop totalization of all equipment connected to system; may be trended totalization information, with no required auxiliary equipment.
- K. Menu Modification: Operator shall have complete capability to modify displays, menus and menu format headings, data base information, with no required auxiliary equipment.
- L. Energy Usage:
 - 1. Peak Demand Recording: The building's electrical demand shall be measured; demand peak in kW and its date and time of occurrence shall be recorded. These values shall be observable by an operator. Provide a KW-hour trend log. Provide demand reading program that matches method and time base used by local utility company to bill for demand so that control system demand readings match the utility readings.
 - 2. Power Recording: Measure building's electrical energy usage; current annual, monthly and daily total building electrical power usage shall be recorded. Provide a KWH trend log.
- M. Clock: Real-time clock shall be self-contained and accurately controlled by a quartz crystal. The clock shall be set via the keyboard and may be viewed on the display. A battery standby power supply shall be used to maintain clock operation when primary power fails. When primary power returns, the system shall automatically restart to the appropriate schedules with accurate clock time and require no action from personnel to re-initialize.
- N. Disk System:
 - 1. System shall be able to store data base on standard digital disk or load data base from the disk. Operator to be able to program system to automatically dump data base to disk storage system at end of each day for the purpose of updating all point data information and logs.
 - 2. The disk system shall be activated to load or store data to the system controllers on system initialization or as permanent changes as recorded. Disk system shall not be utilized for routine system operation.

O . Alarms:

1. For each analog input point allow operator assignable high and low alarm limits; for each digital input point allow operator assignable alarm.

P . Logs:

1. Trend Log: Provide trends for all input and output data and the ability to log the data. For each trend log, operator may assign multiple points and an interval sampling rate of 1 minute to 96 hours. Store time segments. Provide for review of data on graphic display and printer. Each trend log shall be able to be assigned individual start/stop times/dates in advance. System shall automatically begin entry into each log as scheduled. Each point in the log shall have 360 entries, all data stored for future retrieval. Trends shall be formatted for ease of reading.
2. Current Alarm Log: An alarm log shall track and display all points currently in alarm.
3. Alarm History Log: Log last 100 alarms as to time of occurrence, time of acknowledgment and time of return to normal. Maintenance alarms shall be separate from operational type alarms.

Q . Scheduling:

1. Time Schedules: The Control System shall provide time clock schedule with at least 100 time schedules. Each schedule to be 8-day type, 6 entries per day. All entries to be in 12 hour AM/PM format. The complete schedule shall be displayed at one time on the operator workstation for easy editing. Each time program shall be able to include on/off, high/low speed or duty cycle commands, or Analog Control Values as applicable for the application. Equipment may be assigned to named schedules, with master revisions to the schedule revising all assigned equipment.
2. Holiday Schedules: A minimum of 24 holiday time schedules shall be available and shall be assigned to any number of available points.
3. Holiday schedule shall display entire year and shall also allow for an interval holiday time, program showing holiday start date to end date (example: December 24 to January 2).
4. Schedules shall provide control of all equipment as indicated in the sequence of operation. Coordinate with Owner for final project schedules.

R . Demand Limiting: Provide a demand limiting program with a hierarchy of equipment loads to be shed. System shall support at least 100 loads and three demand meters.

S . Warm-up Mode: Control System shall have warm-up mode prior to occupied mode on heating to pre-warm building prior to occupancy. Time of beginning warm-up cycle shall be determined by an optimum start/stop program.

T . Optimum Start/Stop: Control System shall have optimum start/stop program to reduce run time of HVAC equipment. Optimum start/stop program shall consider building mass, building temperatures, outdoor air temperatures, and other system factors in determining time of system start-up or shut-down. Program shall record previous warm-up times versus actual warm-up times and shall adjust the program algorithm so that program calculated warm-up time corresponds to actual.

U . System Graphics:

1. Graphics: Provide complete system color graphics with displays of all controlled systems. Graphics shall allow operator capability of constructing additional floor plan drawings, mechanical equipment diagrams, piping diagrams, and similar systems drawings at will, while system is on line. Graphics to be color dynamic, displaying current monitored system values. Graphics shall be menu driven from keyboard keys and from mouse. System shall use English language and acronyms selected to allow operators to use the system without extensive training or without programming backgrounds. Software shall use command strings in a request-response sequence in which the machine prompts the operator for all required information; operator response required shall be the appropriate parameter input data. Software shall contain edit functions and escape modes to eliminate continuous logic loops requiring system reboot to escape. Coordinate with Owners staff to develop all operational data to satisfaction of Owner.

V . All percentage values on actuators shall indicate percentage open.

W . Provide adjustable date and time stamp on main graphics page.

X . Provide link on main graphics page navigating to pdf files (or equivalent) files showing sequences of operation and as-built drawings.

2.4 CONTROLLERS

- A . General: Shall be manufacturer's standard controllers used for commercial DDC systems complying with the system communication protocol specified and allowing the system to provide the specified features and sequence of operation. Controllers shall be listed, certified, or in some definitive way deemed compliant by an appropriate independent agency that they comply with the system communication protocol being utilized.
- B . Types: Type, capacities, arrangement and features shall be Contractor selected to provide an overall system complying with Contract Document requirements.
- C . Operating Conditions: Controllers shall be capable of operation over a temperature range of 32 deg F to 130 deg F and a humidity range of 5% to 95% (non-condensing).
- D . Network Area Controller (NAC): Shall be modular, multi-tasking, microprocessor based direct digital controller, capable of forming a complete interconnected/communications. Shall provide the interface between the LAN and the field control devices, and provide global supervisory control functions over the control devices connected to the NAC. It shall be capable of executing application control programs to provide:
 1. Calendar functions.
 2. Scheduling.
 3. Trending.
 4. Alarm monitoring and routing.
 5. Time synchronization.
 6. Network management functions for control devices.
 7. The NAC must provide all hardware features and accessories as necessary, including ethernet port and battery backup, to provide a complete and operational control system.

8. Provide with flash memory for long term data backup (if battery backup or flash memory is not supplied, the controller must contain a hard disk with at least 1 gigabyte storage capacity).
 9. The NAC shall support a standard Web browser access via the Intranet/Internet and provide multiple user access.
 10. Controller mounted display with LCD screen with user friendly menu for system access.
- E. Terminal Unit Controllers (TUC's): Controller specifically designed for control of individual air handling units, fans, VAV terminal units, and similar type units; controllers shall be microprocessor based and shall contain a non-volatile resident program to allow for proper sequencing of controlled equipment. TUC shall interface to the building control system a multi-drop communications network. An individual controller shall be provided for each piece of unique equipment. Each terminal controller shall be accessible for purposes of control and monitoring from a central or remote operator's terminal as specified herein.

2.5 TEMPERATURE SENSORS

- A. Room Temperature Sensors: Solid state electronic type, employing a resistance type output. Factory calibrated to an accuracy of plus/minus 0.5 deg F with a temperature range of 32 to 130 deg F in normally occupied areas and -40 to 140 deg F in other areas, with the following features:
1. Space temperature display.
 2. Momentary push button for placing room's system into occupied mode when pressed.
 3. Means for adjusting temperature setpoint up or down with setpoint display.
- B. Room Temperature Sensor Guards: Lockable, slotted, clear plastic type.
- C. Duct Temperature Sensor: Shall be solid state electronic type, employing a resistance type output. Factory calibrated accuracy of plus/minus 0.5 deg F with a temperature range shall be -40 to 160 deg F. The sensor shall include a utility box and gasket to prevent air leakage and vibration noise. For all mixed air and preheat air applications, install bendable averaging duct sensors with a minimum 5 foot long sensor element installed so as to sense a representative sample of the medium being controlled.
- D. Outside Air Temperature Sensor: Solid state electronic type device, for outdoor installation, factory calibrated accuracy of plus/minus 0.5 deg F, with a temperature range of -20 to 180 degrees F. Provide a sun shield and weatherproof assembly.

2.6 CONTROL DAMPERS

- A. Type: Low leakage control dampers, parallel blade or opposed blade type as selected by Division 25 contractor to best suit application (unless a specific type is indicated).
- B. Leakage: Class 1A leakage rated in accordance with AMCA 500-D.
- C. Construction: Construct of galvanized steel, except where installed in ducts of stainless steel or aluminum construction or handling corrosive air, shall be of stainless steel or aluminum construction (to match duct material) or have corrosion resistant coating. All materials in contact with the airstream shall be suitable for the conditions without deterioration. Frame shall be minimum 16 gauge with reinforced corners.

- D. Blades: One-piece airfoil shape, minimum 16 gauge, with neoprene, extruded vinyl or butyl rubber edge seals and flexible metal jamb seals; linkage interconnecting all blades and actuator axle. Blades width shall not exceed 6 inches, and shall be smaller width where a smaller blade best suit the application (i.e. provides improved airflow or smaller frame size).
- E. Bearings: Nylon, molded synthetic, or oil impregnated sintered metal bearings (or other materials as conditions require).
- F. Special Configurations: Provide with configuration and accessories to suit specific application and installation requirements. Where install in walls behind grilles, provide for use with direct coupled actuator (with actuator residing in the damper frame) and reduced size damper (to allow for actuators) that protrude past damper frame, with blank-off (and installation) to prevent bypass of air (or heat) around damper.

2.7 ACTUATORS

- A. General: Actuators shall use a brushless DC motor controlled by a microprocessor with protection from overload at all angles of rotation. Run time shall be constant, independent of torque. Actuator shall have manual positioning mechanism and direction of rotation control switch and visual position indicator. Housing shall be NEMA rated to suit the conditions at the actuator location.
- B. Type: Proportional or two position or floating point type, as required for application. Proportional type shall modulate in response to a 2-10 VDC, or 4 to 20mA control input. Provide with auxiliary switches as required for sequence of operation and to allow for safe operation of items served (and interlocked items), switches shall meet requirements for "double insulation" so an electrical ground is not required.
- C. Automatic Closure: Actuator shall spring return upon power interruption, spring return position shall be fail-safe as dictated by freeze, fire or temperature protection requirements; except that actuators required to be the fast operating type may utilize a capacitor discharge for fail-safe closure in lieu of spring (subject to Engineer's approval). Spring return is not required for air terminal unit dampers or for zone dampers.
- D. Performance: Actuator power and torque shall be sufficient to match dampers or valves being controlled and allow proper damper and valve operation against system pressures liable to be encountered. Actuator shall be capable of driving control devices from full closed to full open in less than 90 seconds (unless indicated otherwise) and where fast operating type are required (i.e. where interlocked with equipment operation). Where actuators serve valves or dampers directly serving equipment (e.g. boiler water flow control valves) or are interlocked with equipment operation (e.g. make-up air equipment dampers) verify required operating time of actuator with equipment manufacturers and timing of other system components to allow for proper system operation without nuisance shutdowns of equipment or creating undesirable effects due to improper actuator response time.
- E. Accessories: Units shall be complete with all brackets, and hardware required for mounting and to allow for the proper control for the application.

2.8 SWITCHES

- A. Current Monitoring Switches: Electric current sensing device with integral switching contacts. Device shall sense current (amperage) through the conductor the device is applied to and activate switch action (to make and break contacts) once current reaches a

preset value. Device shall be able to be clamped around conductor, and be removable. Switch rating, size, switching current, and type selected by Contractor to suit application and provide the required function. Provide type specifically rated for the motor and load type being applied to.

- B. End Switches: Shall be momentary type limit switches for monitoring the motion of an object at a prescribed arc of rotation or set linear movement. The switch shall be mounted on the exterior of the duct so that the trip lever is aligned with the damper vane. Mechanical adjustments in the switch case shall permit the proper lever action for tripping the mercury switch contacts. The switch shall have a SPDT contact arrangement that exceeds the load requirements for both voltage and current.
- C. Interval Timer - Push Button Type: Momentary contact type illuminated pushbutton with metal operator, amber LED light, and stainless steel cover plate. Sized to suit standard electrical wall junction box. Label as to function.

2.9 CARBON DIOXIDE SENSOR – WALL

- A. Type: Wall mounted non-dispersive infrared (NDIR) type carbon dioxide sensor. Vaisala GMW45 (or approved).
- B. Performance: Measuring range 0 to 2000 ppm CO₂, accuracy plus or minus 3% of reading (including repeatability and calibration uncertainties), non-linearity plus or minus 1% of full scale. Shall have long term stability of 5 years (i.e. no more than 5% of full scale error after 5 year operation).
- C. Housing: ABS molded plastic housing, white, with vent openings.
- D. Output: Shall provide 4 to 20mA, and 0 to 10V outputs, selectable by output jumpers.

2.10 CARBON DIOXIDE SENSOR – DUCT

- A. Type: Duct mounted non-dispersive infrared (NDIR) type carbon dioxide sensor. Vaisala GMD20 (or approved).
- B. Performance: Measuring range 0 to 2000 ppm CO₂, accuracy plus or minus 3% of reading (including repeatability and calibration uncertainties), non-linearity plus or minus 1% of full scale. Shall have long term stability of 5 years (i.e. no more than 5% of full scale error after 5 year operation).
- C. Housing: Plastic housing, with enclosure and accessories for mounting to duct and obtaining sample gas airstream.
- D. Output: Shall provide 4 to 20mA, 0 to 20 mA, and 0 to 10V outputs, selectable by output selection jumpers.
- E. Display: Provide with liquid crystal display showing CO₂ ppm reading.

2.11 ACCESSORIES

- A. Wiring and Conduit:
 - 1. Basic Materials: As specified in Division 26.

2. Power Wiring: 18 AWG minimum and rated for 300 VAC service. Wiring for circuits greater than 24 V shall be as specified in Division 26.
 3. Analog Signal Wiring: Field-installed analog signal wiring shall be 18 AWG single or multiple twisted pair. Each cable shall be 100 percent shielded and have a 20 AWG drain wire. Each wire shall have insulation rated for 300 VAC service. Cables shall have an overall aluminum-polyester or tinned-copper cable-shield tape.
 4. Life Safety Applications: Wiring that performs code required life safety control (e.g. shutdown of equipment), control of engineered smoke systems, fire alarm interface and similar functions shall comply with code and NFPA standards for fire alarm system wiring and the specific application.
- B. Labels:
1. General: Shall comply with Section 20 05 00.
 2. Control Devices: Labels on control devices shall use the same designation that appears on the control shop drawings and an indication as to purpose; except that devices in finished rooms shall be labeled as to the generic item controlled for better user understanding (i.e. "Room Exhaust Fan", "Hood Fan").
 3. Wiring: Wiring labels shall be the self-laminating or heat shrink type with numbering, lettering, or an alpha-numeric identifier indicating the wire signal/power purpose and matching the designation that is used on the control drawings
- C. Control Cabinets: Wall mounted, NEMA rated construction, type and rating to suit location environment, UL listed, minimum 14 gauge sheet metal, hinged front door with latch. Size as required to house controls. Controls/devices shall be logically assembled in cabinet, with all devices and cabinet labeled.
- D. Relays/Contactors: Shall be the single coil electrically operated, mechanically held type. Positive locking shall be obtained without the use of hooks, latches, or semi-permanent magnets. Contacts shall be doubled break silver to silver type protected by arching contact where necessary. Number of contacts and rating shall be selected for the application intended. Operating and release times shall be 100 milliseconds or less. Contactors shall be equipped with coil transient suppression devices to limit transients to 150% of rated coil voltage. Relays shall have mechanical switching to allow manual operation of relay and LED light to indicate the energized state.
- E. Thermowells: Series 300 stainless steel or brass construction, with 2-inch lagging neck and extension type well. Diameter and insertion length to suit application.
- F. Condensate Overflow Switch: Overflow switch to detect high condensate level to stop unit operation and indicate an alarm, low voltage, PVC or ABS construction, with switch rated for voltage/ampereage used with. Style to best suit application (i.e. in drain pan type, in drain line type, or type that installs in unit auxiliary drain outlet); selected by Contractor subject to Engineer review. Little Giant No.s ACS-2, -3, -4, or -5 (or approved equal).
- G. Miscellaneous Sensors/Transmitters/Switches/Transformers: Shall be manufacturer's standard, designed for application in commercial building HVAC control systems, compatible with other components so as to provide sequence of operation specified. Transformers shall have integral circuit breakers with push-button reset.
- H. Gas Sub-Meters: Shall be suitable for pressures and flows to suit application; with accuracy of plus/minus 1% and repeatability of 0.5%; pressure drop at max flow shall be no greater

than 0.5 psi; provide with straightening vanes. Submit shop drawing of proposed locations. Coordinate with Division 22 contractor for installation of monitoring devices.

- I. Tubing: Soft copper tubing, per ASTM B 88.

2.12 ZONE VOLUME DAMPERS (AIR TERMINAL UNITS)

- A. **Air terminal units are specified in section 23 36 00. Provide new terminal unit controller for each unit.**

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Provide complete control system design, all computer software and hardware, operator input/output devices, sensors, relays, switches, dampers, actuators, conduit, tubing, wiring, motor starters, transformers, control cabinets, power panel circuit breakers, and all other components required to provide a complete control system with the system features and sequence of operation specified. Select control components with proper characteristics to suit the application, meet specified system performance, provide specified system features, and provide the specified sequence of operation. Coordinate work with other trades. Review as-builts and field conditions for work involving existing systems or replacements of existing systems. Develop as-builts of existing systems as needed to perform the Work. Perform field reviews prior to developing shop drawings.
- B. Room Sensors: Room sensors (i.e. thermostats) shall be mounted at 48" above finished floor, unless indicated otherwise. Thermostats shall control the equipment which affects the temperature serving the space the thermostat is located in, unless indicated otherwise. Not all room sensors are shown on the drawings and those shown are preliminary only. Contractor shall indicate all final room sensor locations on submittal drawings. Contractor is responsible for coordinating locations to avoid chalkboards, tack boards and other interferences.
- C. Electrical Power and Wiring:
 - 1. General: All work shall comply with code, Division 26 requirements, and ANSI/TIA standards. Run conduit and wiring in neat lines, parallel with building construction and coordinated with other trades. Use wire type and size as required by code and recommended by component manufacturers and to suit the application conditions.
 - 2. Conduit: All wiring shall be installed in conduit and in accordance with Division 26 section of these specifications, except that low voltage wiring within ceiling plenum spaces and in mechanical mezzanine areas may be ran without conduit provided that plenum rated cable is used. Install all conduit and wiring parallel to building lines.
 - 3. Electrical Power:
 - a. Scope: It is the responsibility of the Division 25 Contractor to provide power for all control devices requiring electrical power. Coordinate with the Division 26 Contractor to confirm which panels and circuits are to be utilized. Provide all electrical wiring, conduit, junction boxes, circuit breakers, grounding, panel circuit breakers (of proper size/type), transformers, enclosures and all other components

as needed to power all control devices.in accordance with code and Division 26 requirements.

- b. Sources: Power for control devices shall be obtained from electrical panels and not from power serving the equipment (unless noted otherwise or the Engineer gives approval). Utilize panels located closest to the items served to the greatest extent possible. Where the building has a generator, equipment served by the generator shall also have their control power (i.e. power to control devices which allow the item to be controlled and monitored) shall also be served by the generator (this is in addition to any required UPS').
4. Service Loop: Provide minimum of 6" extra wiring at all wiring terminations for ease of future maintenance/servicing. Such extra wiring shall be neatly coiled/bundled to allow for uncoiling when the connected equipment is serviced.

D . Equipment Interconnect Wiring:

1. General: In addition to control wiring between equipment and control devices (furnished under this Section) to accomplish the specified sequence, provide added control wiring to interconnect equipment components and associated control/safety devices. Provide as required by the equipment manufacturers to allow for proper operation of the equipment and system.
2. Minimal Wiring Required: For bidding purposes, assume a minimum of four wiring connections for each piece of equipment to an adjoining/connecting piece of equipment and/or device(s), and special wire type and special connectors as required by the equipment manufacturer. Coordinate and review all requirements with manufacturers, contractor installing the equipment, and local representatives to confirm scope. Field review existing conditions where controls interface with existing components.
3. Equipment: This work applies to:
 - a. Split system HVAC Equipment: Connect between indoor and outdoor units, and between the indoor unit and its thermostat.

E . Labeling: All control components, except regular room thermostats, shall be labeled. All control wiring shall be labeled except where color coded wiring is used and the control shop drawings clearly identifier wiring for each color and it is fully consistent through-out the entire project. Submit list of proposed labeling prior to installing.

- F . Complete Functions: Provide complete system totally programmed to provide all specified functions, including but not limited to:
1. Time and Holiday Schedules.
 2. Alarm Limits.
 3. Optimum Start of Each Zone.
 4. Dynamic Graphic of Each Distinct Floor Area; include graphic key to allow changes in graphic display.
 5. Dynamic Graphic of Each Mechanical System; include graphic key to allow changes in graphic display.
 6. Summary of All Zone Temperatures.
 7. Summary of Data for Each Zone.
 8. All Displays Specified in Sequence of Operation.

9. Master Menu and Graphics as requested by the Owner.
 10. All Controller Setpoints and Operational Values Required.
 11. Demand Limiting.
 12. Optimum Start/Stop and Warm-up.
- G. Electrical Phase Loss: Provide all necessary wiring, components, software, and accessories to monitor building electrical power quality and 3-phase power; initiate shutdown of 3-phase powered mechanical equipment on loss of a phase.
- H. On/Off Status Indication: All devices which indicate on/off status to GUI, shall have this on/off status manually or automatically controlled from GUI, and shall have positive proof of on or off by differential pressure switch or other applicable device.
- I. OA Sensors: Provide at least one new OA sensors for this project for energizing, with display at the GUI; use average of two for control purposes. Provide logic to allow disuse of "Bad" OA sensor and indicate alarm.
- J. TUC: To simplify controls and mechanical service and trouble-shooting, the TUC shall be mounted inside a waterproof cabinet on the side of rooftop units. This shall allow all controls maintenance and trouble-shooting to be made while at the unit location.
- K. Programming: Provide complete system totally programmed to provide all specified sequences, monitoring data, communications and features.
- L. CO2 Sensors: Duct mounted type, installed in the return ducts for areas (or units) indicated to have such sensors, except where a wall sensor is indicated on the plans provide a wall mount type. Install where units would be easily accessible for maintenance. Indicate locations on floor plans with submittals.
- M. Signal for Motor Control: For EC motor applications, Contractor shall assume that an analog signal is required to be provided by the control system as a constant reference speed, unless the control sequence requires otherwise. For VFD motor applications, Contractor shall assume that an analog signal is required to be provided by the control system as a variable reference speed, unless the control sequence requires otherwise. In either case, confirm the type of signal with the equipment supplier.
- N. Condensate Overflow: Provide all cooling coils (except not required for exposed AC units) with field installed condensate overflow switches wired to stop unit operation upon detection of a high condensate level and to indicate an alarm at the system graphics.

3.2 MONITORING DATA

- A. General: Monitoring information shall be provided at graphic user interface. Provide all necessary controls/devices to provide the data indicated. Monitoring data listed is not a "points list" but is a list of items that shall be monitored and is in addition to data (or "points") required by the sequence of operation and other specification requirements. A complete "points list" shall be compiled by the Division 25 Contractor based on all system requirements and sequence.
- B. Exhaust Fans:
1. Fan on/off status.

2. Fan commanded status (on/off).
3. Fan failure alarm; (i.e. not "proven" on when commanded on).

C. Air Handling Units (all units with fans and ability to heat or cool environmental air):

1. Zone temperature.
2. Zone temperature setpoint.
3. Unit commanded mode (heating/cooling).
4. Supply air temperature off unit.
5. Mixed air temperature at unit.
6. Percent commanded heating or cooling.
7. Override status.
8. Outside air and return damper positions (% commanded open).
9. Fan on/off.
10. FAN COMMANDED POSITION (ON/OFF).
11. Alarm/trouble conditions, shall include as a minimum: freezestat alarm; fan not "proven" on when should be on; heat failure alarm - SA temp not warmer than ma and unit is in heating; cooling failure alarm - SA not cooler than ma and unit is in cooling; "false" cooling or heating call - i.e. Unit calls for heating when OA temperature is above 70 deg F, unit calls for cooling and OA temperature is below 30deg F).
12. CARBON DIOXIDE LEVELS (AS NOTED ON AHU SCHEDULE).
13. VFD COMMANDED PERCENTAGE (FOR UNITS WITH VFD'S).

D. Water Heater:

1. Leaving HW temperature each water heater.
2. HWC temperature (at each HWC pump).
3. High tank temperature alarm (10 degrees above scheduled tank temperature).
4. HW temperature after TMV-1.
5. HW temperature from two water heaters.

E. Circulating Pumps:

1. On/Off status (by differential pressure device or flow switch).
2. Failure alarm (i.e. not "proven" on when commanded on).
3. Variable frequency drive (VFD) commanded position (as applicable).

F. Miscellaneous:

1. Outside Air Temperature (two locations).
2. Fire Alarm Status.

G. Energy Metering:

1. Building overall electrical consumption and demand.

2. Building overall gas consumption and peak flow rate.
3. Unit Commanded Mode (On/Off).

H. Zone Volume Dampers (Air Terminal Units):

1. **Zone temperature.**
2. **Supply air volume**
3. **Supply air temperature.**
4. **Damper commanded percentage.**

3.3 START-UP

- A. Calibration and Commissioning: As each part of the systems become operational, this Contractor shall calibrate all sensing and readout devices and shall test and observe the operation of each and every air moving and/or heating unit and shall adjust all controls so that the items function according to the intent of the specifications. The control contractor shall commission all controls prior to the work of Section 20 08 00 being done. This commissioning work shall include a point-to-point check of all devices, check of sequences, check of proper wiring, and documentation substantiating the work.
- B. Report/Statement: After making all necessary system testing and adjusting, the Contractor shall submit a report to the Engineer indicating all testing/adjustment work done and comment on how system is operating. Such report shall be signed by the individual directly responsible for supervision of the installation of the control system. When the Contractor feels that the system is complete and ready for review by the Engineer, Contractor shall submit a written statement (signed by same individuals as for report) stating that the system is in compliance with the project requirements and ready for review.
- C. Owner Instruction: See Section 20 05 00.
- D. Start-up Trend Logs: The Contractor shall submit to and review with the Engineer daily for a period of four weeks after substantial completion a hard copy log of the following:
1. Five Owner selected room temperature values at 15 minute intervals.
 2. Outside air temperature values at 15 minute intervals.
- E. Warranty Trend Logs: Two months after Owner acceptance of the work, the Contractor shall submit to and review with the Engineer a single tabulated 30 day hard copy printout of the systems historical data containing the following information:
1. Date.
 2. Hour by hour zone temperature, for five Owner selected rooms.
 3. Hour by hour OA temperature.
- F. Documentation: Contractor shall provide a hard copy documentation of the software application program for each digital controller (TUC, NAC). Documentation provided shall include block software flow chart showing the interconnection between each of the control algorithms and sequences for systems utilizing program listings. A program listing shall be printed onto the same blueprint, along with the program flow chart, and description of the sequence of operation. A hard copy of this document shall be stored and maintained in

each stand-alone digital controller panel. System acceptance shall not be completed until this documentation is provided and located in each panel.

3.4 ENGINEER REMOTE ACCESS

- A . Provide programming and coordination to allow remote access to the control system graphics by the Engineer, accessed from the Engineer's office via a web browser (Google Chrome or similar). Provide separate login/password for Engineer for such access. Contractor shall also provide efforts for setting up Trends and instructing the Engineer in setting up trends. This remote access shall be maintained prior to Substantial completion, through the warranty period.

3.5 COMMISSIONING

- A . The Products referenced in this section are to be commissioned per Division 01 and Section 20 08 00. The Contractor has specific responsibilities for scheduling, coordination, startup, test, development, testing and documentation. At a minimum, the Contractor shall provide a documented and signed record to verify that all equipment and systems installed under this contract have been inspected and functionally tested to verify full compliance with the contract specifications. In many cases, this shall require the Contractor to create or otherwise provide procedures and checklists for approval by the Commissioning Agent prior to the start of functional testing. Coordinate all commissioning activities with the Commissioning Agent.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A . Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 00 and Division 01 Specification Sections, apply to this Section.
- B . Requirements of Section 20 05 00 apply to this Section.

1.2 WORK INCLUDED

- A . Control System Design.
- B . Control System Sequence of Operation.

1.3 SUBMITTALS

- A . General: Comply with Section 20 05 00.
- B . Sequences: Submit complete description of sequence of operation for all systems. Sequence submitted shall not be a direct copy of the sequence specified herein, but shall be written to reflect the actual control sequences provided and to more closely match the actual programming used.
- C . Programming: Submit copy of system programming logic.

1.4 GENERAL REQUIREMENTS

- A . Bidder Design: The control system is bidder designed subject to the requirements of the Contract Documents.
- B . Modifications: Software, graphics, and sequences shall be revised and updated as necessary to reflect Owner or Engineer desired changes. Contractor to include in bid no less than 16 hours of control technician's/programmer's time to accomplish the required system modifications.
- C . Sequence Terminology: Wherever the control sequences refer to an article, device or piece of equipment in the singular number, such reference shall mean to include as many of such articles, devices, or equipment as are shown on the plans, required for the sequence, or required to complete the installation. Wherever the control sequence refers to an operating stage in the singular number, such reference shall mean to include as many stages as are specified for the equipment and shall mean analog (i.e. proportional) type control where specified for the equipment (reference drawings and equipment specifications).
- D . All DDC Control: All controls and sequences shall be provided by the Division 25 DDC control system, unless specifically noted otherwise. Where interval timer, switch control, or a similar manual control is indicated, the control device shall provide an input to the DDC system with the DDC system providing an output for control. No line voltage controls or other controls which do not "pass through" the DDC control system are allowed, unless directly stated that is the method of control to be used. Exceptions to DDC Control: emergency shut-down and similar safety devices required (or noted) to be hard wired.

PART 2 - PRODUCTS

NOT USED

PART 3 - INSTALLATION

3.1 GENERAL

A . Complete System:

1. General: Provide complete control system design, all software, programming, wiring, and control devices as required to allow for automatic control of all mechanical equipment and other systems as indicated; with sequences of operation and features specified. Provide all control interconnections between indoor and outdoor units, all required control connections between equipment components, and to any other devices needed for proper operation. See also Section 25 50 00 for related requirements.
2. Various thermostats, motorized dampers, and other devices are not shown on the drawings but are required per the sequence of operation specified. Coordinate with Engineer for location of all such devices prior to installing. Indicate proposed locations on submittals.

B . Sequences:

1. Additional Sequences: See Section 25 50 00 for system requirements that relate to control sequences; see drawings for additional control sequences and requirements.
2. Control Action: Sequences which involve maintaining a setpoint in response to variable conditions shall use proportional-integral (PI) or proportional-integral-derivative (PID) control (unless noted otherwise). Sequences shall comply with the system performance requirements and other requirements of Section 25 50 00.
3. Missing Sequences: Where no sequence of operation is indicated submit a proposed sequence to the Engineer for review. Such sequences shall match the intended equipment use, code, and ASHRAE standards for the type of equipment and application. HVAC equipment shall have control of heating/cooling operation by area thermostats and control of unit components (i.e. fans dampers) to allow for distribution of heating/cooling and control of ventilation air; fans and similar on/off items shall have time schedule and thermostat control (unless the application clearly implies a different method).

C . Settings:

1. Adjustability: All settings, setpoints, and differentials shall be adjustable. All setpoints indicated are initial settings.
2. Confirm Settings: Confirm with Owner all setpoints, all time schedules, and all other adjustable programming parameters before substantial completion.
3. Thermostat Setpoints: Shall be adjustable at operator's workstation, with initial settings as follows unless indicated otherwise:

| | |
|--------------------|--------------|
| Occupied Heating | 70 degrees F |
| Unoccupied Heating | 65 degrees F |
| Occupied Cooling | 75 degrees F |
| Unoccupied Cooling | 85 degrees F |

D . Time Control:

1. Control system shall provide time schedules for occupied/unoccupied mode switching for all items having sequences with occupied/unoccupied modes, and for all items indicated as having time schedule control.
2. Provide independent time schedules for all mechanical equipment, except where equipment is indicated to be interlocked to other equipment.
3. Provide seasonal (i.e. time of year) control for all mechanical equipment.
4. Provide a single Holiday Schedule or Master Holiday schedule for logical equipment groups as directed by the Owner at submittal time and revised by the Owner during the Owner training. At the end of the warranty period readjust the grouping of equipment as directed by the Owner.
5. Provide independent optimum start schedules (i.e. warm-up cycles) for mechanical equipment indicated to have (or required to have) optimum start.
6. VRF Heat Pump System: Shall operate under its own controls. See Section 23 81 27 for VRF sequences.

E . Hand-Off-Auto Control: Provide all control devices and connections to allow Hand-Off-Auto (HOA) control of all controlled items; where unit starters or VFD's provide HOA control no additional controls are required, but this Section controls shall be arranged to allow for HOA controls.

F . Average Thermostats: Where average thermostats are indicated on plans combine and average requirements from each sensor and use these average requirements to control unit. Averaging shall combine the deviation from setpoint from each thermostat and rate of change of this deviation combined to create control values as if they are from a single thermostat to determine control actuation. Each thermostat shall have the same functions as the other. Provide means (at GUI, in single screen command) the ability to select between use of either thermostat.

G . Variable Speed Operation: On variable speed (including staged) equipment, start equipment low speed (or other appropriate speed as recommended by equipment manufacturer or system requirements) and control speed changes at a rate that is coordinated with other equipment to provide proper system operation without undesirable effects, nuisance trips and system alarms.

H . Alarms: Provide alarms for the following:

1. Status of item does not equal commanded status (where proof of status is monitored, e.g. supply fan not proven on when commanded on).
2. Equipment in alarm (where equipment alarm state is monitored).
3. System response is not consistent with commanded response (e.g. air handling unit SA temperature is not less than MA temperature and unit is commanded to cooling).
4. Safety device alarm (where device is monitored by or connected to the control system).
5. Space temperature in alarm range (10 deg F or more above cooling setpoint; 10 deg F or more below heating setpoint).
6. Sensor failure (out of range).

I . Fire/Smoke Shutdown:

1. Smoke Detector: Provide necessary conduit, wiring, and accessories to shutdown each unit upon activation of that unit's smoke detectors. Connections shall be hardwired; independent of any control system logic, so that failure of control system or loss of control system will in no way prevent the shutdown of each unit. In addition to shutting down the unit with the alarmed smoke detector, all equipment interlocked or served by that unit shall be off. Other units shall also shut-off as required to avoid building pressure differentials and similar undesirable effects.
2. Fire Alarm System: Shut-down all air handling equipment when the building fire alarm system goes into alarm. Contacts in the fire alarm system are available for this purpose. This shut-down may be accomplished by use of control logic and is not required to be hardwired but shall be of a fail-safe nature so as to provide the necessary shut-down in case of control failure and the control components shall be rated for such purposes (as required by the AHJ).

J. Automatic Restart:

1. General: Equipment shall automatically restart after being shut-off by a power outage, fire alarm, smoke detector, or similar alarm (or fault); upon clearing of the alarm (or fault). System shall revert to its normal operation for the conditions at the time of restarting.
2. Controlled Restart: Provide controlled re-start by building wing or building floor and in a manner to prevent pressure differentials, equipment issues, or other undesirable effects. Provide time delay on the re-start of equipment 2.5 KW and larger to minimize electrical surges.

- K. Interlocks: May be accomplished by software rather than field hard wired relays or other devices, except for: fire alarm shut-down of equipment 2000 cfm and greater, freezestat shutdown, boiler and chiller emergency shut-off switches, where required by manufactures, where required by AHJ, and where noted to be hard-wired.

3.2 VRF SYSTEM – SEQUENCE OF OPERATION

- A. Heat Pumps: See Section 23 81 27.
- B. DOAS ERV Units: See below.
- C. ERV Outside Air and Exhaust Dampers: See below.
- D. VRF Off/Auto: Provide output to VRF controls to enable (in auto) or disable (off) the VRF system.
- E. OA/Relief Damper serving DOAS HRUs: Shall open when the system is in the occupied mode, and shall close when the system is in the unoccupied mode.
- F. DDC system shall provide interface to allow reset of temperature setpoint, occupied/unoccupied schedule, and VRF system alarms at the campus facilities office.

3.3 DOAS ERV UNITS

- A. General: VRF controls (See Section 23 8127) shall provide time schedule control of the Energy Recovery Unit (ERV) in conjunction with the heat pump units. ERV mode shall match the mode for the VRF system served, except that when any heat pump (served by the ERV) is in the occupied mode, the ERV shall be on in the occupied mode.

B. Occupied Mode:

1. Fans: Supply and exhaust fans are on.
2. Outside Air and Exhaust Air Dampers: 100% open.
3. Bypass Damper and Economizer: The bypass damper shall be closed (to allow energy recovery) unless: the outside air temperature is above 60 deg F (adjustable) and is lower than the exhaust air temperature and the majority of areas served by the ERU are in cooling then the outside air bypass damper shall be activated so that outside air bypasses the energy recovery coil (for economizer cooling).

C. Unoccupied Mode: Unit shall be off. OA/EA Dampers shall be closed.

D. Warm-Up Mode: Unit shall be off. OA/EA Dampers shall be closed.

E. Frost Control: Controlled by ERV integral controls. When the exhaust air temperature drops below the frost control setpoint (initial setting 35 deg F), the outside air damper shall bypass the energy recovery coil to prevent frost buildup due to freezing condensate.

3.4 FANS

A. General: See "Control" column on Fan Schedule for which of the following control method is required. See notes on plans for control of fans not listed below and other requirements. Where interval timer, switch control, or a similar manual control is indicated, the control device shall provide an input to the DDC system with the DDC system providing an output for control. No line voltage controls or other controls which do not "pass through" the DDC control system are allowed, unless directly stated that is the method of control to be used.

B. Wall Switch: Fan shall be controlled by on/off wall switch. Fan shall be on when switch is in the on position, and be off otherwise.

C. Interval Timer: Fan shall be controlled by interval timer, to be on when timer is activated and off otherwise.

D. Time Schedule: Fan shall run from time schedule.

E. Time Schedule and Interval Timer: Fan shall run in low speed via time schedule, and operate in high speed when interval timer is activated (regardless of time schedule).

F. Dampers: Motorized Dampers at Exhaust Fans shall open when fans runs and shall be closed otherwise.

3.5 ELECTRIC HEATERS – DUCT TYPE

A. General: Heater shall be controlled by a space thermostat to provide heating to satisfy space conditions.

B. Operation, SCR Heaters: Provide proportional control of heater to vary heater output to provide 72°F (adjustable) discharge air temperature.

C. Interlock: Shall be hard-wire interlocked with the supply fan on the unit which serves the heater, to only allow heater operation when the unit's fan is proven on. Provide differential pressure switch or CT's at unit fan to provide interlock and proof of operation.

3.6 PUMPS

- A. Domestic HW Circulation Pumps: Pump shall be enabled to operate by time schedule. When enabled, pump shall be controlled in conjunction with a sensor in the hot water recirculation line. When HWC falls to 5 degrees F below setpoint, the pump shall run; when temperature returns to setpoint, pump shall be off. Setpoint and differential shall be adjustable. Initial setpoint shall be 5 degrees less than domestic hot water setting for system used on.
- B. Sump Pumps: Sump Pumps shall operate via controls provided with pumps. Provide high level alarm monitoring by DDC.

~~3.7 ZONE DAMPERS~~

- ~~A. General: Damper shall be controlled by a wall mounted thermostat to vary the air volume supplied to the zone to satisfy space conditions. Airflow shall vary from damper maximum and minimum positions; coordinate with balancer for settings.~~
- ~~B. Changeover: A changeover supply air duct temperature sensor shall be provided to reverse damper operation to allow proper control depending on whether the unit supplying the zone damper is in heating or in cooling. Changeover to "Unit in Heating" mode shall occur whenever the supply air temperature is 3 degrees above room temperature; changeover back to "Unit in Cooling" mode shall occur whenever the supply air temperature is below room temperature.~~
- ~~C. Occupied Mode:
 - 1. Unit in Cooling: When the unit serving the zone damper is in cooling and the zone temperature rises, the air volume to the zone shall increase to maintain the zone setpoint. As the zone temperature falls, the air volume to the zone shall decrease to maintain the zone setpoint.
 - 2. Unit in Heating: When the unit serving the zone damper is in heating the zone damper operation shall be reversed from when the unit is in cooling. As the zone temperature rises, the air volume to the zone shall decrease to maintain the zone setpoint. As the zone temperature falls, the air volume to the zone shall increase to maintain the zone setpoint.~~
- ~~D. Unoccupied Mode: Same as for occupied.~~
- ~~E. Warm-Up Mode: Same as for occupied.~~

3.8 DOMESTIC WATER HEATERS

- A. High Temperature Shutdown: Provide water heaters with hard wired high temperature shutdown safety, which will stop water heater operation and alarm at EMCS; set initially for 10 degrees F above water heater setpoint.

3.9 MISCELLANEOUS

- A. Miscellaneous Dampers/Devices: See plans for other dampers and devices requiring control. Provide control indicated. Where control is not indicated provide standard sequence typical for such devices in similar projects/applications.

3.10 VAV TERMINAL UNITS (SHUT-OFF NO HEAT)

A . General:

- 1. General:** Unit damper shall be controlled by space temperature sensor to vary the air volume supplied to the space to satisfy space setpoint.
- 2. Airflow:** Airflow shall vary between maximum and minimum positions scheduled. Airflow shall be constant for fixed room thermal requirements and modulate using the variation of room temperature from setpoint. Unit damper operation shall be pressure independent with commanded airflow constant (plus or minus 5%) regardless of pressure variations at terminal unit inlet. Unit airflow shall be measured (using inlet average velocity pressure and inlet duct area factor)

- #### **B . Changeover:** Air Handling Unit (AHU) supply air temperature sensor shall reverse VAV unit damper operation to allow proper control depending on whether the AHU supplying the VAV unit is in heating or in cooling. Changeover to “AHU in Heating” mode shall occur whenever the supply air temperature is 3 degrees above room temperature; changeover back to “AHU in Cooling” mode shall occur whenever the supply air temperature is below room temperature.

C . Occupied Mode:

- 1. AHU in Cooling:** When the unit serving the VAV terminal unit is in cooling and the space temperature rises, the air volume to the space shall increase to maintain the space setpoint. As the space temperature falls, the air volume to the space shall decrease to maintain the space setpoint.
- 2. AHU in Heating:** When the unit serving the VAV terminal unit is in heating the operation shall be reversed from when the VAV terminal unit is in cooling. As the space temperature rises, the air volume to the space shall decrease to maintain the space setpoint. As the space temperature falls, the air volume to the space shall increase to maintain the space setpoint.

D . Unoccupied Mode:

- 1. AHU Off:** Damper set in the minimum airflow position, heating coil control valve closed.
- 2. AHU On:** Same as for the occupied mode but using unoccupied mode setpoints.

- #### **E . Warm-Up Mode:** Shall coincide with AHU warm-up mode. Same as for the occupied mode.

END OF SECTION

B I D P R O P O S A L

City of Tacoma
Tacoma Public Library

Name of Firm: _____
(Write in company name)

In compliance with the contract documents, the following bid proposal is submitted:

BASE BID:

Lump sum base bid is inclusive of the Scope of Work described in the Contract Documents. See sheet G250 for delineation of Library and Tenant areas.

| | |
|---|-----------------|
| BASE BID – LIBRARY IMPROVEMENTS: | \$ _____ |
| BASE BID – TENANT IMPROVEMENTS: | \$ _____ |
| SUBTOTAL: | \$ _____ |
| <u>WA STATE SALES TAX @ 10.3%:</u> | \$ _____ |
| GRAND TOTAL: | \$ _____ |

BID ALTERNATES: (do not include Washington State Sales Tax)

The undersigned proposes to modify the contract requirements and scope of work as defined in the Contract Documents and as described in the Project Manual, for the following amounts to be added to the Base Bid. The Owner reserves the right to accept or reject any or alternates within (90) days of the bid date.

CARNEGIE RESTROOM RENOVATION **\$** _____



architecture
design
preservation

159 western avenue west, suite 486
seattle, washington 98119
office 206 775 8668

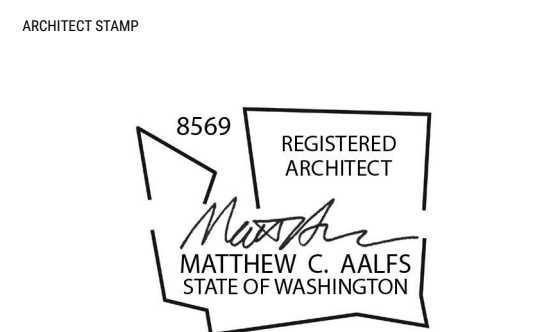
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PROJECT
**Tacoma Public Library
Main Branch Renovation**

LOCATION
**1102 Tacoma Ave S
Tacoma WA 98402**

PREPARED FOR
**Tacoma Public
Library**

| REVISION | DATE | NAME |
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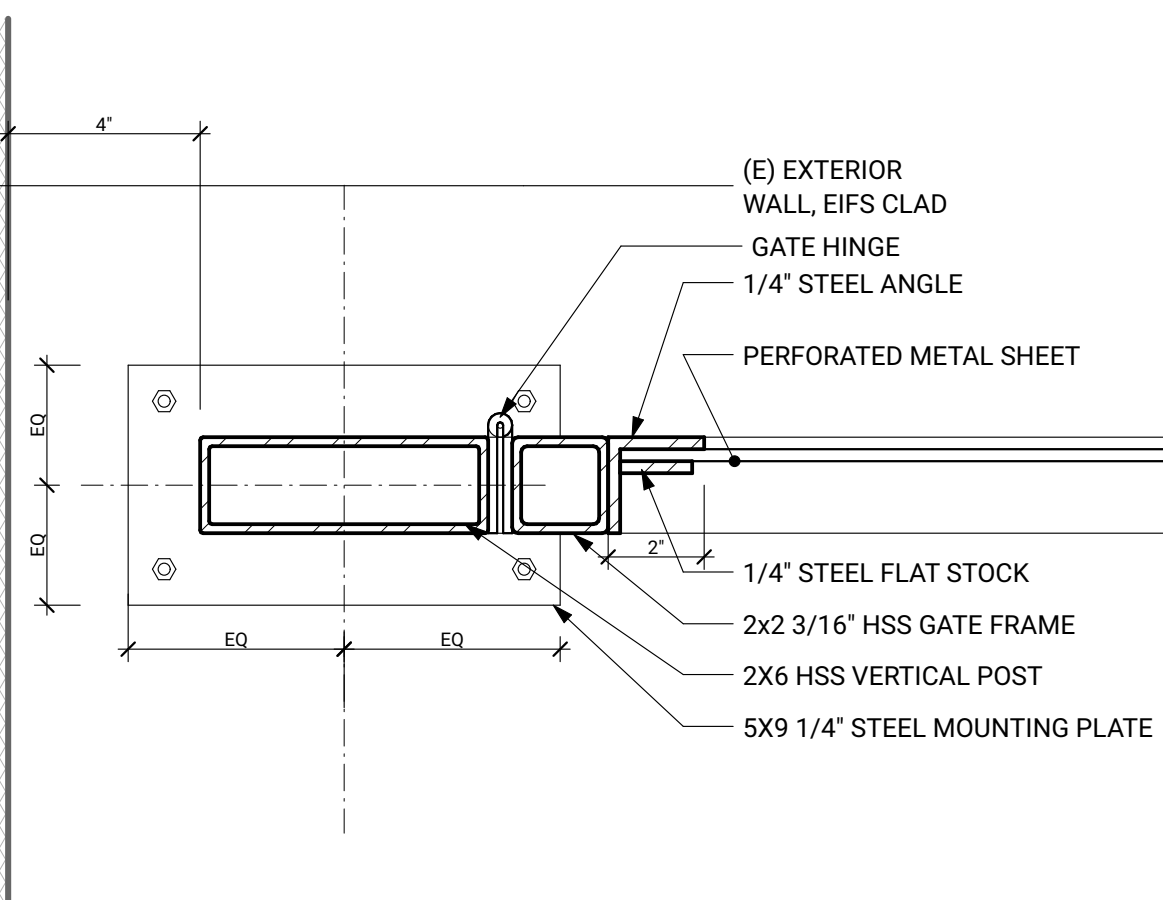
PLAN DETAILS

08/04/2023

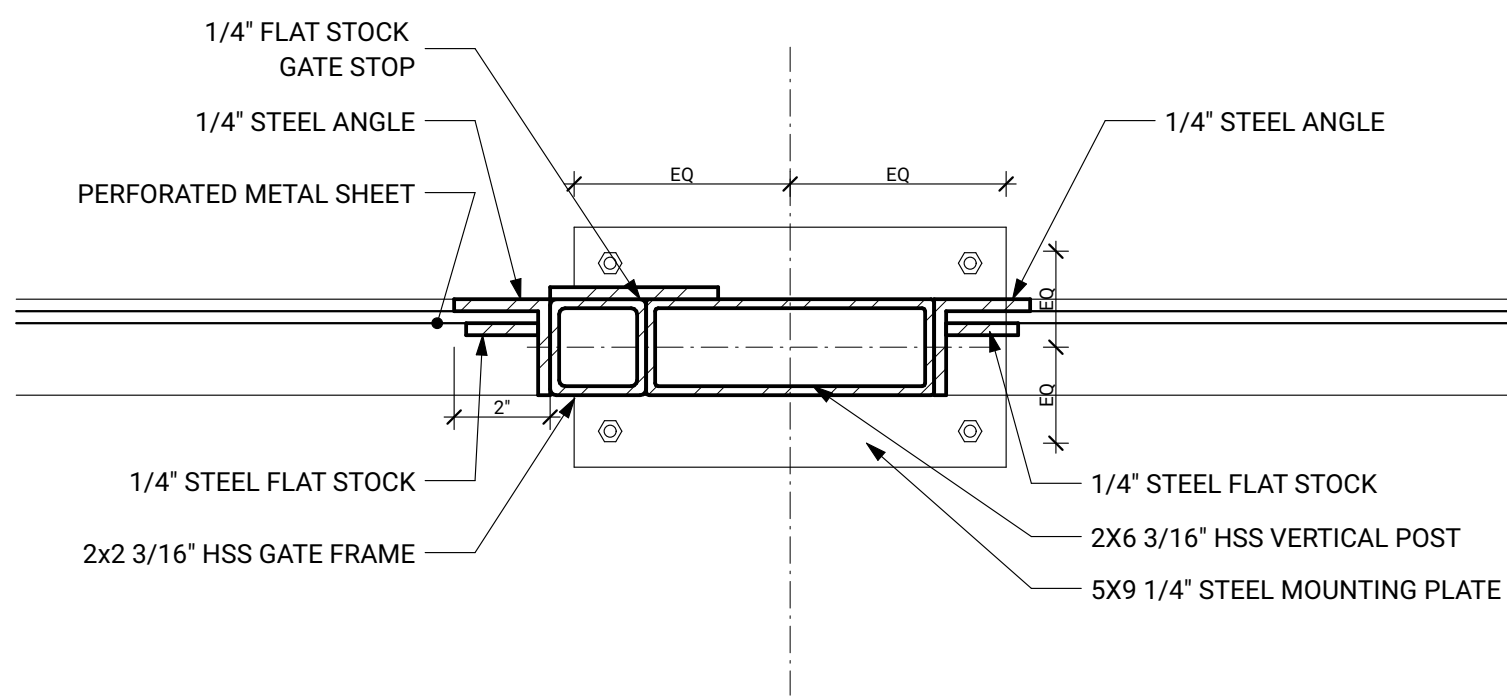
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A421

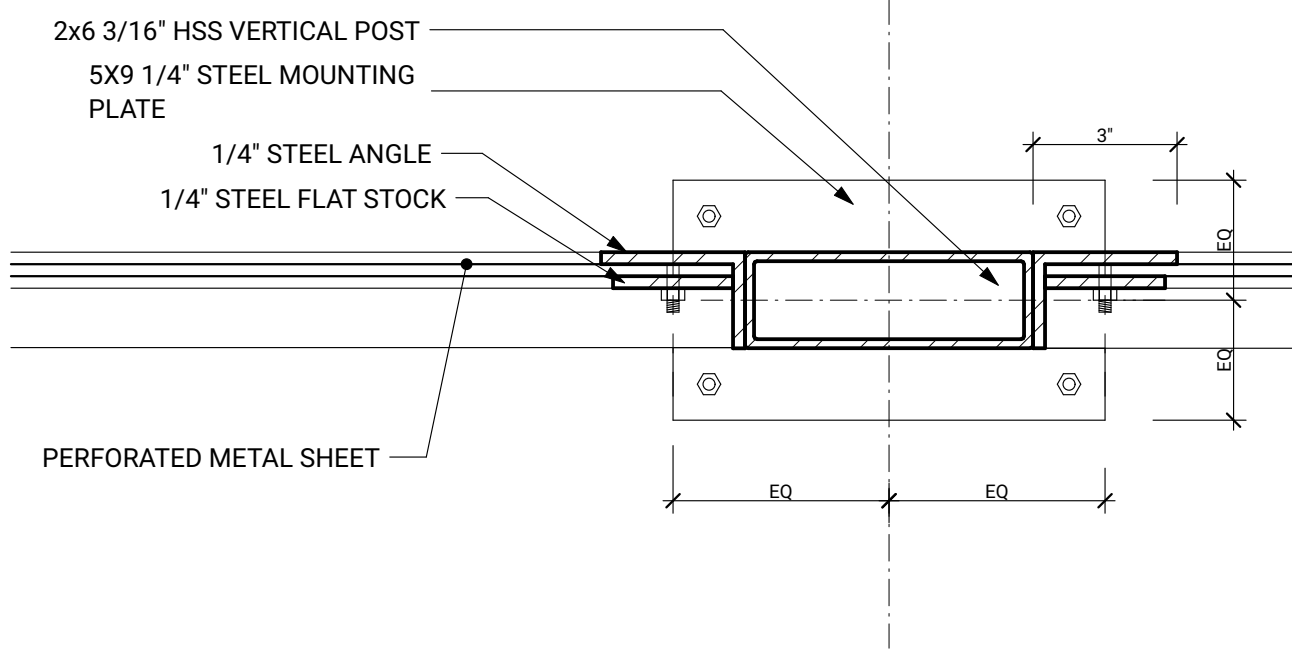
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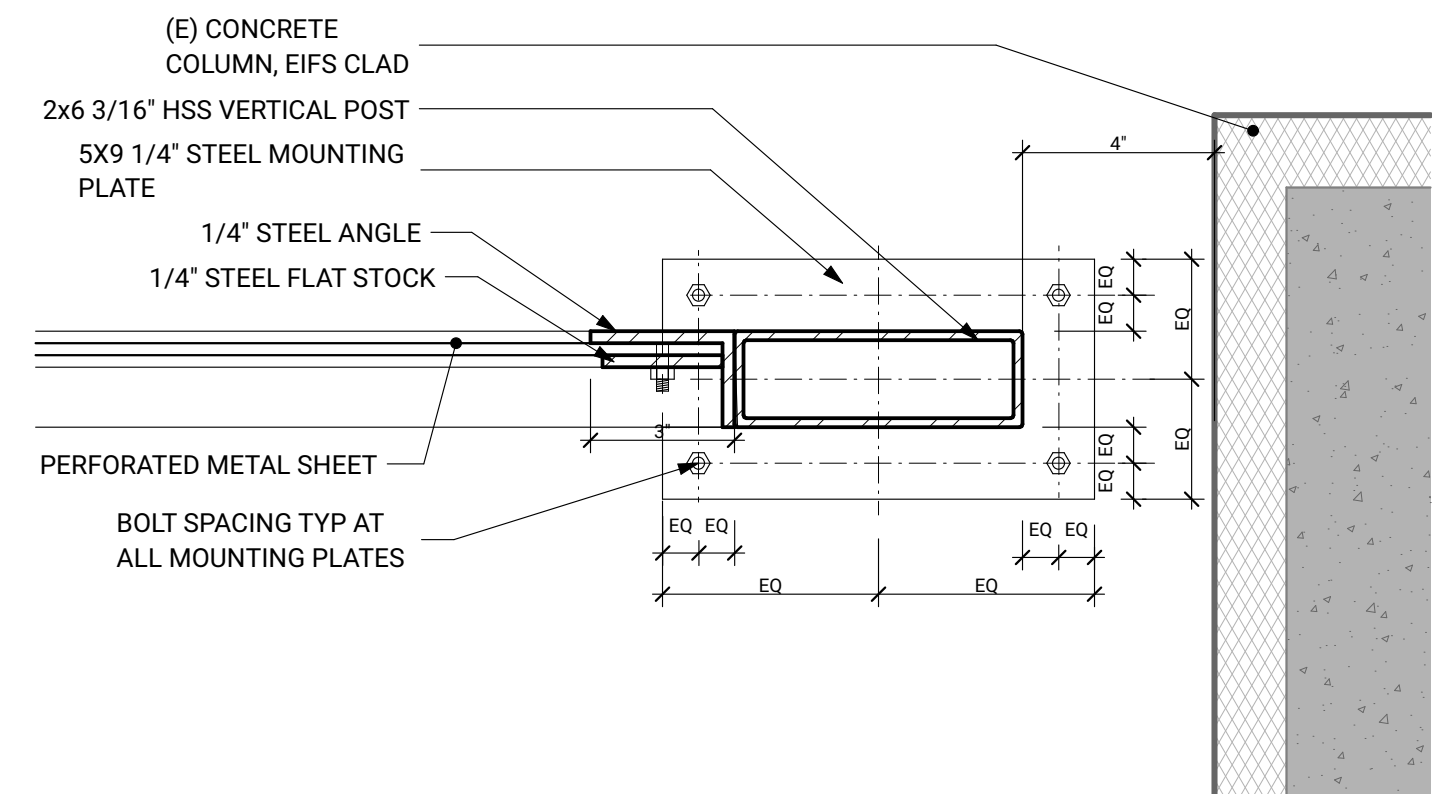
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A421 SCALE: 3" = 1'-0"



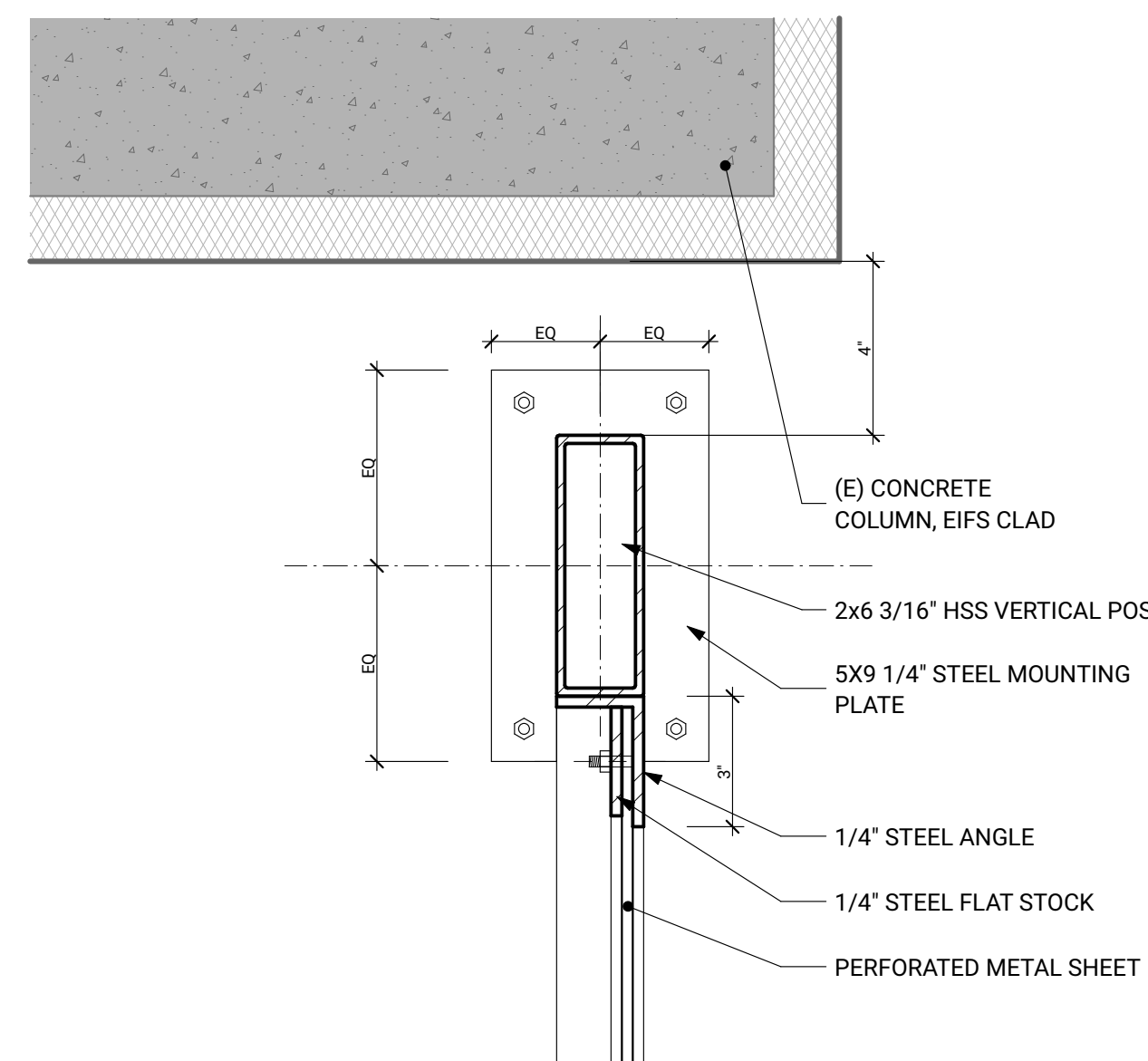
5 LEVEL 2 ENTRY, GATE JAMB (WEST)
A421 SCALE: 3" = 1'-0"



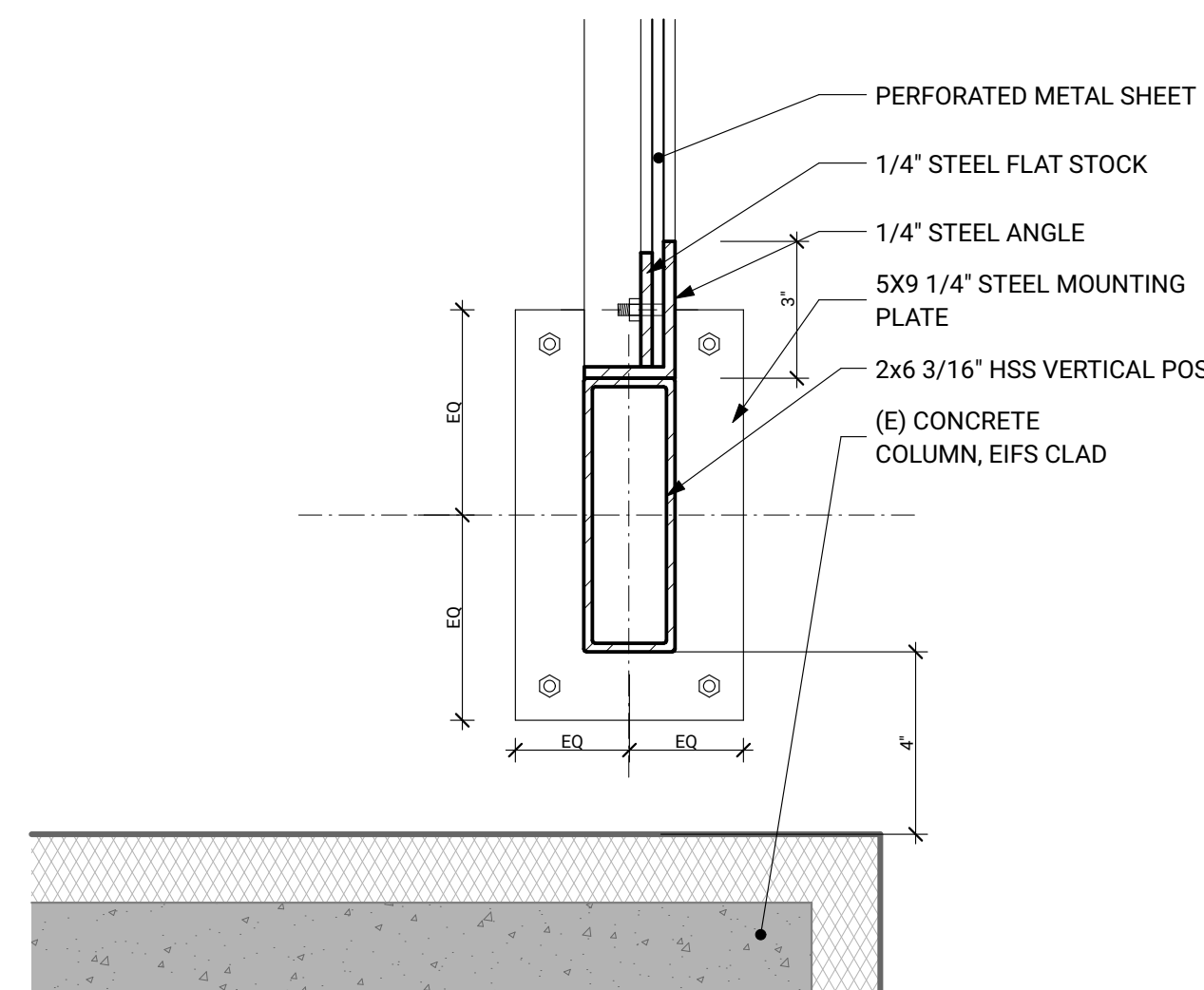
4 LEVEL 2 ENTRY, CENTER POST (WEST)
A421 SCALE: 3" = 1'-0"



3 LEVEL 2 ENTRY, POST @ (E) COL. (WEST)
A421 SCALE: 3" = 1'-0"



2 LEVEL 2 ENTRY, POST @ (E) COL. (NORTHWEST)
A421 SCALE: 3" = 1'-0"



1 LEVEL 2 ENTRY, POST @ (E) WALL (NORTHWEST)
A421 SCALE: 3" = 1'-0"





PROJECT
**Tacoma Public Library
Main Branch Renovation**

LOCATION
**1102 Tacoma Ave S
Tacoma WA 98402**

PREPARED FOR
**Tacoma Public
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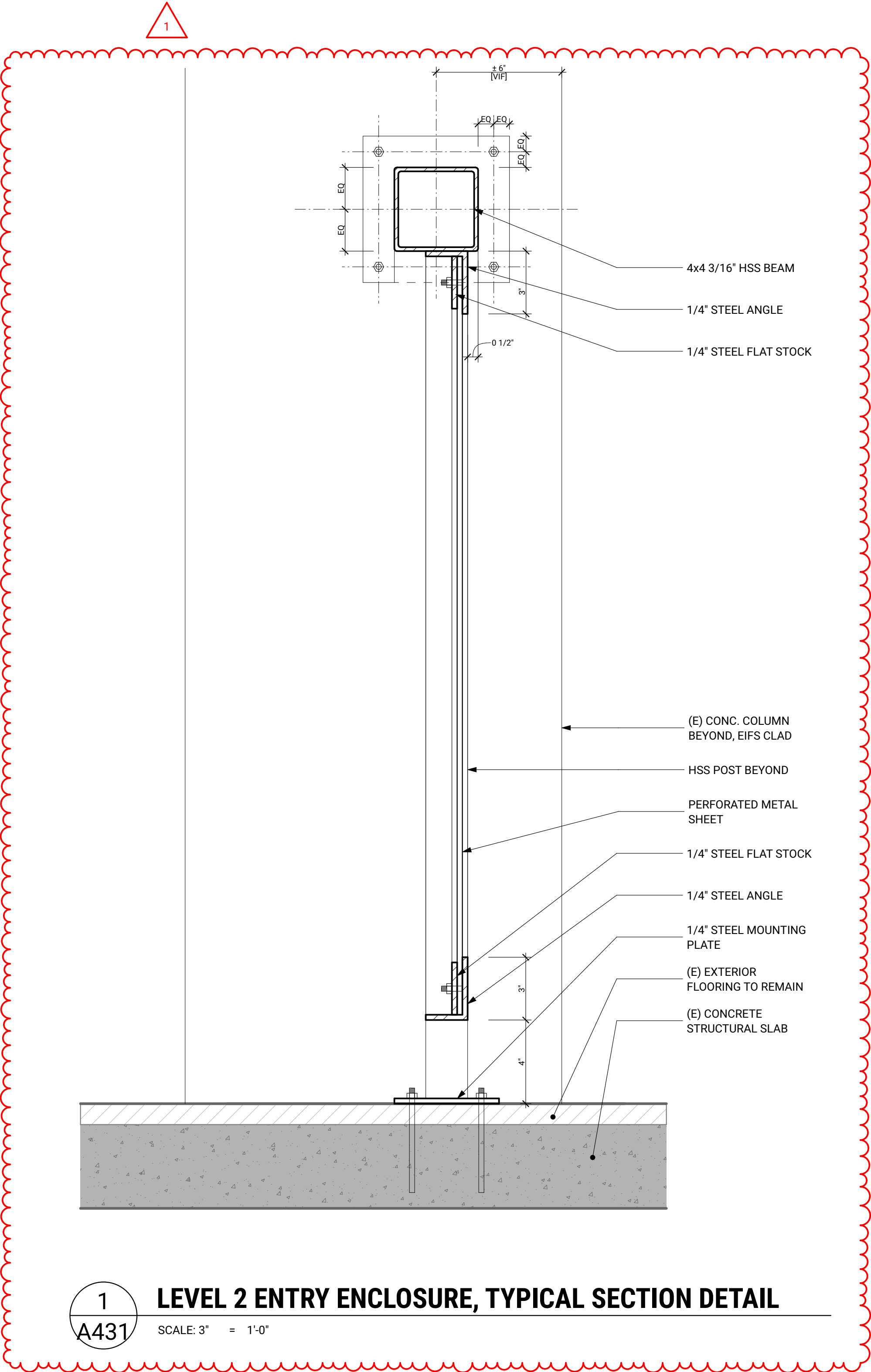


SECTION DETAILS

08/04/2023

Bid Set

A431



PROJECT
**Tacoma Public Library
Main Branch Renovation**

LOCATION
**1102 Tacoma Ave S
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**MAIN BUILDING, LEVEL 1
ENLARGED MAKERSPACE
PLANS**
08/04/2023

Bid Set

A513

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ENLARGED PLANS
GRAPHIC LEGEND

TYPICAL ASSEMBLY NOTATION:

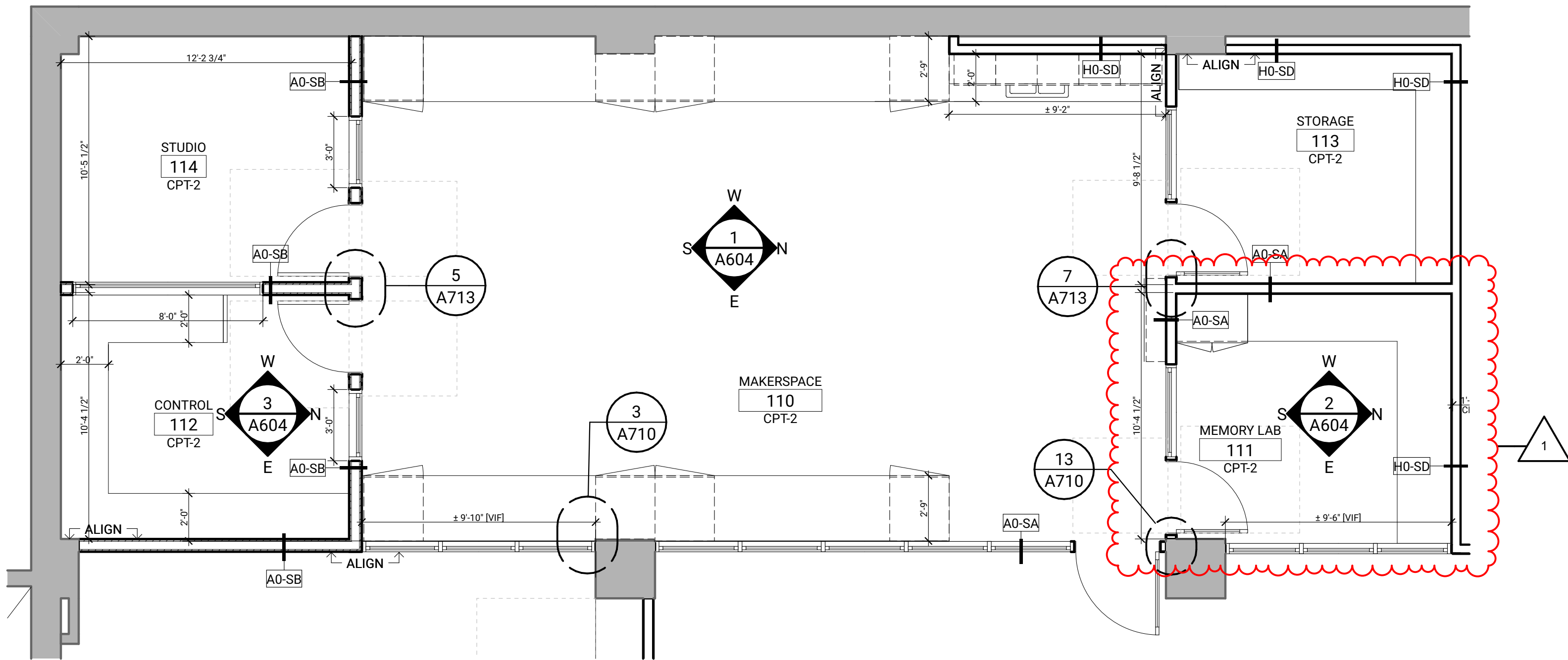
- EXISTING TO REMAIN
- NEW CONSTRUCTION

ENLARGED PLAN NOTES

- SEE SHEET G001 FOR GENERAL NOTES
- DIMS ARE TO FACE OF CONCRETE (FOC) OR FACE OF STUD (FOS) UNLESS NOTED OTHERWISE
- SEE G240 FOR CLEAR SPACE DIMENSIONS AND MOUNTING HEIGHTS OF TOILET ACCESSORIES
- SEE SHEET A701 FOR INTERIOR WALL ASSEMBLIES
- SEE SHEET A910 FOR DOOR SCHEDULE
- ALL FLOOR LEVELS DENOTE TOP OF FLOOR FINISH, U.N.O.
- VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS. COORDINATE ANY DIMENSION

FLOOR PLAN FINISH LEGEND

- CPT-1 CARPET TYPE 1 (LIVING RM)
- CPT-2 CARPET TYPE 2 (TEEN AREA)
- CPT-3 CARPET TYPE 3 (CHILDRENS)
- CPT-4 CARPET TYPE 4 (FIELD)
- CPT-5 CARPET TYPE 5 (CARNEGIE STAIRS)
- CT-1 CERAMIC TILE TYPE 1 (FLOOR)
- CT-2 CERAMIC TILE TYPE 2 (WALL)
- WOM WALK OFF MAT
- RF-1 RESILIENT FLOORING
- PT-1 PAINT, ACCENT 1
- PT-2 PAINT, ACCENT 2
- PT-3 PAINT, ACCENT 3
- PT-4 PAINT, BUILDING STANDARD
- PT-5 PAINT, COMMUNICATING STAIR
- PT-6 PAINT, RESTROOMS (EPOXY)
- PT-7 PAINT, CEILING
- PT-8 PAINT, HM DOOR FRAMES



1 LEVEL 1, MAIN BUILDING - MAKERSPACE
SCALE: 1/4" = 1'-0"

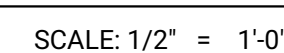
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REGISTERED
ARCHITECT

Matthew C. AalFs

MATTHEW C. AALFS
STATE OF WASHINGTON

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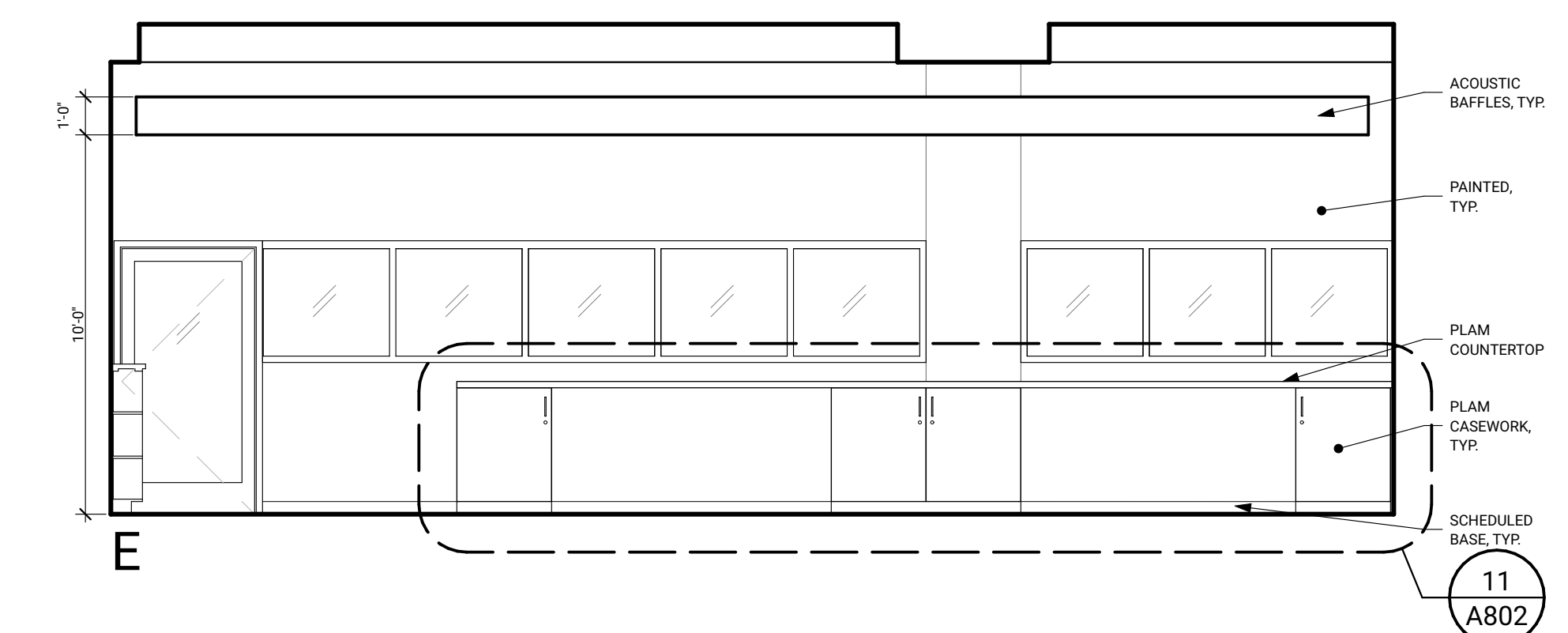
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Matthew C. Aalfs

MATTHEW C. AALFS
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PROJECT
**Tacoma Public Library
Main Branch Renovation**

LOCATION
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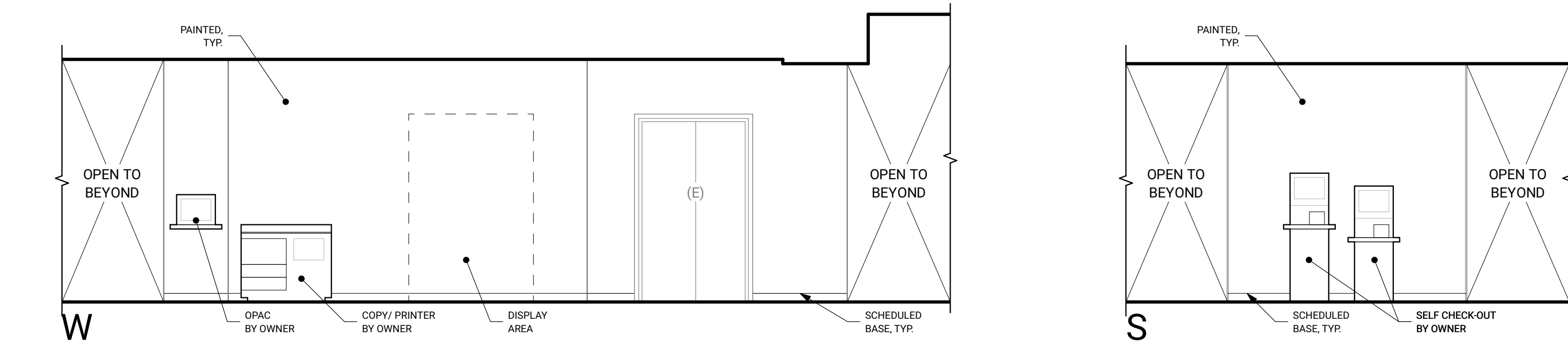
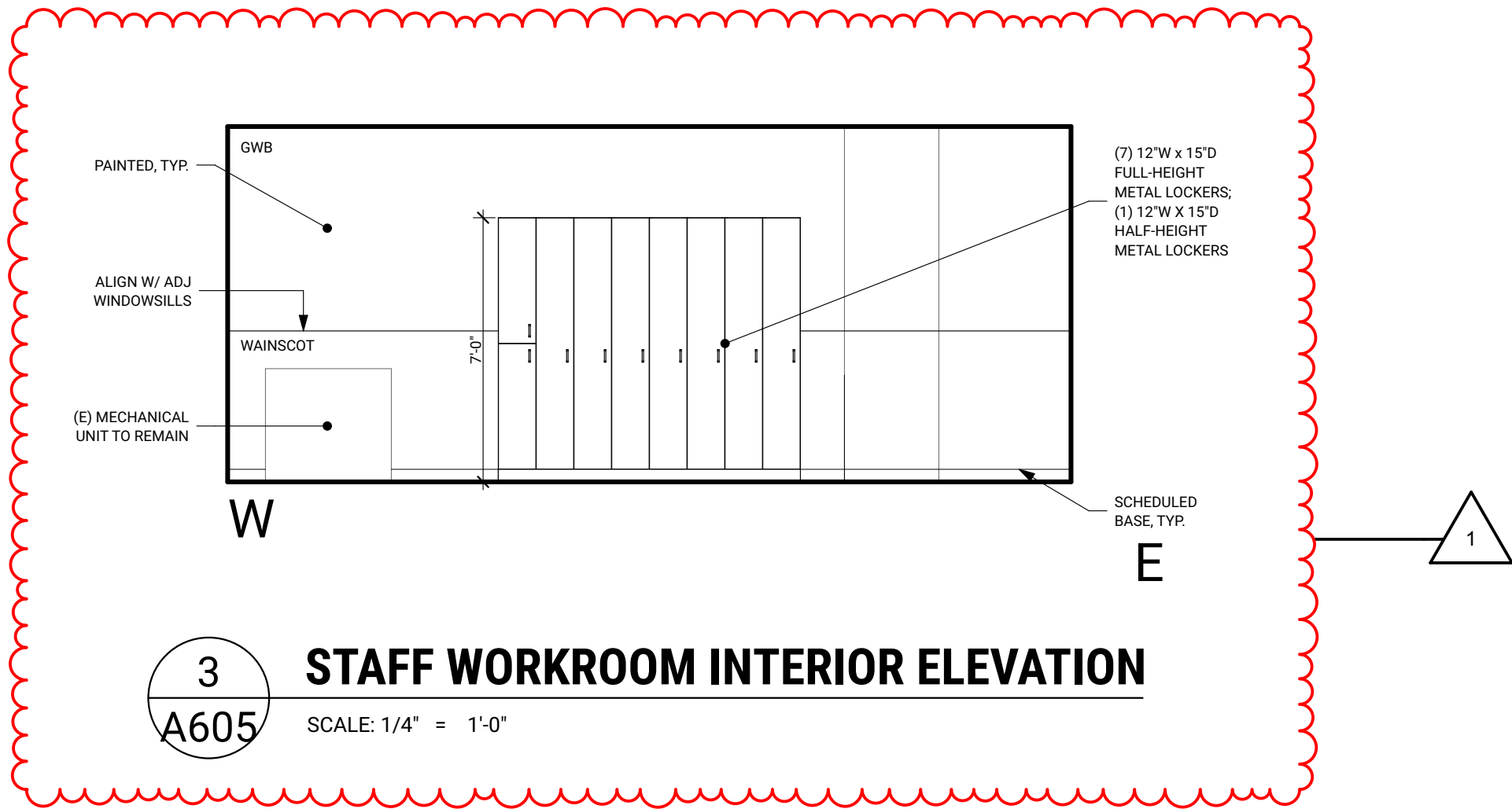
**MAIN BUILDING, INTERIOR
ELEVATIONS**

08/04/2023

Bid Set

A605

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PROJECT
**Tacoma Public Library
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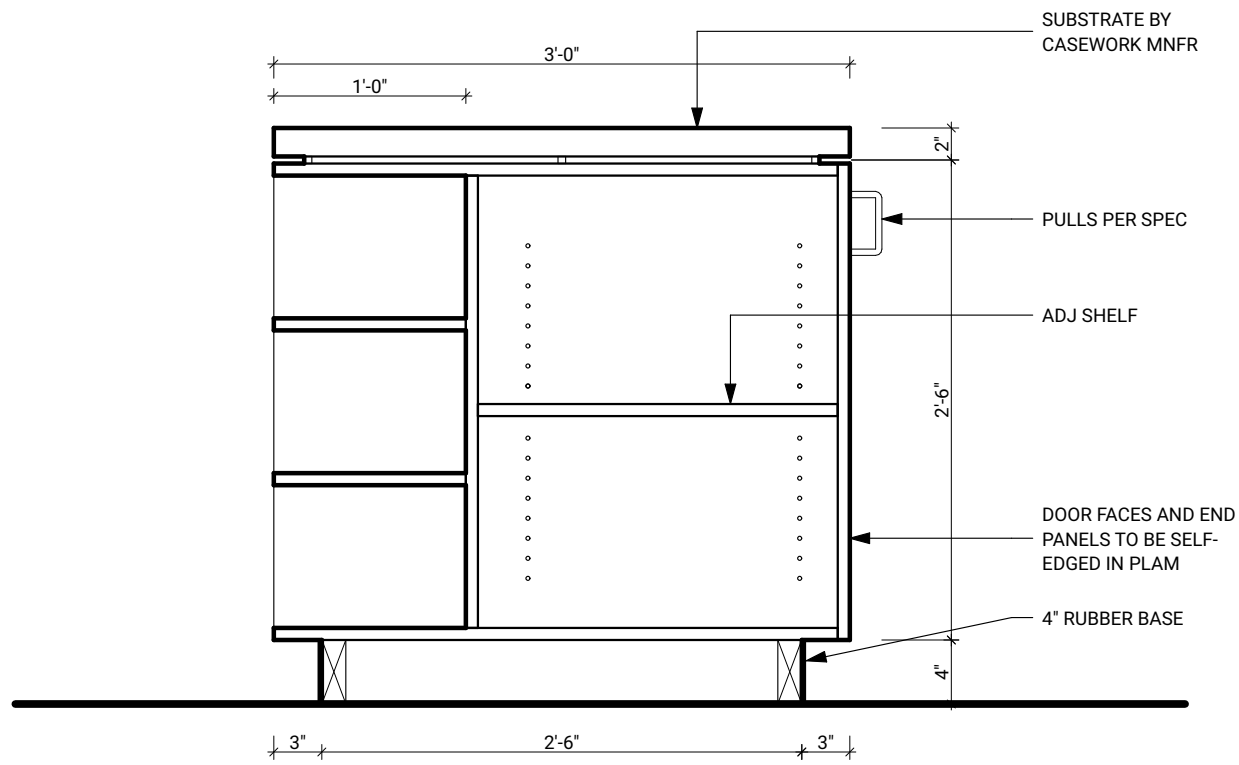
CASEWORK DETAILS

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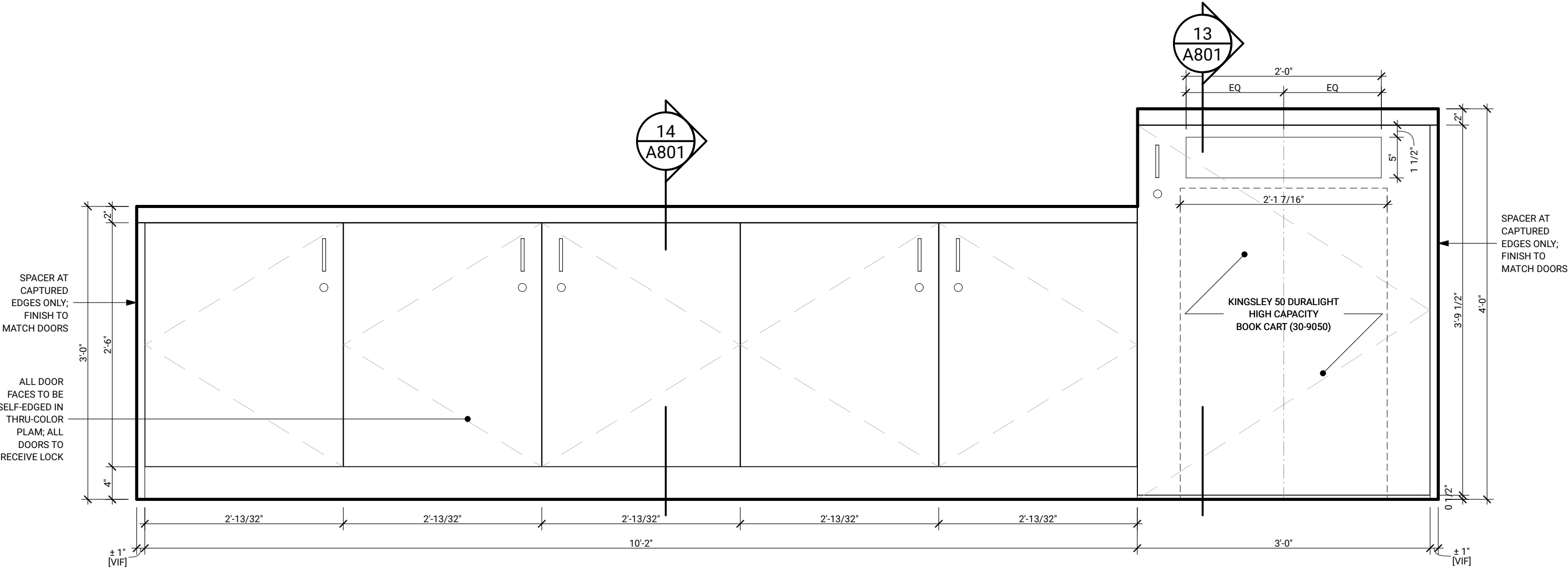
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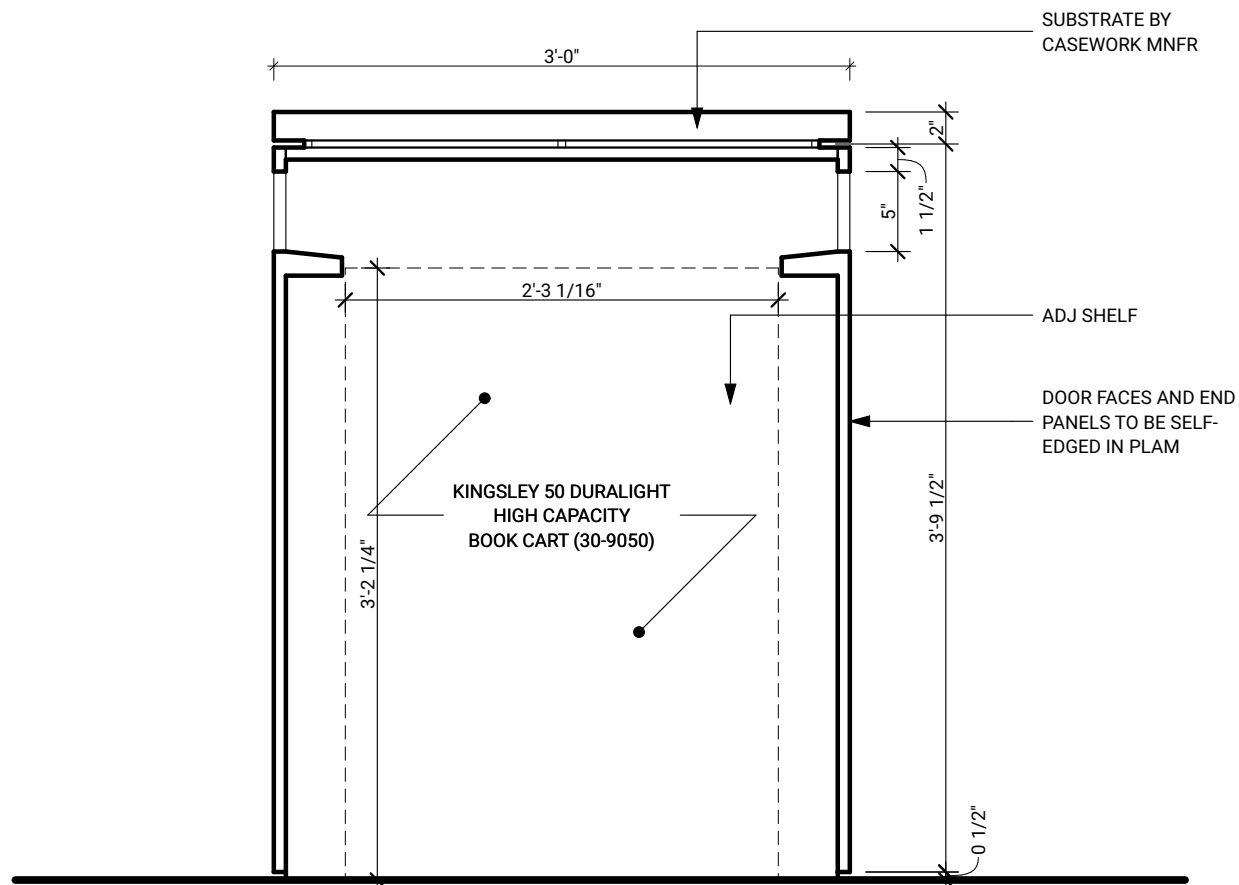
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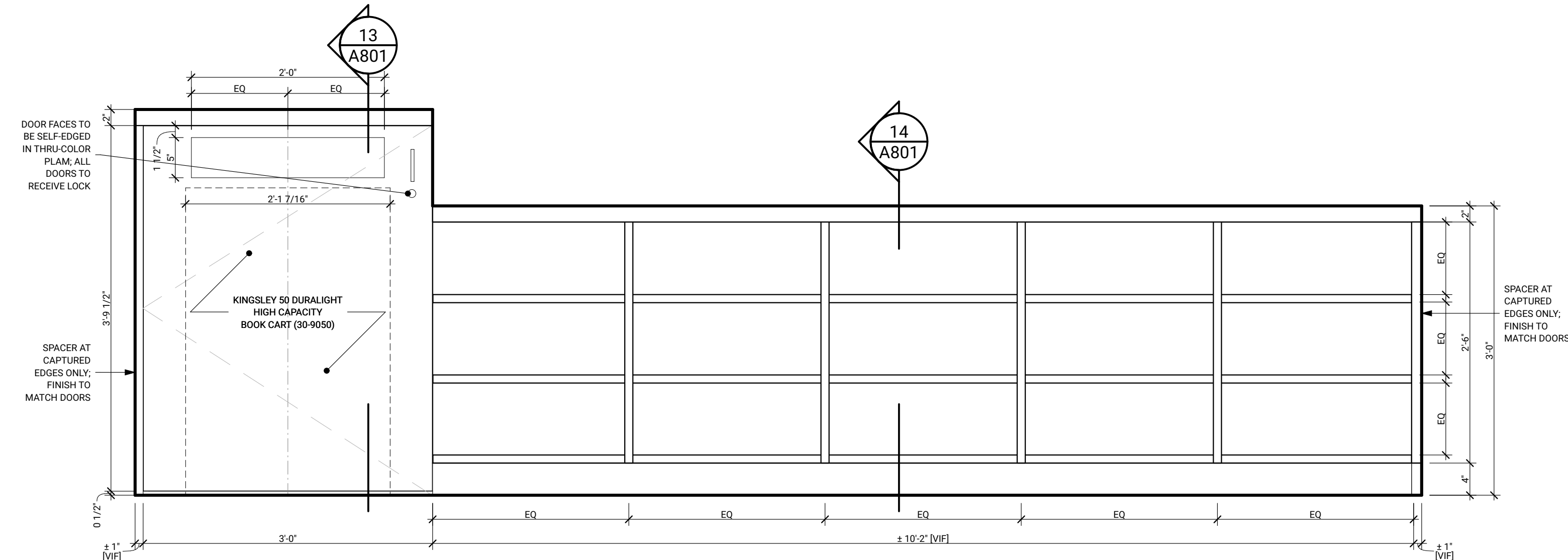
14 FORMS AND FRIENDS CASEWORK
SCALE: 1" = 1'-0"



2 FRIENDS OF LIBRARIES LOCKING STORAGE AND BOOKDROP
SCALE: 1" = 1'-0"



13 TWO-SIDED BOOKDROP CASEWORK
SCALE: 1" = 1'-0"



1 FORMS AND BOOKDROP CASEWORK
SCALE: 1" = 1'-0"

PROJECT
**Tacoma Public Library
Main Branch Renovation**

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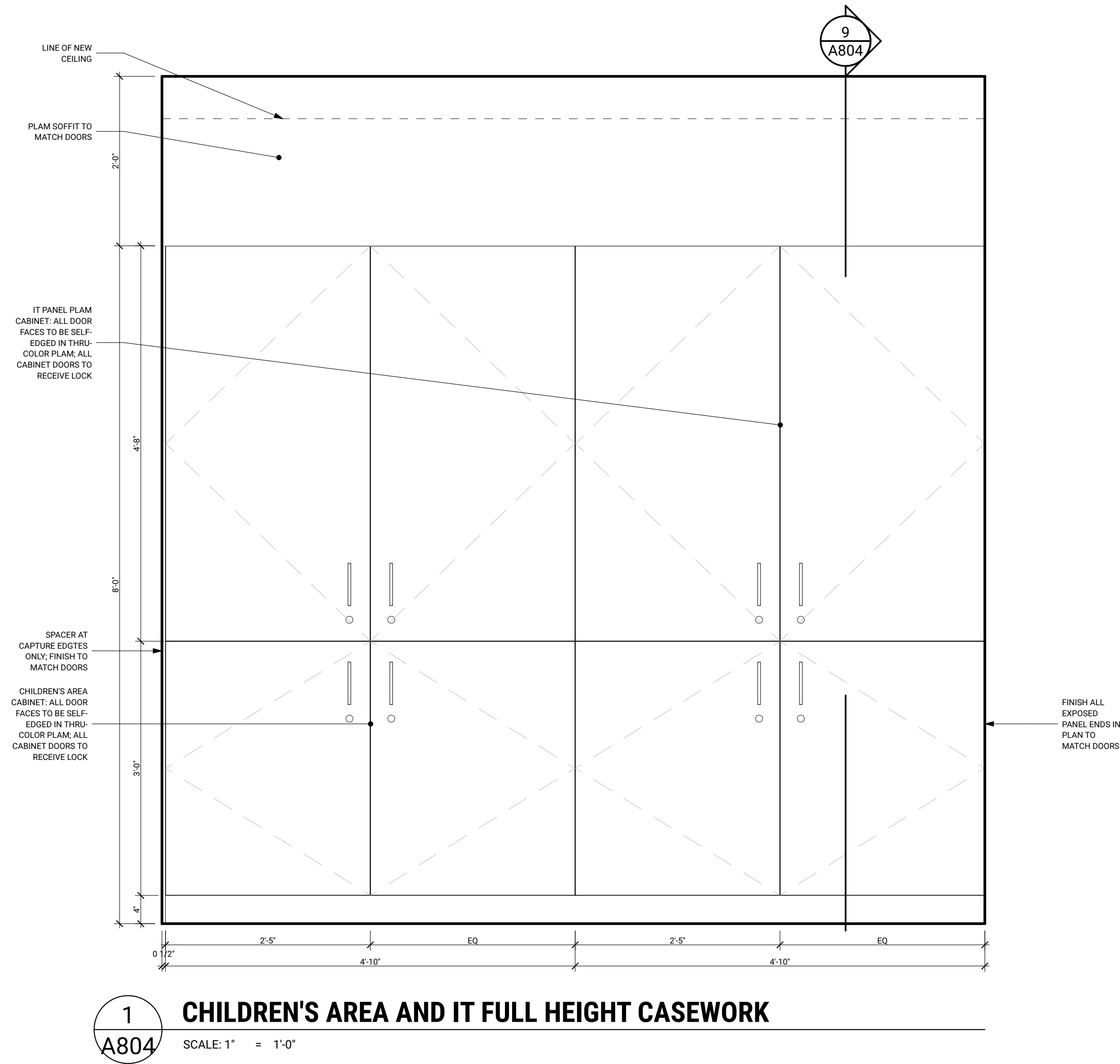
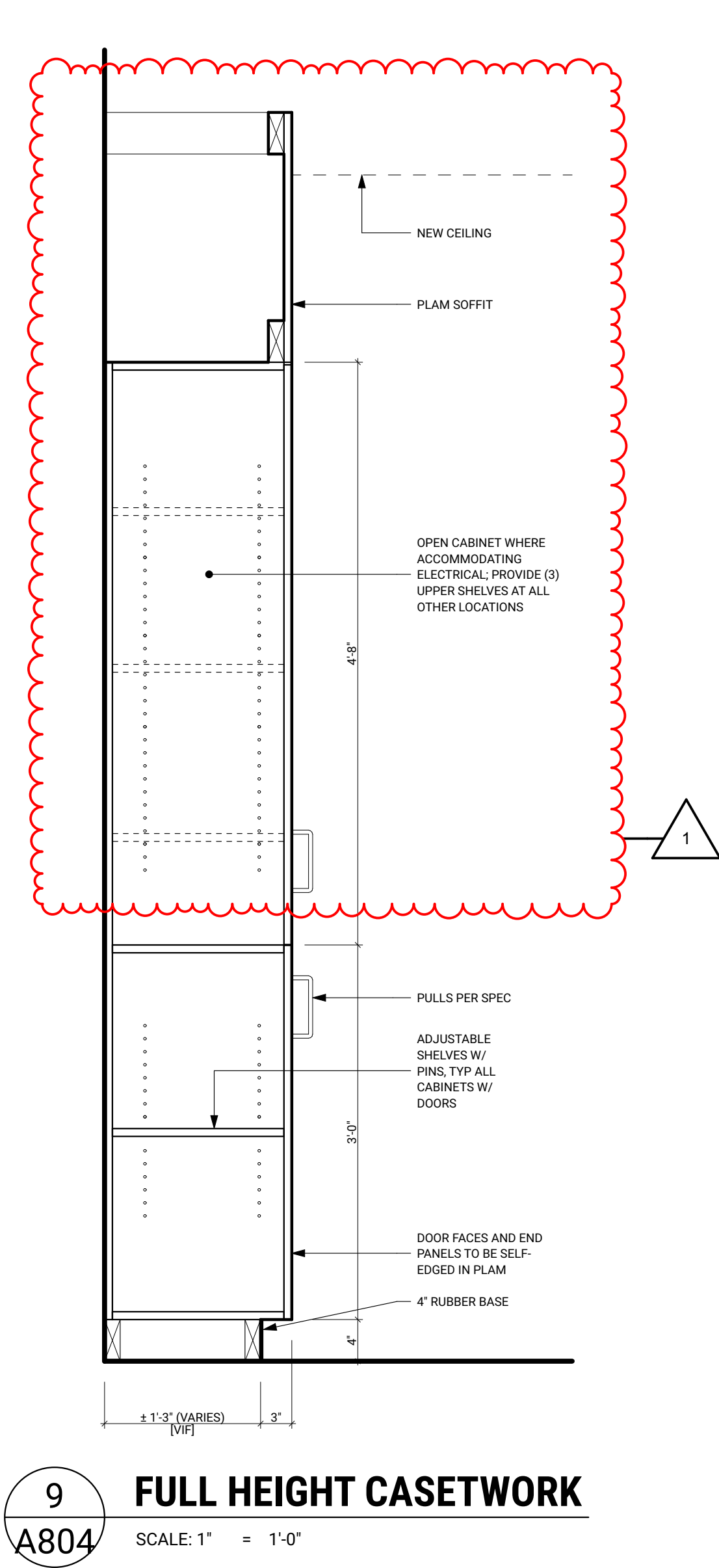
MATTHEW C. AALFS
STATE OF WASHINGTON

CASEWORK DETAILS

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Bid Set

A804



architecture
design
preservation

159 western avenue west, suite 486
seattle, washington 98119
office 206 775-8668

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PROJECT
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REVISION DATE NAME

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FINISH SCHEDULE

08/04/2023

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| Surfaces | | | | | | | |
|----------|------------------------|-----------|------------|-------------------|----------|----------------------------|---|
| Mark | Type | MFR | Collection | Name/ Color | Code | Notes | Location(s) |
| PLAM-1 | Plastic Laminate | Wilsonart | Traceless | Sesame Velvet Elm | 15603-31 | Traceless Finish | Main, Level 1: • Teen Area • Maker Space |
| PLAM-2 | Plastic Laminate | Wilsonart | Traceless | Acom Velvet Elm | 15602-31 | Traceless Finish | Main, Level 1 • Tacoma's Living Room • Service Desks Main, Level 2 • Common Kitchen • Library Staff Break Area |
| PLAM-3 | Plastic Laminate | Wilsonart | Premium | Vapor Strands | 4939K-18 | Linearity Finish w/ Aeon | Main, Level 1 • Tacoma's Living Room • Service Desks |
| PLAM-4 | Plastic Laminate | Wilsonart | Standard | Misted Zephyr | 4843-60 | Matte Finish | Main, Level 1: • Teen Area • Maker Space |
| PLAM-5 | Plastic Laminate | Wilsonart | Standard | Sheer Mesh | 4876-38 | Fine Velvet Texture Finish | Main, Level 2 • Common Kitchen • Library Staff Break Area |
| SSM-1 | Solid Surface Material | | | | | | |

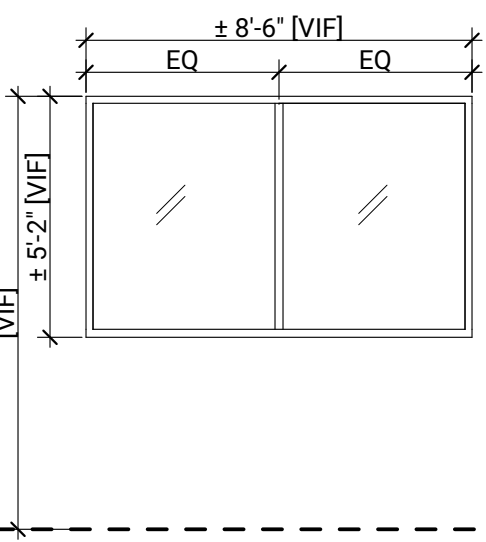
| Flooring | | | | | | | |
|----------|--------------------|-------------------------|------------|---------------------------|--------------|---|---|
| Mark | Type | MFR | Collection | Name/ Color | Code | Notes | Location(s) |
| CPT-1 | Carpet Tile | Miliken | ----- | Custom, Cyan | 01388206_001 | | Main, Level 1: • Tacoma's Living Room |
| CPT-2 | Carpet Tile | Miliken | ----- | Custom, Gold | 01388208_001 | | Main, Level 1 • Teen Area • Makerspace |
| CPT-3 | Carpet Tile | Miliken | ----- | Custom, Berry | 01383763_001 | | Main, Level 1 • Children's Area |
| CPT-4 | Carpet Tile | Miliken | Illume | Custom, Lines | 1382562 | | Main, Level 1: • Field Main, Level 2 Carnegie, Level 1 |
| CPT-5 | Broadloom Carpet | Philadelphia Commercial | Engrain | 00715 Foundational | 54922 | | Carnegie, Stairs |
| WOM | Walk-off Mat | Miliken | Obex | Loop/ Stack/ Gray | SKL153-133 | | Main, Level 1: Vestibule Main, Level 2: Tenant Space [205] (Partial) Carnegie, Level 1: base of Stairs |
| RF-1 | Resilient Flooring | Mohawk Group | Medella | Fleck C2061, Chateau Gray | 84620 | Healthy Environments Collection Homogenous Resilient Sheet 2mm Thickness Glue down | Main, Level 1 • Equipment Storage [113] Main Level 2 • Tenant Space [202] • Clean/ Utility [219] • Room [225] • Common Kitchen [209] (Partial) • Library Staff Breakroom [230] (Partial) |

| Ceillings | | | | | | | |
|-----------|-----------------------|----------|------------|-------------|------|---------------------------------|-------------------------------------|
| Mark | Type | MFR | Collection | Name/ Color | Code | Notes | Location(s) |
| AF-1 | Acoustic Felt Cloud | Acoufelt | ----- | Denim | DE09 | 1" Thickness | Main, Level 1: Tacoma's Living Room |
| AF-2 | Acoustic Felt Cloud | Acoufelt | ----- | Platinum | PL04 | 1" Thickness | Main, Level 1: Tacoma's Living Room |
| AF-3 | Acoustic Felt Cloud | Acoufelt | ----- | Grey | GR02 | 1" Thickness | Main, Level 1: Tacoma's Living Room |
| AF-4 | Acoustic Felt Baffles | Acoufelt | ----- | Popcorn | PO26 | 1" Thickness, 12" Height | Main, Level 1: Makerspace |
| AF-5 | Acoustic Felt Baffles | Acoufelt | ----- | Ivory | IV11 | 1" Thickness, 12" Height | Main, Level 1: Makerspace |
| AF-6 | Acoustic Felt Baffles | Acoufelt | ----- | Almond | AL55 | 1" Thickness, 12" Height | Main, Level 1: Makerspace |
| AF-7 | Acoustic Felt Cloud | Acoufelt | ----- | Peacock | PE20 | 1" Thickness | Main, Level 1: Children's Area |
| AF-8 | Acoustic Felt Cloud | Acoufelt | ----- | Sea Salt | SE57 | 1" Thickness | Main, Level 1: Children's Area |
| AF-9 | Acoustic Felt Cloud | Acoufelt | ----- | Azure | AZ05 | 1" Thickness 4" Thick Border | Main, Level 1: Children's Area |

| Paint | | | | | | | |
|-------|-------------------------------|----------------|------------|-------------|------|-----------|--|
| Mark | Type | MFR | Collection | Name/ Color | Code | Notes | Location(s) |
| PT-1 | Wall Paint, Accent | Benjamin Moore | ----- | | | Matte | Main, Level 1 • Tacoma's Living Room • Study Rooms |
| PT-2 | Wall Paint, Accent | Benjamin Moore | ----- | | | Matte | Main, Level 1 • Teen Area (Outside Makerspace) |
| PT-3 | Wall Paint, Accent | Benjamin Moore | ----- | | | Matte | Main, Level 1 • Children's Area |
| PT-4 | Wall Paint, Building Standard | Benjamin Moore | ----- | | | Matte | Main, Level 1 Main, Level 2 Carnegie, Level 1 |
| PT-5 | Paint, AES Star | Benjamin Moore | ----- | | | Egg Shell | Main, Communication Stair |
| PT-6 | Wall Paint, Epoxy | Benjamin Moore | ----- | | | Egg Shell | All New Restrooms |
| PT-7 | Ceiling Paint | Benjamin Moore | ----- | | | Matte | All GWB Ceilings |
| PT-8 | Paint, Door Frames | Benjamin Moore | ----- | | | Egg Shell | All Hollow Metal Door Frames |

| Floor Base | | | | | | | |
|------------|---------------|--------------|------------|---------------------------|-------|---|--|
| Mark | Type | MFR | Collection | Name/ Color | Code | Notes | Location(s) |
| RB-1 | Rubber Base | | | | | | |
| INT | Integral Cove | Mohawk Group | Medella | Fleck C2061, Chateau Gray | 84620 | Healthy Environments Collection Homogenous Resilient Sheet 2mm Thickness Glue down | Main Level 2 • Tenant Space [202] • Clean/ Utility [219] • Room [225] |

| FINISH SCHEDULE | | | | | | | | | | | |
|------------------------|-------------------------|-------------------|---------------|---------------|---------------|---------------|---------------|---------------|-------------------|---------------------|--|
| STORY | ROOM NUMBER | ROOM NAME | FLOOR | BASE | WALL FINISH | | | | CEILING | | COMMENTS |
| | | | | | north | east | south | west | material | finish | |
| MAIN BUILDING, LEVEL 1 | | | | | | | | | | | |
| | 100 | COLLECTION | CPT-1, CPT-4 | RB-1 | PT-4 | PT-1, PT-3 | PT-4 | PT-4, PT-2 | (E) ACT | (E) TO REMAIN | |
| | 100A | VESTIBULE | WOM | RB-1 | PT-4 | PT-4 | PT-4 | PT-4 | (E) TO REMAIN | PT-7 | |
| | 101 | POINT OF SVC. | CPT-4 | RB-1 | N/A | N/A | N/A | N/A | (E) GWB | PT-7 | |
| | 102 | STUDY | CPT-1 | RB-1 | PT-1 | PT-4 | PT-4 | PT-4 | (E) ACT | (E) TO REMAIN | |
| | 103 | STUDY | CPT-1 | RB-1 | PT-1 | PT-4 | PT-4 | PT-4 | (E) ACT | (E) TO REMAIN | <div>1</div> INSTALL ACROVYN WAINSCOT ON ALL 4 WALLS; HEIGHT PER INTERIOR ELEVATION |
| | 104 | STAFF WORKROOM | CPT-4 | RB-1 | PT-4 | PT-4 | PT-4 | PT-4 | (E) ACT | (E) TO REMAIN | |
| | 105 | OFFICE | CPT-4 | CT-1 | PT-4 | PT-4 | PT-4 | PT-4 | (E) ACT | (E) TO REMAIN | |
| | 106 | OFFICE | CPT-4 | RB-1 | PT-4 | PT-4 | PT-4 | PT-4 | (E) ACT | (E) TO REMAIN | |
| | 107 | ADA RR | CT-1 | CT-2 | PT-6 | CT-2 | CT-2 | PT-6 | GWB | PT-7 | |
| | 108 | ADA RR | CT-1 | CT-2 | PT-6 | PT-6 | CT-2 | CT-2 | GWB | PT-7 | |
| | 109 | ADA RR | CT-1 | CT-2 | PT-6 | PT-6, CT-2 | CT-2 | CT-2 | GWB | PT-7 | |
| | 110 | MAKER SPACE | CPT-2 | RB-1 | PT-4 | PT-4 | PT-4 | PT-4 | ACOUSTIC FELT | AFB-1, AFB-2, AFB-3 | |
| | 111 | MEMORY LAB | CPT-2 | RB-1 | PT-4 | PT-4 | PT-4 | PT-4 | (E) ACT | (E) TO REMAIN | |
| | 112 | CONTROL | CPT-2 | RB-1 | PT-4 | PT-4 | PT-4 | PT-4 | (E) ACT | (E) TO REMAIN | |
| | 113 | EQUIP. STOR | RF-1 | RB-1 | PT-4 | PT-4 | PT-4 | PT-4 | (E) ACT | (E) TO REMAIN | |
| | 114 | STUDIO | CPT-2 | RB-1 | PT-4 | PT-4 | PT-4 | PT-4 | (E) ACT | (E) TO REMAIN | <div>1</div> INSTALL ACROVYN WAINSCOT; SEE INTERIOR ELEVATIONS FOR EXTENT |
| | 115 | PAGING STATION | CPT-4 | RB-1 | PT-4 | PT-4 | PT-4 | PT-4 | (E) ACT | (E) TO REMAIN | |
| 116 | ADA RR | CT-1 | CT-2 | PT-6 | PT-6, CT-2 | CT-2 | PT-6 | GWB | PT-7 | | |
| 117 | ADA RR | CT-1 | CT-2 | PT-6 | PT-6 | CT-2 | CT-2 | GWB | PT-7 | | |
| CARNEGIE, LEVEL 1 | | | | | | | | | | | |
| | C100 | STAIRS | CPT-5 | N/A | PT-4 | PT-4 | PT-4 | PT-4 | (E) TO REMAIN | (E) TO REMAIN | |
| | C101 | HANDFORTH GALLERY | CPT-4 | RB-1 | PT-4 | PT-4 | PT-4 | PT-4 | (E) ACT | (E) TO REMAIN | |
| | C102 | MALE RR | (E) TO REMAIN | (E) TO REMAIN | (E) TO REMAIN | (E) TO REMAIN | (E) TO REMAIN | (E) TO REMAIN | (E) TO REMAIN | (E) TO REMAIN | |
| | C103 | FEMALE RR | (E) TO REMAIN | (E) TO REMAIN | (E) TO REMAIN | (E) TO REMAIN | (E) TO REMAIN | (E) TO REMAIN | (E) TO REMAIN | (E) TO REMAIN | |
| | C105 | OFFICE | CPT-4 | RB-1 | PT-4 | PT-4 | PT-4 | PT-4 | (E) GWB | PT-7 | |
| | C106 | BOARD ROOM | CPT-4 | RB-1 | PT-4 | PT-4 | PT-4 | PT-4 | (E) TO REMAIN | (E) TO REMAIN | |
| | C109 | COMMUNITY ROOM | CPT-4 | RB-1 | PT-4 | PT-4 | PT-4 | PT-4 | (E) TO REMAIN | (E) TO REMAIN | |
| C116 | STORAGE | CPT-4 | RB-1 | PT-4 | PT-4 | PT-4 | PT-4 | (E) ACT | (E) TO REMAIN | | |
| MAIN BUILDING, LEVEL 2 | | | | | | | | | | | |
| | 200 | CIRCULATION | CPT-4 | RB-1 | PT-4 | PT-4 | PT-4 | PT-4 | (E) ACT | (E) TO REMAIN | |
| | 201 | TENANT SPACE | CPT-4 | RB-1 | PT-4 | PT-4 | PT-4 | PT-4 | (E) ACT | (E) TO REMAIN | |
| | 202 | TENANT SPACE | RF-1 | INT | PT-4 | PT-4 | PT-4 | PT-4 | OPEN TO STRUCTURE | PT-7 | |
| | 203 | TENANT SPACE | CPT-4 | RB-1 | PT-4 | PT-4 | PT-4 | PT-4 | (E) ACT | (E) TO REMAIN | |
| | 204 | ELEC. | RF-1 | RB-1 | PT-4 | PT-4 | PT-4 | PT-4 | (E) ACT | (E) TO REMAIN | |
| | 205 | TENANT SPACE | CPT-4 | RB-1 | PT-4 | PT-4 | PT-4 | PT-4 | (E) ACT | (E) TO REMAIN | |
| | 206 | TENANT SPACE | CPT-4 | RB-1 | PT-4 | PT-4 | PT-4 | PT-4 | (E) ACT | (E) TO REMAIN | |
| | 207 | TENANT SPACE | CPT-4 | RB-1 | PT-4 | PT-4 | PT-4 | PT-4 | (E) ACT | (E) TO REMAIN | |
| | 208 | TENANT SPACE | CPT-4 | RB-1 | PT-4 | PT-4 | PT-4 | PT-4 | (E) ACT | (E) TO REMAIN | |
| | 209 | COMMON KITCHEN | CPT-4, RF-1 | RB-1 | PT-4 | PT-4 | PT-4 | PT-4 | (E) ACT | (E) TO REMAIN | |
| | 210 | RESTROOM CORE | CT-1 | CT-2 | PT-6 | PT-6 | PT-6 | PT-6 | (E) ACT | (E) TO REMAIN | |
| | 211 | ADA RR | CT-1 | CT-2 | PT-6 | PT-6 | CT-2 | CT-2 | GWB | PT-7 | |
| | 212 | RR | CT-1 | CT-2 | PT-6 | CT-2 | CT-2 | PT-6 | GWB | PT-7 | |
| | 213 | ADA RR | CT-1 | CT-2 | CT-2 | PT-6 | PT-6 | CT-2 | GWB | PT-7 | |
| | 214 | RR | CT-1 | CT-2 | CT-2 | CT-2 | PT-6 | PT-6 | GWB | PT-7 | |
| | 215 | ADA RR | CT-1 | CT-2 | PT-6 | PT-6 | CT-2 | CT-2 | GWB | PT-7 | |
| | 216 | ADA RR | CT-1 | CT-2 | PT-6 | CT-2 | CT-2 | PT-6 | GWB | PT-7 | |
| | 217 | STORAGE | CPT-4 | RB-1 | PT-4 | PT-4 | PT-4 | PT-4 | (E) ACT | (E) TO REMAIN | <div>1</div> INSTALL FRP WAINSCOT TO 5'-0" ABOVE FINISH FLOOR ON ALL WALLS; SEE INTERIOR ELEVATION |
| | 218 | STORAGE | CPT-4 | RB-1 | PT-4 | PT-4 | PT-4 | PT-4 | (E) ACT | (E) TO REMAIN | |
| | 219 | CLEAN/ UTILITY | RF-1 | INT | PT-6 | PT-6 | PT-6 | PT-6 | (E) ACT | (E) TO REMAIN | |
| | 221 | MIXING CHAMBER | CPT-4 | RB-1 | PT-4 | PT-4 | PT-4 | PT-4 | (E) ACT, (E) GWB | (E) TO REMAIN, PT-7 | |
| | 222 | MEETING | CPT-4 | RB-1 | PT-4 | PT-4 | PT-4 | PT-4 | (E) ACT | (E) TO REMAIN | |
| | 223 | MEETING | CPT-4 | RB-1 | PT-4 | PT-4 | PT-4 | PT-4 | (E) ACT | (E) TO REMAIN | |
| 224 | MEETING | CPT-4 | RB-1 | PT-4 | PT-4 | PT-4 | PT-4 | (E) ACT | (E) TO REMAIN | | |
| 225 | ROOM | RF-1 | INT | PT-4 | PT-4 | PT-4 | PT-4 | (E) ACT | (E) TO REMAIN | | |
| 230 | LIBRARY STAFF BREAKROOM | CPT-4, RF-1 | RB-1 | PT-4 | PT-4 | PT-4 | PT-4 | (E) ACT | (E) TO REMAIN | | |
| 230A | LOCKER | CT-1 | CT-2 | PT-4 | PT-4 | PT-4 | PT-4 | (E) ACT | (E) TO REMAIN | | |
| 231 | ADA RR | CT-1 | CT-2 | CT-2 | CT-2 | PT-6 | PT-6 | GWB | PT-7 | | |
| CARNEGIE, LEVEL 2 | | | | | | | | | | | |
| | C200 | STAIRS | CPT-5 | NA | PT-4 | PT-4 | PT-4 | PT-4 | (E) TO REMAIN | (E) TO REMAIN | |

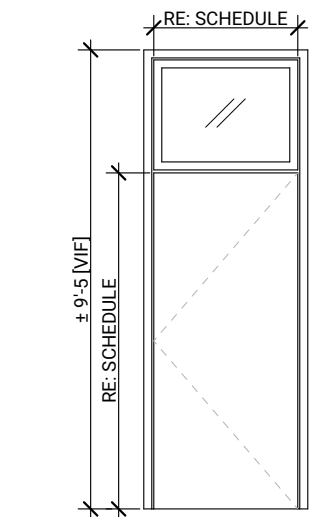
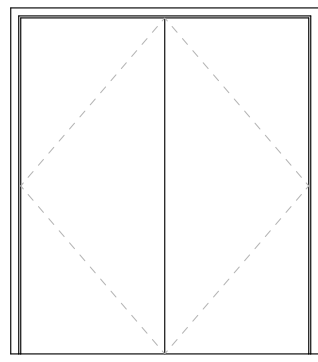
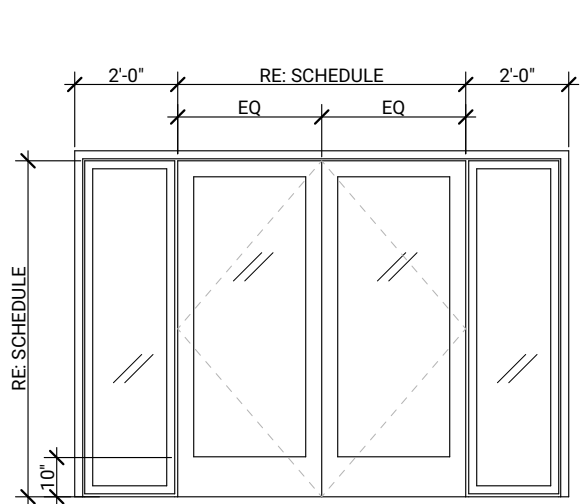
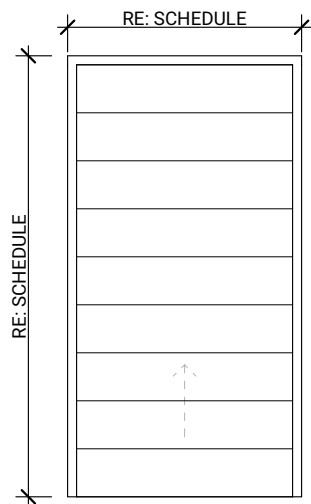
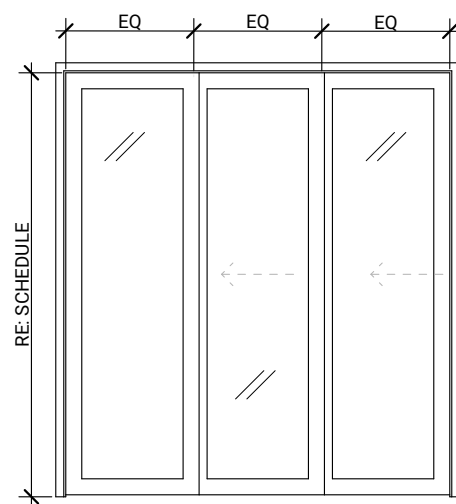
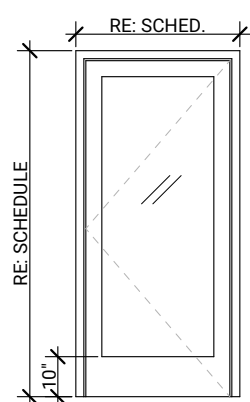
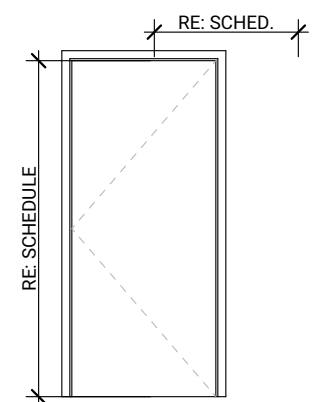
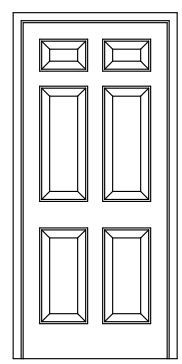
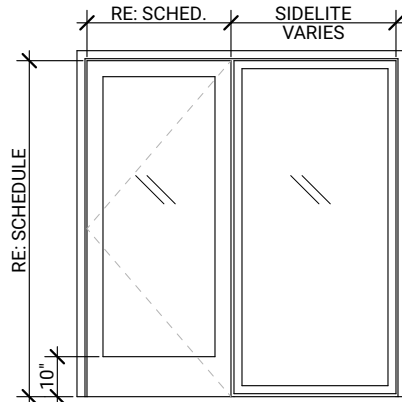
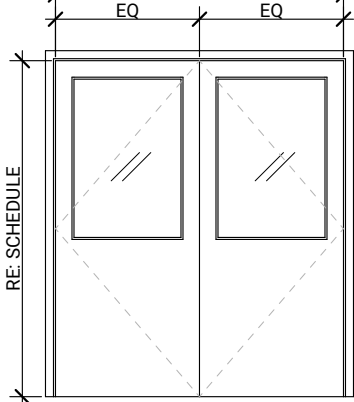
| | | |
|---------------------------|--|------------------|
| VIEW FROM OPENING SIDE |  | |
| | ID | 1 |
| | TYPE | FIXED - EXTERIOR |
| | QUANTITY | 1 |
| | U-VALUE | 0.38 |
| SHGC | 0.38 | |

3

A910

EXTERIOR WINDOW SCHEDULE

SCALE: 1" = 1'-0"

VIEW FROM
OPENING SIDETYPE
COMMENTS
QUANTITYK
FLUSH PANEL DOOR W/ TRANSOM
1L
FLUSH PANEL DOUBLE DOOR
7VIEW FROM
OPENING SIDETYPE
COMMENTS
QUANTITYF
FULL HEIGHT GLASS LITE W/ SIDELITES
2G
OVERHEAD ROLLING DOOR
2H
3-PANEL INTERIOR ALUM. SLIDING DOORS
2VIEW FROM
OPENING SIDETYPE
COMMENTS
QUANTITYA
FULL HEIGHT GLASS LITE
31B
FLUSH PANEL
6C
6-PANEL SALVAGED DOOR
1D
FULL HEIGHT GLASS LITE W/ SIDELITE
7E
DOUBLE PANEL W/ HALF GLASS LIT
1

| DOOR HARDWARE GROUPS | |
|---|---|
| A EXIT DOORS | EGRESS HARDWARE: Von Duprin Model 9800/9900 Series w/ fluid hydraulic damper HINGES: Pemko continuous gear hinges CLOSER: LCN 5034 H x ST or sim, overhead concealed type |
| B INTERIOR DOORS | HARDWARE: Lever-type with classroom lock HINGES: five knuckle heavy weight full mortise, McKinney T4A3786 or sim CLOSER: LCN 5010 series or sim concealed |
| C DOORS REQUIRING ACCESS CONTROL | HARDWARE: card access & electric strike |
| D INTERIOR DOOR | HARDWARE: keyed lock |
| E INTERIOR DOOR | HARDWARE (retrofit): flush bolts & mortise locks |
| F INTERIOR DOOR | HARDWARE: Lever-type with classroom lock HINGES: five knuckle heavy weight full mortise, McKinney T4A3786 or sim LOCK: occupancy indicator |
| G INTERIOR DOOR | HARDWARE |
| H INTERIOR DOOR | HARDWARE: Lever-type with classroom lock HINGES: five knuckle heavy weight full mortise, McKinney T4A3786 or sim LOCK: non-smart punch code w/ deadbolt, occupancy indicator and closer |

DOOR HARDWARE GENERAL NOTES

FOR ALL DOORS

See specification for basis of design manufacturers and grades for all door hardware. Each door to have the following hardware at a minimum:

- Commercial Duty Door Closer
- Commercial Duty Exit Devices (conventional or electromechanical per plans)
Single doors may use rim devices; all double doors must use concealed vertical rods.
- Cylinder locks with library-specific keying
- Commercial Duty knuckle hinges
- Mechanical locks or electromechanical locks and strikes per plans
- Power Transfer Devices as required for keycard access
- Wall or floor mounted stops depending on location.
- Acoustic seal strips where doors are located in STC rated walls
- Lever handle: Corbin Russwin Museo Series "Georgia 102" or similar.

Specific elements required at specific doors are itemized in door hardware groups; manufacturers listed on this sheet are basis of design; contractor may propose an equal product by manufacturers listed in spec

DOOR SCHEDULE GENERAL NOTES

1. THE FORCE REQUIRED TO OPEN DOORS SHALL NOT EXCEED 8.5 POUNDS AT EXTERIOR DOORS AND 5 POUNDS AT INTERIOR DOORS.
2. LOCKSETS AND DOOR HANDLES SHALL HAVE LEVER OR PUSH BAR DEVICES TO PERMIT OPERATION WITHOUT GRASPING, PER WAC 1106.3.1
3. VERIFY ALL ROUGH OPENINGS
4. NEW DOORS TO MATCH EXISTING IN HEIGHT. CONTRACTOR TO VERIFY.

1

| | MARK | TYPE | PAIR | W | H | T | MATL | FIN | FRAME | | FIRE RATING | HW SET | EXTERIOR | U-VALUE: DOOR | U-VALUE: SIDELITE, TRANSOM | SHGC | REMARKS | |
|-------------------------|------------------------|------|-------|--------|--------|---------|--------------|----------|---------|----------|-------------|--------|----------|---------------|----------------------------|-------------------------|--|-------------------------|
| | | | | | | | | | MATL | FIN | | | | | | | | |
| MAIN BUILDING, BASEMENT | | | | | | | | | | | | | | | | | | |
| | B01 | | | 3'-0" | 7'-0" | 1 3/4" | - | | | | | C | | | | | (E) DOOR TO RECEIVE NEW CARD ACCESS HARDWARE | |
| MAIN BUILDING, LEVEL 1 | | | | | | | | | | | | | | | | | | |
| | 100 | H | | 10'-7" | 8'-10" | 1 3/4" | ALUM / GLASS | CLR ANOD | ALUM | CLR ANOD | | D | | | | | 3-PANEL SLIDING | |
| | 101A | | | 6'-0" | 7'-0" | 1 3/4" | - | | | | | E | | | | | | |
| | 102 | A | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | ALUM | CLR ANOD | | B | | | | | | |
| | 103 | A | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | ALUM | CLR ANOD | | B | | | | | | |
| | 104 | D | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | ALUM | CLR ANOD | | B, C | | | | | 2'-0"W SIDELITE | |
| | 105 | A | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | ALUM | CLR ANOD | | B, C | | | | | OPAQUE WHITE INTERLAYER | |
| | 106 | A | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | ALUM | CLR ANOD | | B, C | | | | | OPAQUE WHITE INTERLAYER | |
| | 107 | A | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | HM | PAINT | | F | | | | | OPAQUE WHITE INTERLAYER | |
| | 108 | A | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | HM | PAINT | | F | | | | | OPAQUE WHITE INTERLAYER | |
| | 109 | A | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | HM | PAINT | | F | | | | | | |
| | 110 | A | | 3'-6" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | ALUM | CLR ANOD | | B, C | | | | | | |
| | 111 | A | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | ALUM | CLR ANOD | | B | | | | | | |
| | 112 | B | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | ALUM | CLR ANOD | | F | | | | | | |
| | 113 | A | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | ALUM | CLR ANOD | | B, C | | | | | | |
| | 114 | B | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | ALUM | CLR ANOD | | F | | | | | | |
| | 115 | A | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | ALUM | CLR ANOD | | B, C | | | | | | |
| | 116 | A | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | HM | PAINT | | B, C | | | | | OPAQUE WHITE INTERLAYER | |
| 117 | A | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | HM | PAINT | | B, C | | | | | OPAQUE WHITE INTERLAYER | | |
| 120 | F | YES | | 6'-0" | 7'-0" | 1 3/4" | ALUM / GLASS | CLR ANOD | ALUM | CLR ANOD | | A | | | | | PANIC HARDWARE | |
| CARNEGIE, LEVEL 1 | | | | | | | | | | | | | | | | | | |
| | C106 | | | 3'-0" | 7'-0" | 1 3/4" | - | | | | | B | | | | | | |
| | C106A | C | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | STAIN | WOOD | STAIN | | B | | | | | RE-USE PANEL SALVAGED DURING DEMOLITION | |
| | C116B | L | YES | 6'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | HM | PAINT | | B, D | | | | | | |
| | C116C | L | YES | 6'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | HM | PAINT | | B, D | | | | | | |
| MAIN BUILDING, LEVEL 2 | | | | | | | | | | | | | | | | | | |
| | 200 | H | | 8'-0" | 8'-10" | 1 3/4" | ALUM / GLASS | CLR ANOD | ALUM | CLR ANOD | | D | | | | | 3-PANEL SLIDING | |
| | 201 | D | | 3'-6" | 7'-0" | 1 3/4" | ALUM / GLASS | CLR ANOD | ALUM | CLR ANOD | | A, D | YES | 0.4 | 0.38 | 0.61 | SWING DOOR w/ SIDELITE, INSULATED GLAZING | |
| | 201A | D | | 3'-6" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | ALUM | CLR ANOD | | B, D | | | | | 1'-9"W SIDELITE | |
| | 202 | B | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | HM | PAINT | | B, D | | | | | | |
| | 202A | K | | 3'-0" | 7'-0" | 1 3/4" | HM | PAINT | ALUM | CLR ANOD | | B | YES | 0.37 | 0.38 | 0.4 | SWING DOOR w/ TRANSOM, INSULATED GLAZING | |
| | 202B | G | | 4'-6" | 9'-0" | 1 3/4" | HM | PAINT | HM | PAINT | | G | YES | 0.31 | | | INSULATED OVERHEAD SECTIONAL DOOR | |
| | 202C | G | | 4'-6" | 7'-0" | 1 3/4" | HM | PAINT | HM | PAINT | | G | | | | | INTERIOR OVERHEAD SECTIONAL DOOR | |
| | 203 | A | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | ALUM | CLR ANOD | | B, D | | | | | | |
| | 204 | B | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | ALUM | CLR ANOD | | B, D | | | | | | |
| | 205 | A | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | ALUM | CLR ANOD | | B, D | | | | | | |
| | 206 | A | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | ALUM | CLR ANOD | | B, D | | | | | | |
| | 207 | A | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | ALUM | CLR ANOD | | B, D | | | | | | |
| | 208 | A | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | ALUM | CLR ANOD | | B, D | | | | | | |
| | 209 | D | | 3'-6" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | ALUM | CLR ANOD | | B, C | | | | | 2'-0"W SIDELITE | |
| | 211 | A | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | HM | PAINT | | H | | | | | OPAQUE WHITE INTERLAYER | |
| | 212 | A | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | HM | PAINT | | H | | | | | OPAQUE WHITE INTERLAYER | |
| | 213 | A | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | HM | PAINT | | H | | | | | OPAQUE WHITE INTERLAYER | |
| | 214 | A | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | HM | PAINT | | H | | | | | OPAQUE WHITE INTERLAYER | |
| | 215 | A | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | HM | PAINT | | H | | | | | OPAQUE WHITE INTERLAYER | |
| | 216 | A | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | HM | PAINT | | H | | | | | OPAQUE WHITE INTERLAYER | |
| | 217A | L | YES | | 6'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | HM | PAINT | | B, D | | | | | |
| | 217B | L | YES | | 6'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | HM | PAINT | | B, D | | | | | |
| | 218A | L | YES | | 6'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | HM | PAINT | | B, D | | | | | |
| | 218B | L | YES | | 6'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | HM | PAINT | | B, D | | | | | |
| | 218C | L | YES | | 6'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | HM | PAINT | | B, D | | | | | |
| | 219A | B | | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | HM | PAINT | | B, D | | | | | |
| | 219B | B | | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | HM | PAINT | | B, D | | | | | |
| | 220 | F | YES | | 6'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | HM | PAINT | | A | | | | | OPAQUE WHITE INTERLAYER |
| | 222 | D | | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | ALUM | CLR ANOD | | B | | | | | 3'-6"W SIDELITE |
| | 223 | D | | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | ALUM | CLR ANOD | | B | | | | | 3'-6"W SIDELITE |
| | 224 | D | | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | ALUM | CLR ANOD | | B | | | | | 3'-6"W SIDELITE |
| | MAIN BUILDING, LEVEL 3 | 225 | | | 6'-0" | 7'-0" | 1 3/4" | - | | | | | A | | | | | |
| | | 230 | E | YES | | 6'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | HM | PAINT | B | | | | | |
| 231 | | A | | | 3'-0" | 7'-0" | 1 3/4" | SC WOOD | CLEAR | HM | PAINT | F | | | | | OPAQUE WHITE INTERLAYER | |
| CARNEGIE, ROOF | | | | | | | | | | | | | | | | | | |
| | 301 | | | 3'-0" | 7'-0" | 1 3/4" | - | | | | | C | | | | | (E) DOOR TO RECEIVE NEW CARD ACCESS HARDWARE | |

2

A910

DOOR TYPES

SCALE: 1" = 1'-0"

1

A910

DOOR SCHEDULE

SCALE: 1" = 1'-0"

architecture
design
preservation159 western avenue west, suite 486
seattle, washington 98119
office 206 775-8668

www.buildingwork.design

PROJECT

Tacoma Public Library
Main Branch Renovation

LOCATION

1102 Tacoma Ave S
Tacoma WA 98402

PREPARED FOR

Tacoma Public
Library

REVISION DATE NAME

1 9/25/23 ADDENDUM 2

ARCHITECT STAMP

DOOR AND EXTERIOR
WINDOW SCHEDULE

08/04/2023

Bid Set

A910

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PROJECT
**Tacoma Public Library
Main Branch**

LOCATION
**1102 Tacoma Ave S
Tacoma WA 98402**

PREPARED FOR
**Tacoma Public
Library**

REVISION DATE NAME

Addendum 2 9/25/23

PROFESSIONAL STAMP



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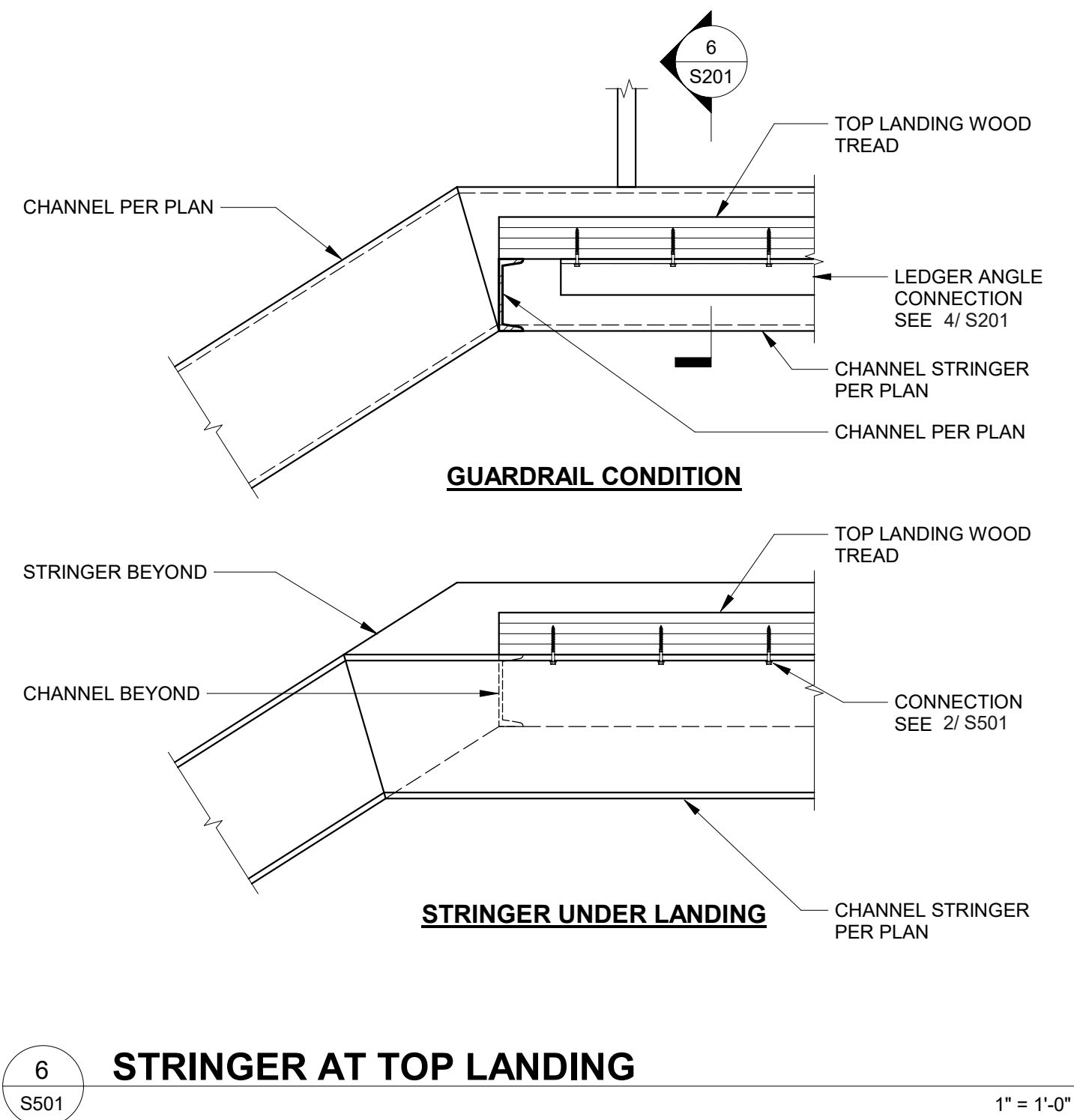
STEEL FRAMING
DETAILS

08/04/2023

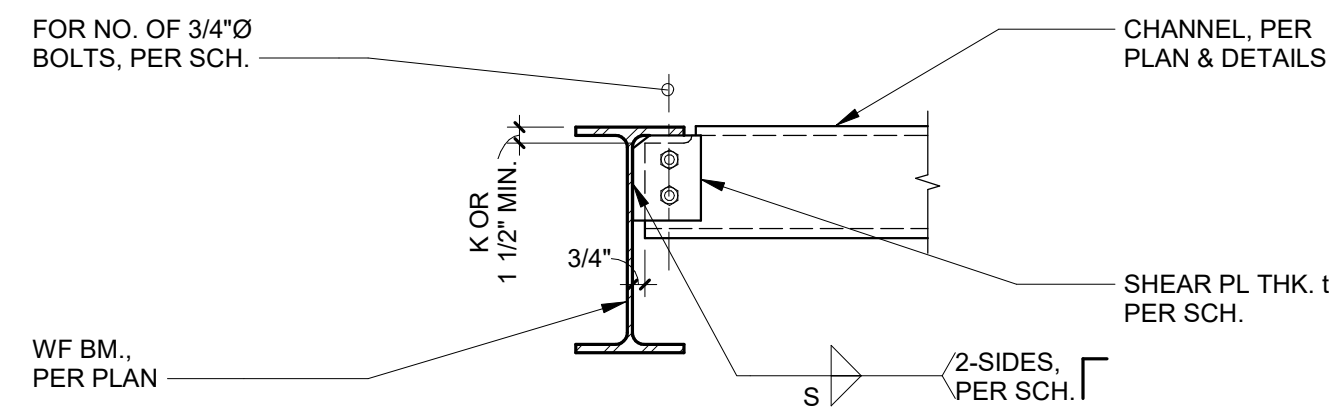
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S501

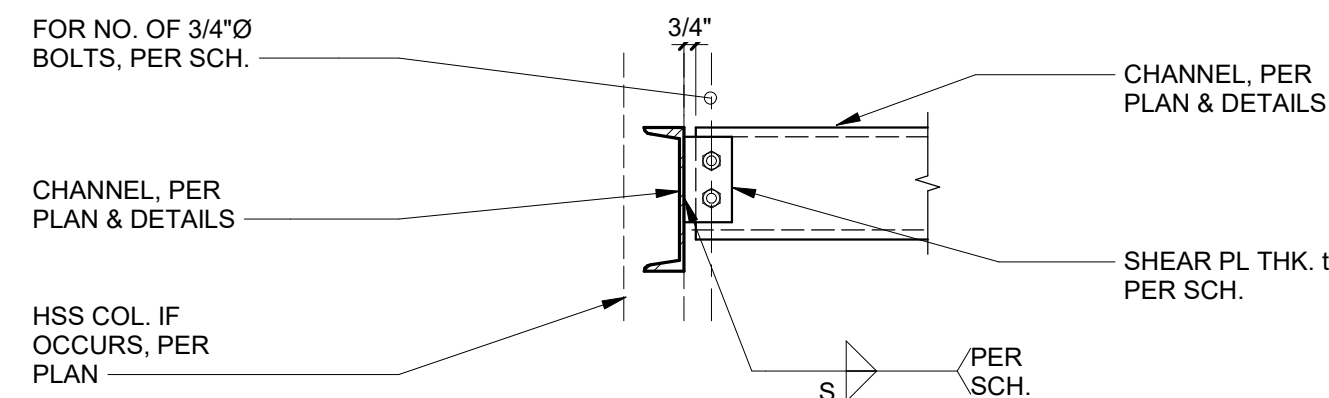
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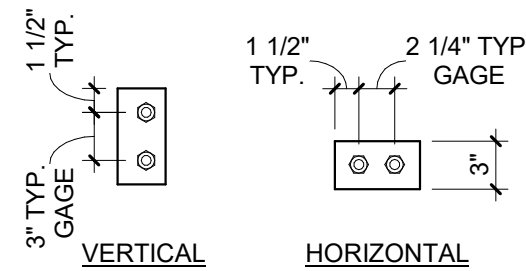
6 S501 **STRINGER AT TOP LANDING** 1" = 1'-0"



AT WF BEAM



AT CHANNEL OR HSS COL.

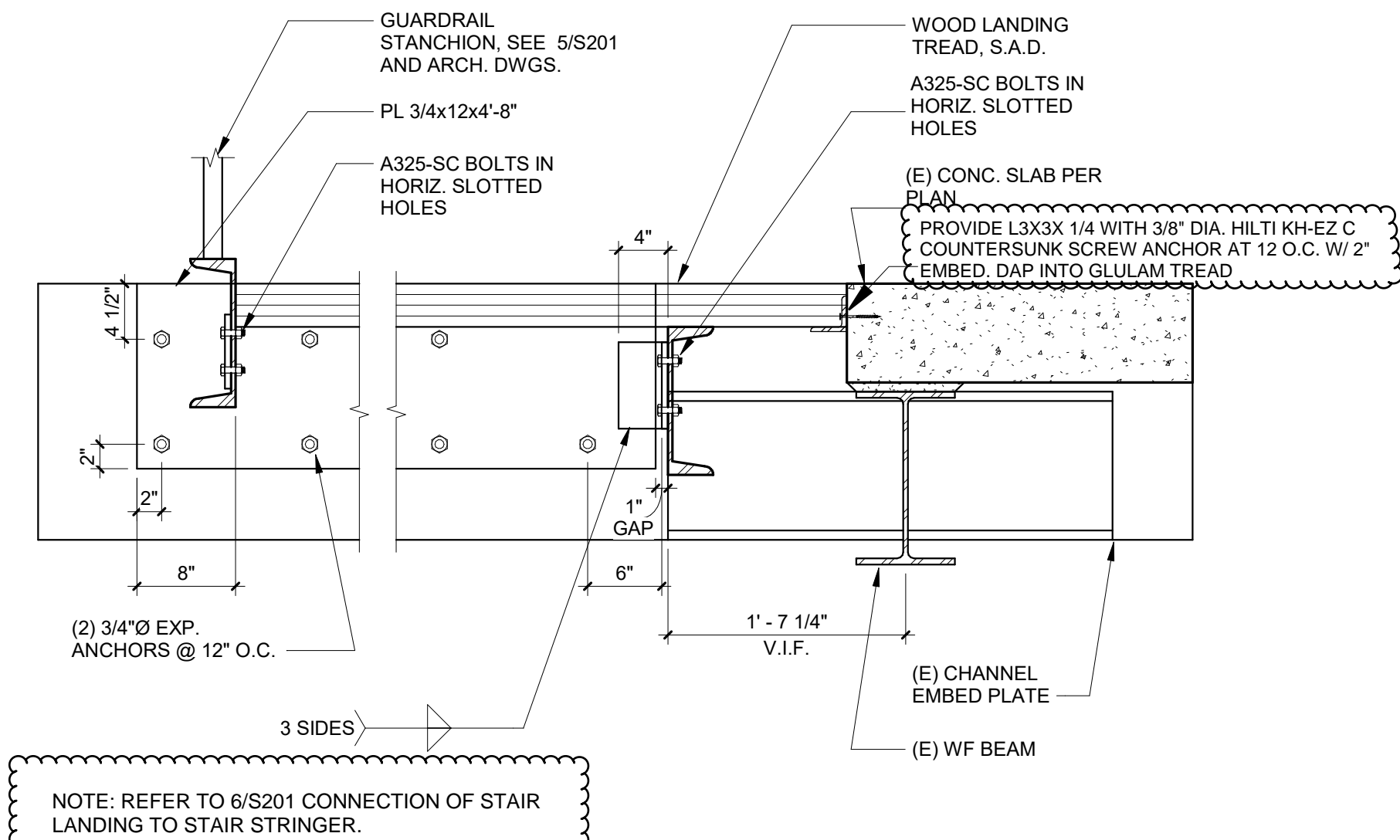


SHEAR PL ORIENTATION

| CHANNEL CONNECTION SCHEDULE | | | | |
|-----------------------------|------------------|----------------------|-----------------|-------------------|
| C OR MC CHANNEL | # OF 3/4"Ø BOLTS | SHEAR PL THICKNESS t | SHEAR PL WELD S | PLATE ORIENTATION |
| 6x | 2 | 3/8" | 3/16" | HORIZONTAL |
| 10x | 3 | 3/8" | 3/16" | VERTICAL |
| 12x | 3 | 3/8" | 3/16" | VERTICAL |

- NOTES:**
- ALL BOLT SPACING, EDGE DISTANCES & END DISTANCES NOT SHOWN SHALL COMPLY W/ AISC REQUIREMENTS.
 - SHEAR TAB BOLTS MAY BE REPLACED W/ 3-SIDED FILLET WELDS WITH WELD SIZE "S".

4 S501 **TYP. CHANNEL CONNECTION SCHEDULE** 1" = 1'-0"

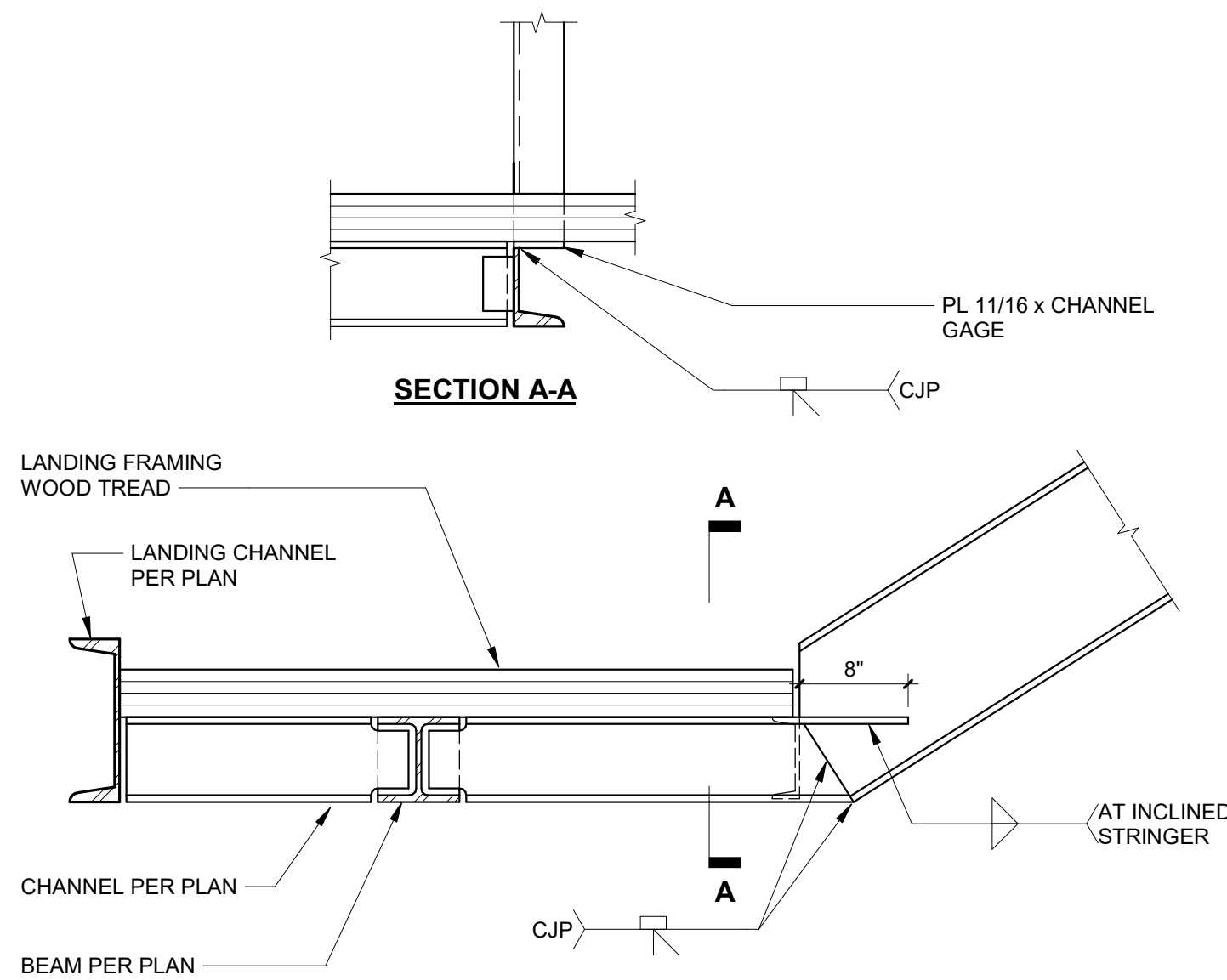


2 S501 **STRINGER CONNECTION AT LEVEL 02** 1" = 1'-0"

| SHEAR PLATE CONNECTION SCHEDULE | | | |
|----------------------------------|---|-----------------------------|----------------------|
| NOMINAL SIZE OF SUPPORTED MEMBER | # OF 3/4"Ø A325 GROUP A BOLTS, SEE NOTE 1 | SHEAR PL t (IN), SEE NOTE 2 | SHEAR PL WELD S (IN) |
| W6x | 2 | 1/4 | 3/16 |
| W12x | 3 | 1/4 | 3/16 |

- NOTES:**
- GROUP A AS DEFINED IN SECTION 3.1 OF THE AISC SPECIFICATION.
 - PLATE GRADE ASSUMED TO BE ASTM A572 GR. 50 KSI.
 - BEAMS AND SHEAR PLATES SHALL HAVE STANDARD (STD) HOLES UNLESS NOTED OTHERWISE. AT CONTRACTOR'S OPTION, SHORT-SLOTTED HOLES MAY BE PROVIDED IN THE SHEAR PLATES.
 - BOLTS AT BEAM TO COLUMN CONNECTIONS SHALL BE SLIP CRITICAL (SC). BOLTS AT BEAM TO BEAM CONNECTIONS MAY BE SNUG TIGHT UNLESS NOTED OTHERWISE.

1 S501 **TYP. SHEAR PLATE BEAM CONNECTION SCHEDULE** N.T.S.



7 S501 **INTERIOR STRINGER TO LANDING SECTION** 1" = 1'-0"

GENERAL NOTES:

1.

ELECTRICAL REQUIREMENTS ARE NOT LIMITED TO ELECTRICAL DRAWINGS AND SPECIFICATIONS. THERE IS ADDITIONAL ELECTRICAL WORK REQUIRED TO BE INCLUDED IN THE BID, INDICATED ON ARCHITECTURAL AND MECHANICAL DRAWINGS. ADDITIONAL ELECTRICAL WORK REQUIRED IN THE BID IS ALSO LOCATED IN THE SPECIFICATIONS. CONTRACTOR SHALL REVIEW ALL ARCHITECTURAL AND MECHANICAL SPECIFICATIONS FOR ADDITIONAL ELECTRICAL INFORMATION AND INCLUDE COSTS FOR THIS WORK IN THE BID.
2.

CONTRACTOR SHALL INCLUDE IN HIS BID LIGHTING CONTROL COMMISSIONING COSTS. CONTRACTOR SHALL PROVIDE THE OWNER A COMPLETE REPORT OF TEST PROCEDURES AND RESULTS INDICATING ALL LIGHTING CONTROLS HAVE BEEN TESTED, ADJUSTED AND OPERATE IN ACCORDANCE WITH APPROVED PLANS AND SPECIFICATIONS AND THE WASHINGTON STATE NONRESIDENTIAL ENERGY CODE, SECTION C408. CONTRACTOR SHALL PROVIDE A SPREAD SHEET INDICATING ROOM NUMBER, TYPE OF CONTROL (OCCUPANCY SENSOR, LOW VOLTAGE, ETC.), VERIFICATION OF PROPER WORKING ORDER, AND ADJUSTMENTS MADE.
3.

CONTRACTOR SHALL CONCEAL CONDUIT WHEREVER POSSIBLE. CONTRACTOR SHALL SUBMIT TO ARCHITECT FOR REVIEW AND APPROVAL, ALL ROUTINGS OF ANY EXPOSED CONDUIT PRIOR TO ROUGH-IN. NO EXPOSED CONDUIT SHALL BE INSTALLED UNTIL APPROVAL IS PROVIDED IN WRITING FROM THE ARCHITECT. ALL EXPOSED CONDUIT SHALL BE ROUTED IN A NEAT AND WORKMANSHIP LIKE MANNER.
4.

CONTRACTOR SHALL PROVIDE A HOT-WIRE OF THE SAME CIRCUIT FOR ALL LIGHT FIXTURES WITH BATTERY PACKS, SO THAT THE BATTERY PACK IS BEING CHARGED AT ALL TIMES.
5.

CONTRACTOR SHALL SEE ARCHITECTURAL DRAWINGS FOR THE FIRE WALL SEPARATIONS. CONTRACTOR SHALL PROVIDE CAULKING, SEAL-OFFS, ETC. AS REQUIRED BY CODE TO RETAIN FIRE WALL SEPARATION RATINGS.
6.



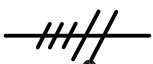


















































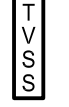


CONTRACTOR SHALL INCLUDE IN THE BID ALL COSTS TO HAVE A DEPARTMENT OF LABOR AND INDUSTRIES APPROVED FIRM TO EVALUATE THE INSTALLATION, SAFETY, AND COMPLIANCE WITH CODE AS REQUIRED PER W.A.C. 296-46B-901. FOR ANY EQUIPMENT SPECIFIED OR FURNISHED THAT IS NOT UL LABELED.
7.

ALL WALL PENETRATIONS SHALL BE NEATLY CORE-DRILLED, CAULKED AND SEALED TO MAINTAIN FIRE, AND WATERPROOF RATING. PATCH, REPAIR, AND PAINT TO MATCH EXISTING.
8.

ELECTRICAL CONTRACTOR SHALL HAVE TWO ELECTRICIANS AVAILABLE FOR AN AFTERHOURS (AFTER DARK) FINAL PUNCH LIST TO REVIEW AND PROGRAM / TRIM LIGHTING CONTROLS WITH THE LIGHTING DESIGNER. CONTRACTOR SHALL ANTICIPATE 6 HOURS AND HAVE A LADDER AVAILABLE TO COMPLETE THIS WORK.
9.

CONTRACTOR IS RESPONSIBLE FOR REMOVING ALL EXISTING LIGHTING ON LEVELS 1 AND 2 AND DISPOSING OF IN LEGAL MANNER. SEE ARCHITECTURAL RCP DEMOLITION PLAN FOR FIXTURE LOCATION AND COUNTS.

ELECTRICAL SYMBOLS LEGEND

| | |
|---|--|
|  | DETAIL/SECTION IDENTIFICATION: A = DETAIL/SECTION LETTER, B = SHEET NUMBER WHERE DETAIL/SECTION IS DRAWN. |
|  | EQUIPMENT CONNECTION CALLOUT. A,B EQUAL EQUIPMENT IDENTIFICATION ON MECHANICAL OR KITCHEN EQUIPMENT CONNECTION SCHEDULES. VERIFY EXACT EQUIPMENT REQUIREMENTS ON SHOP DRAWING EQUIPMENT SUBMITTALS PRIOR TO ROUGH-IN. DO NO ROUGH-IN FOR EQUIPMENT PRIOR TO REVIEW OF SUBMITTALS. REPORT ANY DIFFERENCES IN REQUIREMENTS TO ENGINEER IN WRITING. |
|  | CONDUIT CONCEALED. HASH MARKS INDICATE NUMBER OF #12 CONDUCTORS IN CODE SIZE CONDUIT. NO HASH MARKS INDICATES 2-#12 CONDUCTORS PLUS GROUND IN 3/4" CONDUIT, LONG HASH MARKS INDICATES NEUTRAL CONDUCTOR. ✓ INDICATES GROUND CONDUCTOR. |
|  | FLEXIBLE RACEWAY, PROVIDE GROUND CONDUCTORS PER NEC. |
|  | A-1,3 ADJACENT TO ARROW INDICATES HOMERUN OF CONDUCTORS IN CONDUIT FOR CIRCUITS 1 AND 3 TO PANEL "A". |
|  | EXIT LIGHT WITH BATTERY, UNIVERSAL MOUNTING. |
|  | EMERGENCY FLOODLIGHT WITH BATTERY. |
|  | LED LIGHT FIXTURE, SURFACE MOUNTED ON CEILING. |
|  | LED LIGHT FIXTURE, RECESS MOUNTED IN CEILING. |
|  | LED LIGHT FIXTURE, WITH EMERGENCY BATTERY PACK. |
|  | LED LIGHT FIXTURE, WALL MOUNTED. |
|  | LED STRIP LIGHT FIXTURE. SURFACE MOUNTED OR CHAIN HUNG FROM CEILING. |
|  | LED DOWNLIGHT FIXTURE. |
|  | LED WALL MOUNT LIGHT FIXTURE. |
|  | JUNCTION BOX. |
|  | LIGHT FIXTURE TYPE. A1 = SPECIFIC LIGHTING FIXTURE REFERENCED ON LIGHTING FIXTURE SCHEDULE. |
|  | PHOTOCELL, MOUNT ON ROOF FACING NORTH. |
|  | POWER PANEL |
|  | DUPLEX RECEPTACLE 20A, 125 VOLT WALL MOUNTED AT 18 INCHES AFF. G = GROUND FAULT INTERRUPTING, T = TAMPERPROOF. |
|  | DUPLEX RECEPTACLE 20A, 125 VOLT WALL MOUNTED HORIZONTALLY 2" ABOVE COUNTERTOP BACKSPLASH TO THE BOTTOM OF THE RECEPTACLE COVERPLATE. |
|  | FOURPLEX RECEPTACLE 20A, 125 VOLT, WALL MOUNTED AT 18 INCHES AFF. |
|  | FOURPLEX RECEPTACLE. (2)20A, 125 VOLT, DUPLEX RECEPTACLES; ONE SWITCHED, ONE UN-SWITCHED, WALL MOUNTED AT 18 INCHES AFF. U = USB / 120V, 20A DUPLEX RECEPTACLE. |
|  | SPECIAL RECEPTACLE. AMPERAGE AND VOLTAGE AS SHOWN. |
|  | EQUIPMENT CONNECTION. PROVIDE PER NEC AND MANUFACTURERS REQUIREMENTS AND/OR RECOMMENDATIONS. |
|  | 6" POKE-THRU FLOORBOX WITH (2)120V, 20A DUPLEX RECEPTACLES AND (4) DATA PORTS (WIREMOLD EVOLUTION SERIES OR APPROVED EQUAL). CONTRACTOR SHALL PROVIDE 1"C-(4)CAT 6 CABLES TO I.T. CLOSET AND TERMINATE ON NEW PATCH PANELS. |
|  | UNDER CARPET LEGRAND CONNECTRAC FLEX SYSTEM OR APPROVED EQUAL. CONTRACTOR SHALL PROVIDE POWER HUB (1)120V, 20A DUPLEX RECEPTACLES AT EACH SYMBOL LOCATION (CIRCLE WITH "P1") AND POWERTRAC RACEWAY TO WALL / COLUMN INDICATED ON FLOOR PLANS. WHERE THE POWERTRAC SYSTEM BUTTS UP TO A WALL OR COLUMN, CONTRACTOR SHALL PROVIDE CONDUIT/WIRE HOMERUN BACK TO POWER PANEL INDICATED. CONTRACTOR SHALL VERIFY EXACT LOCATIONS WITH OWNER/ARCHITECT PRIOR TO ROUGH-IN. |
|  | UNDER CARPET LEGRAND CONNECTRAC FLEX SYSTEM OR APPROVED EQUAL. CONTRACTOR SHALL PROVIDE POWER HUB (2)120V, 20A DUPLEX RECEPTACLES AT EACH SYMBOL LOCATION (CIRCLE WITH "P2") AND POWERTRAC RACEWAY TO WALL / COLUMN INDICATED ON FLOOR PLANS. WHERE THE POWERTRAC SYSTEM BUTTS UP TO A WALL OR COLUMN, CONTRACTOR SHALL PROVIDE CONDUIT/WIRE HOMERUN BACK TO POWER PANEL INDICATED. CONTRACTOR SHALL VERIFY EXACT LOCATIONS WITH OWNER/ARCHITECT PRIOR TO ROUGH-IN. |
|  | VAPE DETECTION DEVICE. HALO SMART SENSOR 3C OR APPROVED EQUAL. MOUNT ON WALL 12" BELOW CEILING. CONTRACTOR SHALL PROVIDE (1) CAT6 CABLE FROM VAPE DETECTOR TO CITY OF TACOMA'S CORPORATE NETWORK EXISTING CISCO POE SWITCHES IN THE SECOND FLOOR IDF#2 CLOSET AND TERMINATE. CONTRACTOR SHALL PROVIDE TRAINING OWNER (AT LEAST 3 PEOPLE AT THE CITY) ON HOW TO UTILIZE AND SET-UP THE HALO CLOUD APPLICATION TO NOTIFY STAFF WHEN DEVICES HAVE BEEN TRIGGERED. |
|  | REX DEVICE (REQUEST TO EXIT). SEE ACCESS CONTROL DETAILS ON SHEET E6.00 FOR ADDITIONAL INFORMATION. KANTECH #T.REX-LT WITH MOUNTING HARDWARE. |
|  | CARD READER. SEE ACCESS CONTROL DETAILS ON SHEET E6.00 FOR ADDITIONAL INFROMATION. KANTECH #P345MTR WITH MOUNTING HARDWARE. |
|  | <div><div>2</div><div></div><div>DOOR CONTROLLER. CONTRACTOR SHALL PROVIDE KANTECH KT-400, WIRING AND CONNECTORS FOR A COMPLETE SYSTEM PER MANUFACTURERS REQUIREMENTS. CONTRACTOR SHALL PROVIDE (1) RS485 CABLE BETWEEN ALL DOOR CONTROLLERS AND MASTER CONTROLLER IN CABINETY IN THE SOUTHEAST CORNER OF LEVEL 1.</div></div> |
|  | CAMERA LOCATION. 180° AND 360° CAMERAS = ILLUSTR FLEX MULTISENSOR #IFS16-M10-BT03 WITH MOUNTING HARDWARE. FIXED DOME CAMERAS = ILLUSTR FLEX GEN4 #IFS02-D12-ITA4 WITH MOUNTING HARDWARE. CONTRACTOR SHALL PROVIDE (1)CAT 6 CABLES FROM EACH CAMERA LOCATION TO SECURITY ROOM ON LEVEL 3 AND TERMINATE AT NEW POE SWITCH. SEE SHEET E3.03 FOR SECURITY HEADEND LOCATION. |
|  | INTERCOM LOCATION. AIPHONE #IXG-DM7-HID WITH STAINLESS STEEL SURFACE MOUNT BOX AIPHONE #SBX-IXGDM7. PROVIDE ALL WIRING PER MANUFACTURERS REQUIREMENTS FOR A COMPLETE AND OPERATIONAL INTERCOM SYSTEM. |
|  | VIDEO INTERCOM TENANT STATION (AIPHONE #IXG-2C7) FOR INTERCOM SYSTEM. PROVIDE ALL WIRING PER MANUFACTURERS REQUIREMENTS FOR A COMPLETE AND OPERATIONAL INTERCOM SYSTEM. |
|  | DOOR CONTACTS. CONTRACTOR SHALL PROVIDE 1/2"C-#18/2 BETWEEN DOOR CONTACTS AND POWER SUPPLY. FIRST FLOOR POWER SUPPLY SHALL BE LOCATED IN NEW CABINET INDICATED IN THE SOUTHEAST CORNER OF LEVEL 1 AND WILL SERVE ALL CONTROLLED DOORS ON LEVEL 1. SECOND FLOOR POWER SUPPLY SHALL BE LOCATED IN THE SOUTH WALL OF ROOM 204 AND WILL SERVE ALL CONTROLLED DOORS ON LEVELS 2 & 3. |
|  | LIGHT SWITCH TOGGLE TYPE, SINGLE POLE, SUBSCRIPTS: 3 = THREE WAY, 4 = FOUR WAY, D = DIMMER CONTROL, K = KEY OPERATED, P = PILOT LIGHT, a, b, c, ETC = NUMBER OF SWITCHES AT THE LOCATION AND SPECIFIC FIXTURES CONTROLLED. MOUNT AT 42 INCHES AFF. |
|  | DIGITAL 0-12 HOUR TIMER SWITCH. WATTSTOPPER TS-400 OR EQUAL |
|  | AUTOMATIC/MANUAL OCCUPANCY SENSOR AND SINGLE POLE TOGGLE SWITCH. WATT STOPPER DW-100 OR EQUAL. SWITCH SHALL BE PROGRAMMED FOR MANUAL ON, AUTOMATIC OFF. |
|  | DUAL TECHNOLOGY AUTOMATIC OCCUPANCY SENSOR DEVICE WITH POWER PACK (WATT STOPPER #DT-300). |
|  | DAYLIGHT PHOTOSENSOR |
|  | DISCONNECT SWITCH |
|  | FUSED DISCONNECT SWITCH WITH FUSES. |
|  | MOTOR RATED TOGGLE SWITCH WITH OVERLOAD HEATER(S), SIZE PER NEC AND MANUFACTURERS REQUIREMENTS. |
|  | FLUSH MOUNTED DUAL TELEPHONE/DATA OUTLET, MOUNT AT 18" AFF. PROVIDE 4" SQUARE BOX WITH 1" CONDUIT TO ACCESSIBLE CEILING SPACE AND (4)CAT 6 DATA CABLES TO I.T. ROOM ON SECOND FLOOR. CONTRACTOR SHALL PROVIDE PATCH PANEL(S) AND MOUNTING HARDWARE IN EXISTING DATA CLOSET FOR ALL NEW DATA CABLING AND TERMINATE. OWNER WILL PROVIDE ALL NETWORK SWITCHES AND JUMPERS. CONTRACTOR SHALL PROVIDE LABELS ON ALL CABLES, BOTH ENDS. |
|  | WIRELESS ACCESS POINT. PROVIDE (1)CAT 6A CABLE TO NEAREST IT ROOM AND TERMINATE AT PATCH PANEL. OWNER WILL PROVIDE ALL NETWORK SWITCHES AND JUMPERS. CONTRACTOR SHALL PROVIDE LABELS ON ALL CABLES, BOTH ENDS. CONTRACTOR SHALL PROVIDE CISCO, MODEL AIR-AP3802E WIRELESS ACCESS POINT. |
|  | GROUND PER NEC. |
|  | MANUAL FIRE ALARM PULL STATION. WALL MOUNT AT 42 INCHES AFF. ALL NEW FIRE ALARM DEVICES SHALL BE COMPATIBLE WITH THE EXISTING GAMEWELL E3 FIRE ALARM SYSTEM. CONTRACTOR SHALL PROVIDE PLENUM RATED FIRE ALARM CONDUCTORS AND CONNECT NEW DEVICES TO EXISTING ADDRESSABLE FIRE ALARM PANEL. CONTRACTOR'S FIRE ALARM SUB-CONTRACTOR IS RESPONSIBLE FOR PROVIDING CIRCUITED FIRE ALARM DRAWINGS AND BATTERY CALCULATIONS FOR THE FIRE MARSHALL'S APPROVAL. |
|  | FIRE ALARM HORN/ADA STROBE. WALL MOUNT AT 80 INCHES AFF. SUBSCRIPT INDICATES CANDELA LEVEL. ALL NEW FIRE ALARM DEVICES SHALL BE COMPATIBLE WITH THE EXISTING GAMEWELL E3 FIRE ALARM SYSTEM. CONTRACTOR SHALL PROVIDE PLENUM RATED FIRE ALARM CONDUCTORS AND CONNECT NEW DEVICES TO EXISTING ADDRESSABLE FIRE ALARM PANEL. CONTRACTOR'S FIRE ALARM SUB-CONTRACTOR IS RESPONSIBLE FOR PROVIDING CIRCUITED FIRE ALARM DRAWINGS AND BATTERY CALCULATIONS FOR THE FIRE MARSHALL'S APPROVAL. |
|  | FIRE ALARM MINI ADA STROBE. WALL MOUNT AT 80 INCHES AFF. SUBSCRIPT INDICATES CANDELA LEVEL. ALL NEW FIRE ALARM DEVICES SHALL BE COMPATIBLE WITH THE EXISTING GAMEWELL E3 FIRE ALARM SYSTEM. CONTRACTOR SHALL PROVIDE PLENUM RATED FIRE ALARM CONDUCTORS AND CONNECT NEW DEVICES TO EXISTING ADDRESSABLE FIRE ALARM PANEL. CONTRACTOR'S FIRE ALARM SUB-CONTRACTOR IS RESPONSIBLE FOR PROVIDING CIRCUITED FIRE ALARM DRAWINGS AND BATTERY CALCULATIONS FOR THE FIRE MARSHALL'S APPROVAL. |
|  | SMOKE DETECTOR. ALL NEW FIRE ALARM DEVICES SHALL BE COMPATIBLE WITH THE EXISTING GAMEWELL E3 FIRE ALARM SYSTEM. CONTRACTOR SHALL PROVIDE PLENUM RATED FIRE ALARM CONDUCTORS AND CONNECT NEW DEVICES TO EXISTING ADDRESSABLE FIRE ALARM PANEL. CONTRACTOR'S FIRE ALARM SUB-CONTRACTOR IS RESPONSIBLE FOR PROVIDING CIRCUITED FIRE ALARM DRAWINGS AND BATTERY CALCULATIONS FOR THE FIRE MARSHALL'S APPROVAL. |
|  | HEAT DETECTOR. ALL NEW FIRE ALARM DEVICES SHALL BE COMPATIBLE WITH THE EXISTING GAMEWELL E3 FIRE ALARM SYSTEM. CONTRACTOR SHALL PROVIDE PLENUM RATED FIRE ALARM CONDUCTORS AND CONNECT NEW DEVICES TO EXISTING ADDRESSABLE FIRE ALARM PANEL. CONTRACTOR'S FIRE ALARM SUB-CONTRACTOR IS RESPONSIBLE FOR PROVIDING CIRCUITED FIRE ALARM DRAWINGS AND BATTERY CALCULATIONS FOR THE FIRE MARSHALL'S APPROVAL. |
|  | AVAILABLE FAULT CURRENT |
|  | TRANSIENT VOLTAGE SURGE SUPPRESSION. TPS3-X-11-15-D2, SIEMENS OR EQUAL. "X" = VOLTAGE/ PHASE (VARIES). SEE POWER RISER DIAGRAM AND/OR PANEL SCHEDULES FOR VOLTAGE AND PHASE REQUIREMENTS. |
|  | EXISTING |
|  | WEATHERPROOF |

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seattle, washington 98119
office 206 775-8668

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PROJECT

**Tacoma Public Library
Main Branch Renovation**

LOCATION

**1102 Tacoma Ave S
Tacoma WA 98402**

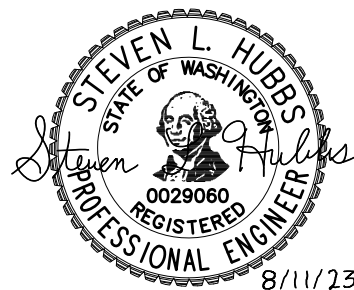
PREPARED FOR

**Tacoma Public
Library**

REVISION DATE NAME

| | | |
|---|---------|------------|
| 1 | 9/18/23 | Addendum 1 |
| 2 | 9/25/23 | Addendum 2 |

ARCHITECT STAMP



CROSS ENGINEERS, INC.
923 MLK Jr. Way
Tacoma, WA 98405
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Phone: (253) 759-0118
Job Number: 22-171

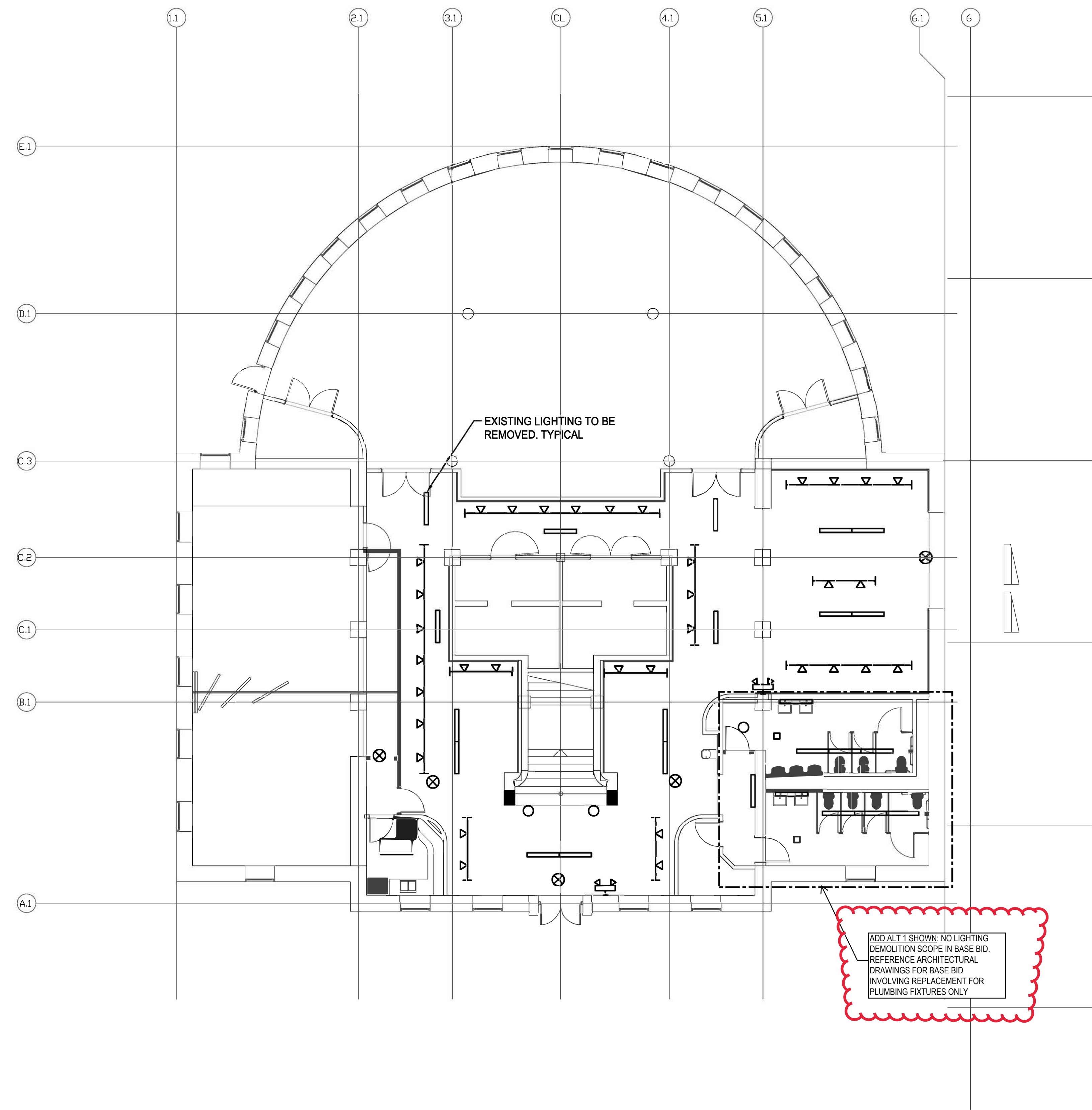
**ELECTRICAL LEGEND/
FIXTURE SCHEDULE**

08/11/2023

BID SET

E0.00

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DEMOLITION FLOOR PLAN - CARNEGIE LEVEL 1
SCALE: 1/8"=1'-0"



GENERAL NOTES:

1. CONTRACTOR SHALL REMOVE ALL LIGHTING AND LIGHTING CONTROLS IN THE AREA DESIGNATED TO BE DEMOLISHED, ASSOCIATED, CONDUIT, AND WIRE. CONTRACTOR SHALL DISPOSE OF REMOVED MATERIALS IN A LEGAL MANNER. CONTRACTOR SHALL INCLUDE A MINIMUM OF 20 HOURS IN THEIR BID TO FIELD VERIFY CIRCUITING FOR DEVICES IN ADJACENT AREAS NOT SHOWN TO BE DEMOLISHED. PROVIDE NEW CONDUIT, WIRE AND RE-CONNECT EXISTING CIRCUITRY DISTURBED BY DEMOLITION OF EXISTING EQUIPMENT.



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PROJECT
**Tacoma Public Library
Main Branch Renovation**

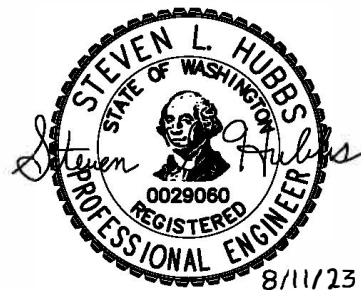
LOCATION
**1102 Tacoma Ave S
Tacoma WA 98402**

PREPARED FOR
**Tacoma Public
Library**

REVISION DATE NAME

1 9/25/23 ADDENDUM 2

ARCHITECT STAMP



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**DEMOLITION -
CARNEGIE LEVEL 1**

08/04/2023

BID SET

E1.03

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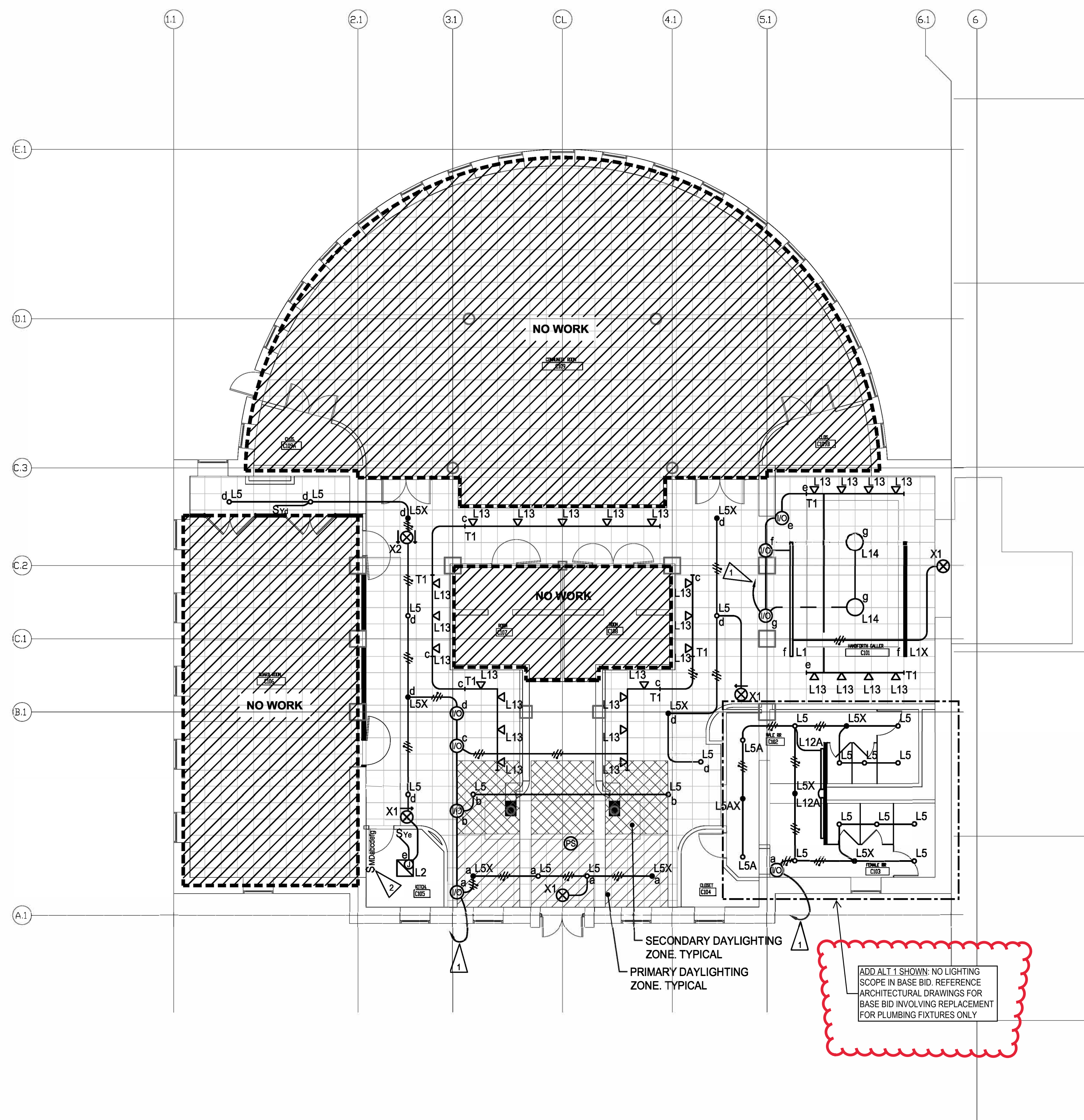


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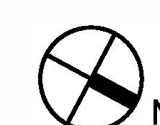


1. SEE SHEET E0.00 FOR ALL APPLICABLE GENERAL NOTES.

1. CONTRACTOR SHALL PROVIDE 3/4"C#12 CU CONDUCTORS AND CONNECT NEW LED LIGHTING TO EXISTING CIRCUIT SERVING EXISTING INCANDESCENT/FLUORESCENT LIGHTING TO BE REMOVED RESULTING IN A REDUCTION OF LOAD. CONTRACTOR MAY RE-USE EXISTING CONDUIT WHERE APPLICABLE.



SCALE: 1/8"=1'-0"



PROJECT
**Tacoma Public Library
Main Branch Renovation**

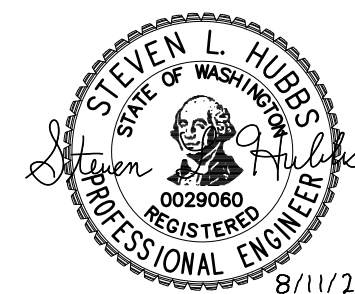
LOCATION
**1102 Tacoma Ave S
Tacoma WA 98402**

PREPARED FOR
**Tacoma Public
Library**

REVISION DATE NAME

1 9/18/23 Addendum 1
2 9/25/23 Addendum 2

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Phone: (253) 759-0118
Job Number: 22-171

**POWER/SIGNAL FLOOR PLAN -
LEVEL 1**

08/11/2023

BID SET

E3.01

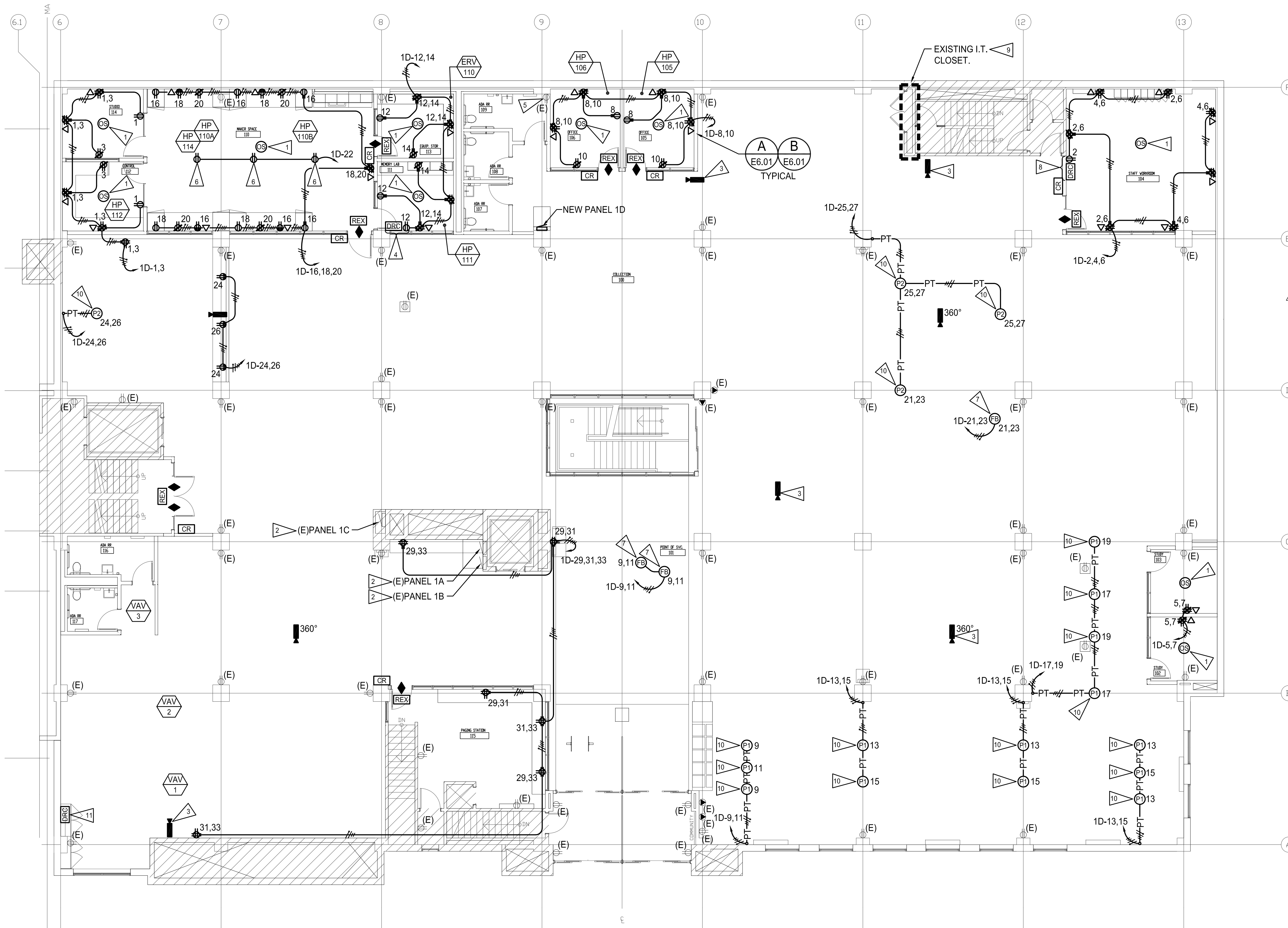
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GENERAL NOTES:

- ELECTRICAL REQUIREMENTS ARE NOT LIMITED TO ELECTRICAL DRAWINGS AND SPECIFICATIONS. THERE IS ADDITIONAL ELECTRICAL WORK REQUIRED TO BE INCLUDED IN THE BID, INDICATED ON ARCHITECTURAL AND MECHANICAL DRAWINGS. ADDITIONAL ELECTRICAL WORK REQUIRED IN THE BID IS ALSO LOCATED IN THE SPECIFICATIONS. CONTRACTOR SHALL REVIEW ALL ARCHITECTURAL AND MECHANICAL SPECIFICATIONS FOR ADDITIONAL ELECTRICAL INFORMATION AND INCLUDE COSTS FOR THIS WORK IN THE BID.
- ALL CONDUIT IS INTENDED TO BE CONCEALED. CONTRACTOR SHALL PROVIDE TO ARCHITECT/OWNER SHOP DRAWINGS INDICATING ROUTING OF ANY INTENDED EXPOSED CONDUIT PRIOR TO ROUGH-IN FOR ARCHITECT/OWNERS APPROVAL. CONTRACTOR SHALL NOT START ROUGH-IN FOR CONDUIT UNTIL WRITTEN APPROVAL IS RECEIVED.
- CONTRACTOR SHALL REFER TO ARCHITECTURAL DRAWINGS FOR THE FIRE WALL SEPARATIONS. CONTRACTOR SHALL PROVIDE CAULKING, SEAL-OFFS, RATED PENETRATION BLOCK-OUTS, ETC. AS REQUIRED BY CODE TO RETAIN FIRE WALL SEPARATION RATINGS.
- CONTRACTOR SHALL INCLUDE IN THE BID ALL COSTS TO HAVE A DEPARTMENT OF LABOR AND INDUSTRIES APPROVED FIRM TO EVALUATE THE INSTALLATION, SAFETY, AND COMPLIANCE WITH CODE AS REQUIRED PER W.A.C. 296-46B-901. FOR ANY EQUIPMENT SPECIFIED OR FURNISHED THAT IS NOT UL LABELED.
- THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE LOCATION AND PROTECTION OF ALL EXISTING UTILITIES. THE CONTRACTOR SHALL VERIFY ALL UTILITY LOCATIONS PRIOR TO CONSTRUCTION BY CALLING THE UNDERGROUND LOCATE LINE AT 1-(800)-424-5555 A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION. THE CONTRACTOR WILL ALSO BE RESPONSIBLE FOR MAINTAINING ALL LOCATE MARKS ONCE THE UTILITIES HAVE BEEN LOCATED.
- ALL WALL PENETRATIONS SHALL BE NEATLY CORE-DRILLED, CAULKED AND SEALED TO MAINTAIN FIRE, AND WATERPROOF RATING. PATCH, REPAIR, AND PAINT TO MATCH EXISTING.
- NOT USED.
- THE EXISTING ACCESS CONTROL SYSTEM IS AN EXISTING KANTECH SYSTEM AND EXISTING CCTV SYSTEM IS A EXACQ SYSTEM. ALL NEW DEVICES SHALL BE COMPATIBLE WITH THE EXISTING CONTROL SYSTEM. CONTRACTOR SHALL CONTACT JAMES PIPPENGER AT JOHNSON CONTROLS FOR BIDS (425.534.8989) ON NEW VIDEO INTERCOM DEVICES, ACCESS CONTROL DEVICES AND CCTV.

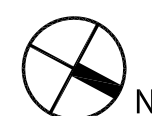
ELECTRICAL NOTES:

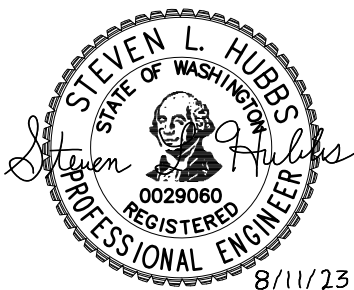
- CEILING MOUNTED OCCUPANCY SENSOR SHALL TURN OFF CONTROLLED RECEPTACLE AFTER 20 MINUTES OF NO OCCUPANT DETECTION PER WASHINGTON STATE ENERGY CODE SECTION 405.10.
- CONTRACTOR SHALL PROVIDE A NEW PANEL LOCK ON EXISTING PANEL AND PROVIDE THE OWNER WITH NEW KEYS.
- EXISTING CAMERA LOCATION. CONTRACTOR SHALL REPOSITION/AIM PER OWNER DIRECTION.
- MOUNT NEW DOOR CONTROLLER ABOVE T-BAR CEILING AT THIS LOCATION FOR DOORS 105, 106, 110 AND 113.
- CONTRACTOR SHALL REMOVE EXISTING RECEPTACLE, PROVIDE NEW 3/4"C-#12 CU CONDUCTORS AND RECONNECT EXISTING RECEPTACLES TO REMAIN.
- CONTRACTOR SHALL PROVIDE RETRACTABLE CORD REEL WITH (2) 120V, 20A DUPLEX RECEPTACLES. REELCRAFT #L4525-123-7A OR APPROVED EQUAL.
- CONTRACTOR SHALL X-RAY EXISTING SLAB AND PROVIDE CORE PER MANUFACTURER'S REQUIREMENTS. CONTRACTOR SHALL COORDINATE EXACT LOCATIONS WITH OWNER / ARCHITECT PRIOR TO CORING.
- MOUNT NEW DOOR CONTROLLER ABOVE T-BAR CEILING AT THIS LOCATION FOR DOORS 104.
- ROUTE ALL NEW DATA CABLING THROUGH I.T. CLOSET TO SECOND FLOOR AND TERMINATE AT NEW PATCH PANELS IDENTIFIED ON E3.02.
- UNDER CARPET LEGRAND CONNECTRAC FLEX SYSTEM POWER HUB LOCATION. CONTRACTOR SHALL COORDINATE EXACT LOCATIONS WITH OWNER / ARCHITECT PRIOR TO ROUGH-IN.
- MOUNT NEW DOOR CONTROLLER "DRC" IN CABINET, LOCATED IN SOUTHEAST CORNER OF LEVEL ONE TO SERVE DOORS 115 AND STAIR DOOR LEADING TO CARNEGIE HALL.



POWER/SIGNAL FLOOR PLAN - LEVEL 1

SCALE: 1/8"=1'-0"





GENERAL NOTES:

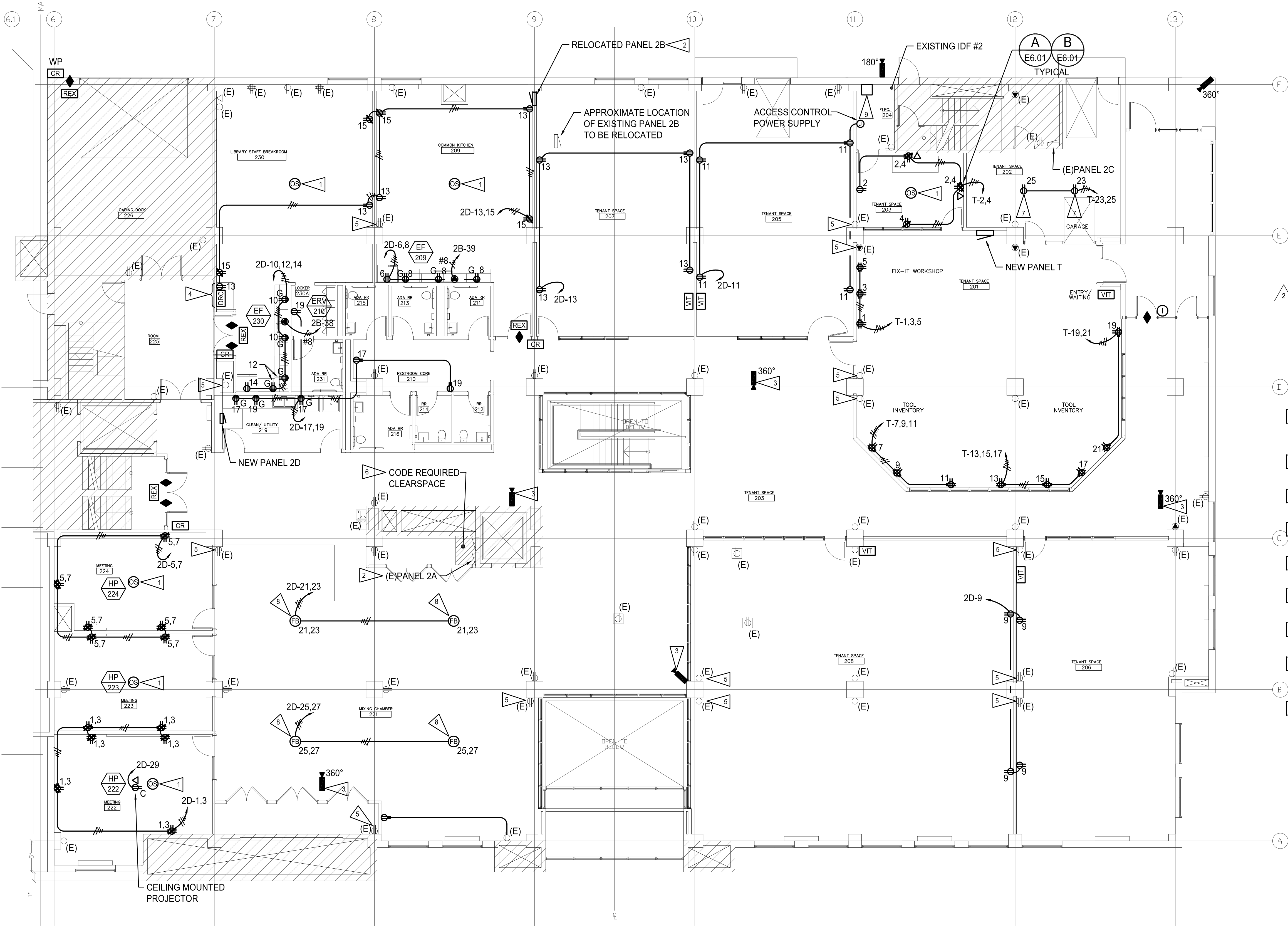
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- CONTRACTOR SHALL REFER TO ARCHITECTURAL DRAWINGS FOR THE FIRE WALL SEPARATIONS. CONTRACTOR SHALL PROVIDE CAULKING, SEAL-OFFS, RATED PENETRATION BLOCK-OUTS, ETC. AS REQUIRED BY CODE TO RETAIN FIRE WALL SEPARATION RATINGS.
- CONTRACTOR SHALL INCLUDE IN THE BID ALL COSTS TO HAVE A DEPARTMENT OF LABOR AND INDUSTRIES APPROVED FIRM TO EVALUATE THE INSTALLATION, SAFETY, AND COMPLIANCE WITH CODE AS REQUIRED PER W.A.C. 296-46B-901. FOR ANY EQUIPMENT SPECIFIED OR FURNISHED THAT IS NOT UL LABELED.
- THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE LOCATION AND PROTECTION OF ALL EXISTING UTILITIES. THE CONTRACTOR SHALL VERIFY ALL UTILITY LOCATIONS PRIOR TO CONSTRUCTION BY CALLING THE UNDERGROUND LOCATE LINE AT 1-(800)-424-5555 A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION. THE CONTRACTOR WILL ALSO BE RESPONSIBLE FOR MAINTAINING ALL LOCATE MARKS ONCE THE UTILITIES HAVE BEEN LOCATED.
- ALL WALL PENETRATIONS SHALL BE NEATLY CORE-DRILLED, CAULKED AND SEALED TO MAINTAIN FIRE, AND WATERPROOF RATING. PATCH, REPAIR, AND PAINT TO MATCH EXISTING.
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- THE EXISTING ACCESS CONTROL SYSTEM IS AN EXISTING KANTECH SYSTEM AND EXISTING CCTV SYSTEM IS A EXACQ SYSTEM. ALL NEW DEVICES SHALL BE COMPATIBLE WITH THE EXISTING CONTROL SYSTEM. CONTRACTOR SHALL CONTACT JAMES PIPPENGER AT JOHNSON CONTROLS FOR BIDS (425.534.8989) ON NEW VIDEO INTERCOM DEVICES, ACCESS CONTROL DEVICES AND CCTV.

ELECTRICAL NOTES:

- CEILING MOUNTED OCCUPANCY SENSOR SHALL TURN OFF CONTROLLED RECEPTACLE AFTER 20 MINUTES OF NO OCCUPANT DETECTION PER WASHINGTON STATE ENERGY CODE SECTION 405.10.
- CONTRACTOR SHALL PROVIDE A NEW PANEL LOCK ON EXISTING PANEL AND PROVIDE THE OWNER WITH NEW KEYS.
- EXISTING CAMERA LOCATION. CONTRACTOR SHALL REPOSITION/AIM PER OWNER DIRECTION.
- MOUNT NEW DOOR CONTROLLER ABOVE T-BAR CEILING AT THIS LOCATION FOR DOORS 209, 220, 225, AND 226.
- CONTRACTOR SHALL REMOVE EXISTING RECEPTACLE, PROVIDE NEW 3/4"C-#12 CU CONDUCTORS AND RECONNECT EXISTING RECEPTACLES TO REMAIN.
- CONTRACTOR SHALL PAINT (SAFETY YELLOW) ON FLOOR FOR CODE REQUIRED CLEARSPACE PER NATIONAL ELECTRICAL CODE.
- CONTRACTOR SHALL PROVIDE RETRACTABLE CORD REEL WITH (2) 120V, 20A DUPLEX RECEPTACLES. REELCRAFT #L4525-123-7A OR APPROVED EQUAL.
- CONTRACTOR SHALL X-RAY EXISTING SLAB AND PROVIDE CORE PER MANUFACTURER'S REQUIREMENTS. CONTRACTOR SHALL COORDINATE EXACT LOCATIONS WITH OWNER / ARCHITECT PRIOR TO CORING.
- CONTRACTOR SHALL PROVIDE NEW WALL MOUNTED DATA RACK (CHATSWORTH #15320-24X OR EQUAL) WITH (5) 48 PORT PATCH PANELS (ICC #ICMPP48CP6 OR EQUAL) AND TERMINATE ALL CAT 6 CABLES FOR OWNER'S I.T. VENDER'S USE.

POWER/SIGNAL FLOOR PLAN - LEVEL 2

SCALE: 1/8"=1'-0"

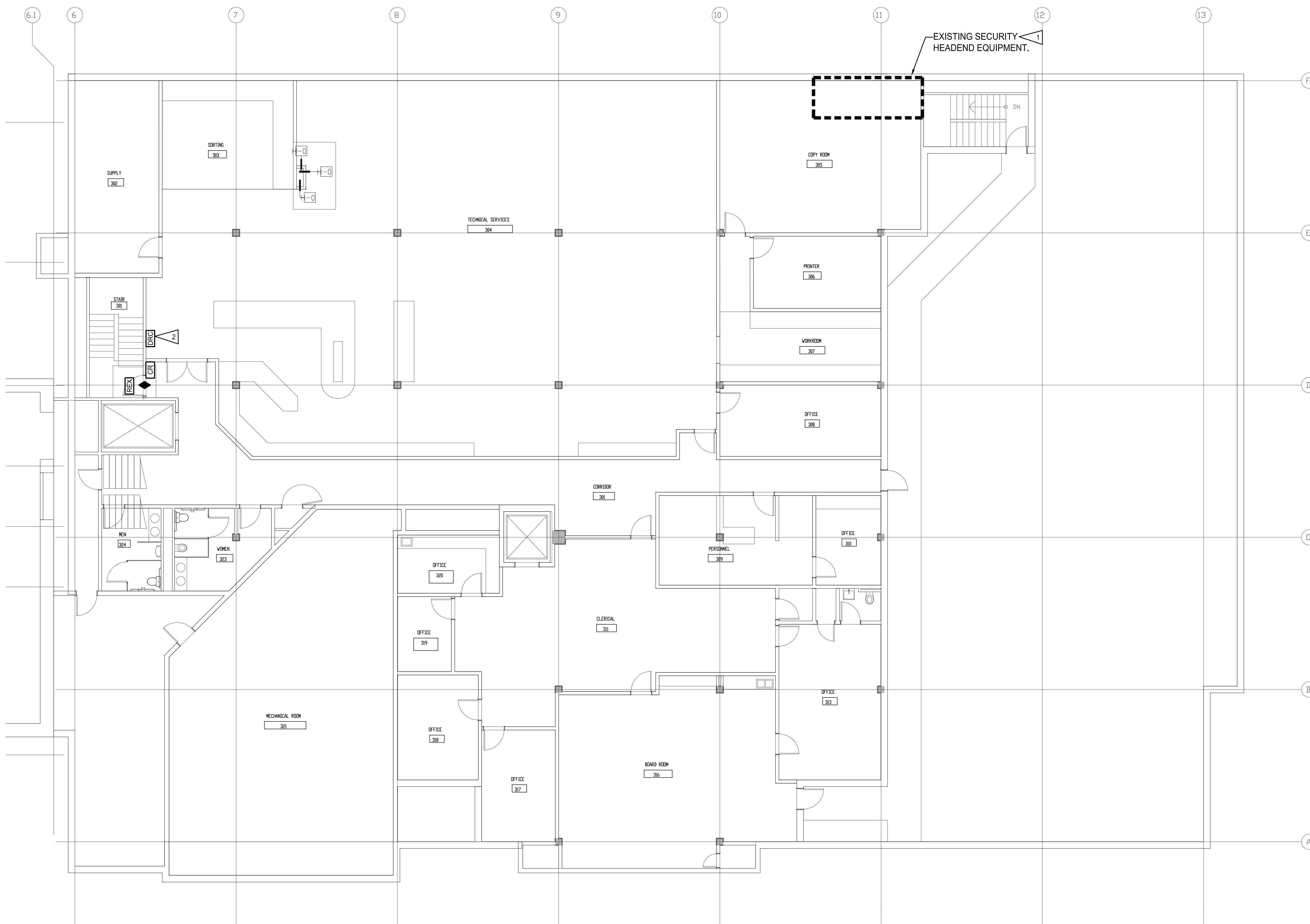




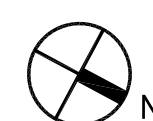
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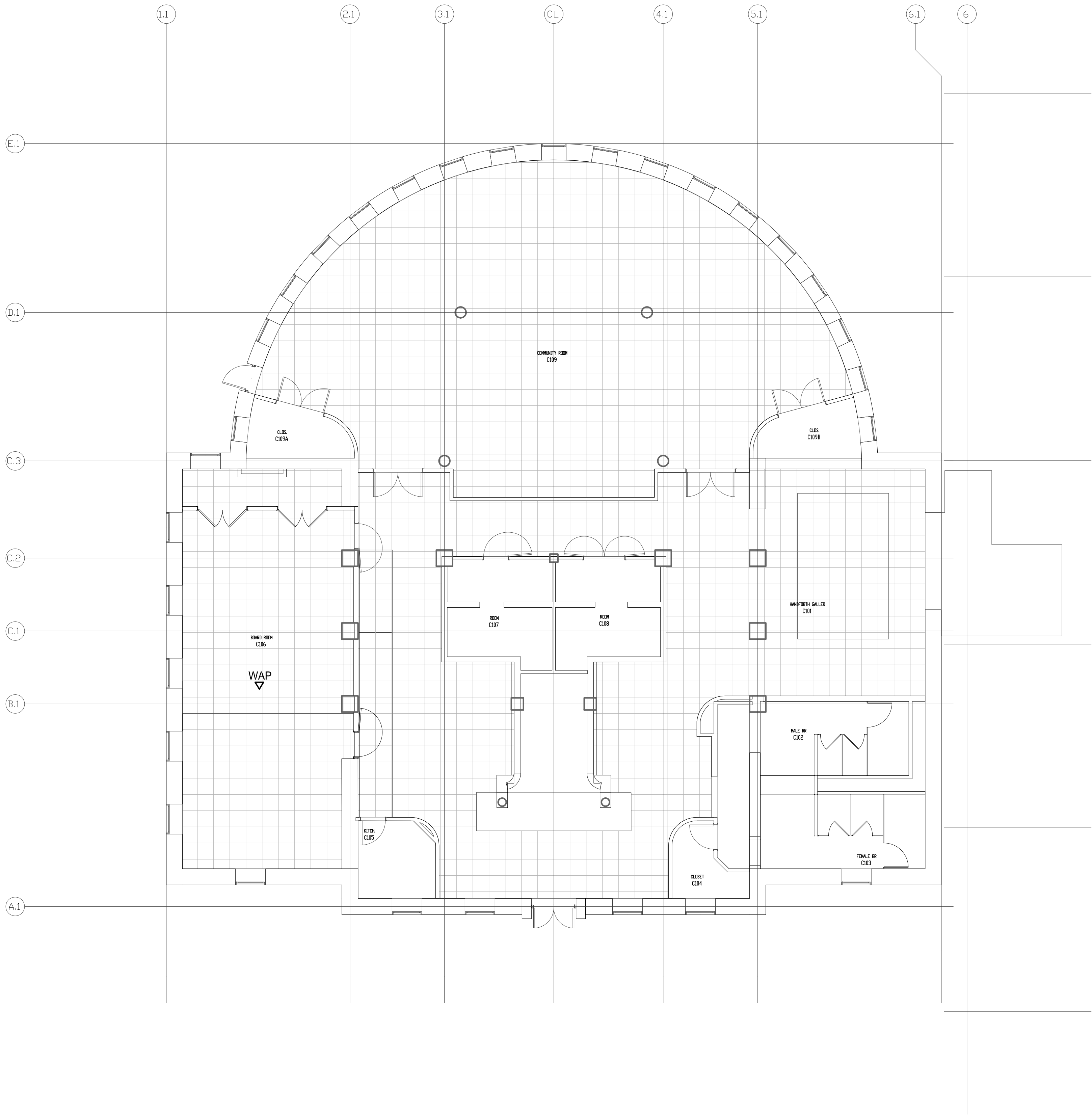


➤ MOUNT NEW DOOR CONTROLLER ABOVE T-BAR CEILING AT THIS LOCATION FOR DOORS 301



SCALE: 1/8"=1'-0"





POWER/SIGNAL FLOOR PLAN - CARNEGIE LEVEL 1
SCALE: 1/8"=1'-0"



GENERAL NOTES:

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3. CONTRACTOR SHALL REFER TO ARCHITECTURAL DRAWINGS FOR THE FIRE WALL SEPARATIONS. CONTRACTOR SHALL PROVIDE CAULKING, SEAL-OFFS, RATED PENETRATION BLOCK-OUTS, ETC. AS REQUIRED BY CODE TO RETAIN FIRE WALL SEPARATION RATINGS.
4. CONTRACTOR SHALL INCLUDE IN THE BID ALL COSTS TO HAVE A DEPARTMENT OF LABOR AND INDUSTRIES APPROVED FIRM TO EVALUATE THE INSTALLATION, SAFETY, AND COMPLIANCE WITH CODE AS REQUIRED PER W.A.C. 296-46B-901. FOR ANY EQUIPMENT SPECIFIED OR FURNISHED THAT IS NOT UL LABELED.
5. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE LOCATION AND PROTECTION OF ALL EXISTING UTILITIES. THE CONTRACTOR SHALL VERIFY ALL UTILITY LOCATIONS PRIOR TO CONSTRUCTION BY CALLING THE UNDERGROUND LOCATE LINE AT 1-(800)-424-5555 A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION. THE CONTRACTOR WILL ALSO BE RESPONSIBLE FOR MAINTAINING ALL LOCATE MARKS ONCE THE UTILITIES HAVE BEEN LOCATED.
6. ALL WALL PENETRATIONS SHALL BE NEATLY CORE-DRILLED, CAULKED AND SEALED TO MAINTAIN FIRE, AND WATERPROOF RATING. PATCH, REPAIR, AND PAINT TO MATCH EXISTING.
7. NOT USED.
8. THE EXISTING ACCESS CONTROL SYSTEM IS AN EXISTING KANTECH SYSTEM AND EXISTING CCTV SYSTEM IS A EXACQ SYSTEM. ALL NEW DEVICES SHALL BE COMPATIBLE WITH THE EXISTING CONTROL SYSTEM. CONTRACTOR SHALL CONTACT JAMES PIPPENGER AT JOHNSON CONTROLS FOR BIDS (425.534.8989) ON NEW VIDEO INTERCOM DEVICES, ACCESS CONTROL DEVICES AND CCTV.

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PROJECT

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Main Branch Renovation**

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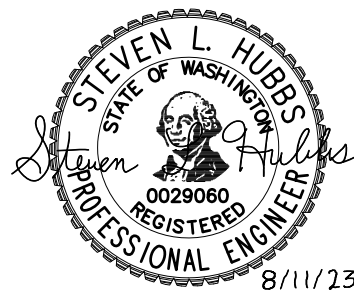
PREPARED FOR

**Tacoma Public
Library**

REVISION DATE NAME

| | | |
|---|---------|------------|
| 1 | 9/18/23 | Addendum 1 |
| 2 | 9/25/23 | Addendum 2 |

ARCHITECT STAMP



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Phone: (253) 759-0118
Job Number: 22-171

**POWER/SIGNAL FLOOR PLAN -
CARNEGIE LEVEL 1**

08/11/2023

BID SET

E3.04

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| M002 | MECHANICAL NOTES |
| M003 | MECHANICAL SCHEDULES |
| M004 | MECHANICAL SCHEDULES |
| M100 | MAIN BUILDING BASEMENT PLAN - MECHANICAL DEMOLITION |
| M101 | MAIN BUILDING, LEVEL 1 FLOOR PLAN - MECHANICAL DEMOLITION |
| M102 | MAIN BUILDING, LEVEL 2 FLOOR PLAN - MECHANICAL DEMOLITION |
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| M305 | [NOT USED] |
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| M311 | PLUMBING DETAILS |
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| M407 | MAIN BUILDING, LEVEL 2 FLOOR PLAN - REFRIGERANT PIPING |
| M408 | MAIN BUILDING, LEVEL 3 FLOOR PLAN - REFRIGERANT PIPING |
| M409 | MAIN BUILDING, ROOF LEVEL FLOOR PLAN - REFRIGERANT PIPING |
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| M412 | HVAC DETAILS |
| M413 | HVAC DETAILS |

| MECHANICAL LEGEND | | | |
|-------------------|--|------------|--|
| SYMBOL | DESCRIPTION | ABBREV. | DESCRIPTION |
| | WASTE OR SOIL (W) | AFF | ABOVE FINISHED FLOOR |
| | VENT (V) | APPROX | APPROXIMATELY |
| | COLD WATER (CW) | ARCH | ARCHITECTURAL |
| | HOT WATER (HW) | BDD | BACKDRAFT DAMPER |
| | HOT WATER CIRCULATING (HWC) | BLDG | BUILDING |
| | CONDENSATE LINE (C) | B.O.D. | BOTTOM OF DUCT |
| | FIRE (F) | BTU | BRITISH THERMAL UNIT |
| | PIPE UP | BTUH | BRITISH THERMAL UNIT/HOUR |
| | PIPE DOWN | CAP | CAPACITY |
| | PIPE TEE INLINE | CFH | CUBIC FEET PER HOUR |
| | ISOLATION VALVE | CFM | CUBIC FEET PER MINUTE |
| | BALANCING VALVE | CLG | CEILING |
| | CHECK VALVE | CO | CLEANOUT |
| | UNION | COMP | COMPRESSOR |
| | CLEANOUT | CONN | CONNECTION |
| | WALL CLEANOUT | CONT | CONTINUE, CONTINUATION |
| | RELIEF VALVE OR SAFETY VALVE | COP | COEFFICIENT OF PERFORMANCE |
| | STRAINER | CW | COLD WATER |
| | CONCENTRIC REDUCER | dB | DECIBEL |
| | HOSE BIBB | DB | DRY BULB |
| | THERMOMETER | DEG F, F | DEGREE FAHRENHEIT |
| | SENSOR WELL | DIA, Ø | DIAMETER |
| | DUCT (FIRST FIGURE, SIDE SHOWN) | DN | DOWN |
| | LINED DUCT (DIM. FOR NET FREE AREA) | DWG | DRAWING |
| | RISE (R) OR DROP (D) ARROW IN DIRECTION OF FLOW | EA | EACH |
| | VOLUME DAMPER (MANUAL) | ECM | ELECTRONICALLY COMMUTATED MOTOR |
| | MOTORIZED DAMPER | ELEC | ELECTRICAL, ELECTRIC |
| | FLEXIBLE CONNECTION | EER | ENERGY EFFICIENCY RATIO |
| | RETURN, EXHAUST, OUTSIDE AIR DUCT DOWN | EAT | ENTERING AIR TEMPERATURE |
| | SUPPLY AIR DUCT DOWN | EWB | ENTERING WET BULB |
| | RETURN, EXHAUST, OUTSIDE AIR DUCT UP | EDB | ENTERING DRY BULB |
| | SUPPLY AIR DUCT UP | EOL | END OF LINING |
| | ELBOW WITH TURNING VANES | (ETR) | EXISTING TO REMAIN |
| | FLEXIBLE DUCT | EXH | EXHAUST |
| | ROUND DUCT | EXIST, (E) | EXISTING |
| | CEILING OUTLET | ESP | EXTERNAL STATIC PRESSURE |
| | CEILING INLET | FV | FACE VELOCITY |
| | WALL AIR INLET | FOB | FLAT ON BOTTOM |
| | WALL AIR OUTLET | FOT | FLAT ON TOP |
| | THERMOSTAT | FPM | FEET PER MINUTE |
| | INTERVAL TIMER | FLEX | FLEXIBLE |
| | CO2 SENSOR | FL | FLOOR |
| | TRANSFORMER FOR FLUSH VALVES | FCO | FLOOR CLEAN OUT |
| | | FLA | FULL LOAD AMPS |
| | | GAL | GALLON |
| | | GALV. | GALVANIZED |
| | | G.C. | GENERAL CONTRACTOR |
| | | GPM | GALLON PER MINUTE |
| | | GPH | GALLON PER HOUR |
| | | HP | HORSE POWER |
| | | HW | HOT WATER |
| | | HWC | HOT WATER CIRCULATING |
| | | IN | INCH |
| | | I.E. | INVERT ELEVATION |
| | | KW | KILOWATT |
| | | LAT | LEAVING AIR TEMPERATURE |
| | | LDB | LEAVING DRY BULB |
| | | LWT | LEAVING WATER TEMPERATURE |
| | | LWB | LEAVING WET BULB |
| | | MAX | MAXIMUM |
| | | MBH | THOUSAND BTUH |
| | | MCA | MINIMUM CIRCUIT AMPS |
| | | MECH | MECHANICAL |
| | | MFR | MANUFACTURER |
| | | MFS | MAXIMUM FUSE SIZE |
| | | MIN | MINIMUM |
| | | NTS | NOT TO SCALE |
| | | OA | OUTSIDE AIR |
| | | PD | PRESSURE DROP |
| | | PH | PHASE |
| | | RA | RETURN AIR |
| | | REF | REFERENCE |
| | | REQ'D | REQUIRED |
| | | RG | REFRIGERANT GAS |
| | | RL | REFRIGERANT LIQUID |
| | | RLA | RATED LOAD AMPS |
| | | RPM | REVOLUTIONS PER MINUTE |
| | | RM | ROOM |
| | | SA | SUPPLY AIR |
| | | SHT | SHEET |
| | | S.O. | SCREENED OPENING |
| | | S.S. | STAINLESS STEEL |
| | | TEMP | TEMPERATURE |
| | | TD | TRANSFER DUCT |
| | | TG | TRANSFER GRILLE |
| | | TSP | TOTAL STATIC PRESSURE |
| | | TTSTAT | THERMOSTAT |
| | | TYP | TYPICAL |
| | | UNO | UNLESS NOTED OTHERWISE |
| | | V | VOLTS, VOLTAGE - VENT |
| | | VFD | VARIABLE FREQUENCY DRIVE |
| | | VTR | VENT THROUGH ROOF |
| | | W | WATT |
| | | W/ | WITH |
| | | WB | WET BULB |
| | | WCO | WALL CLEAN OUT - WASTE |
| | | ZVD | ZONE VOLUME DAMPER (AIR TERMINAL UNIT) |

architecture
design
preservation

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seattle, washington 98119
office 206 775-8668

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PROJECT
**Tacoma Public Library
Main Branch**

LOCATION
**1102 Tacoma Ave S
Tacoma WA 98402**

PREPARED FOR
**Tacoma Public
Library**

| REVISION | DATE | NAME |
|----------|---------|------------|
| 2 | 9/25/23 | Addendum 2 |
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PROFESSIONAL STAMP



SIGNED
09-25-2023

HULTZ & BHU

engineers inc

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Fax: (253) 383-3283
Job Number: 22-228

MECHANICAL LEGEND

08/07/2023

Bid Set

M001



PROJECT

Tacoma Public Library
Main Branch

LOCATION

1102 Tacoma Ave S
Tacoma WA 98402

PREPARED FOR

Tacoma Public
Library

REVISION DATE NAME

2 9/25/23 Addendum 2

PROFESSIONAL STAMP



HULTZ  BHU
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MECHANICAL SCHEDULES

08/07/2023

Bid Set

M003

| PUMP SCHEDULE | | | | | | | | | |
|-----------------|---|-----------------------|-------------|-----|-----------------|------------|----------|---|--|
| SYMBOL | BASIS OF DESIGN MANUFACTURER AND SERIES NO. | TYPE | SERVICE | GPM | HEAD FT. H2O | ELECTRICAL | | REMARKS | |
| | | | | | | HP | VOLTS/PH | | |
| CP-100 | GRUNDFOS UP | DOMESTIC CIRCULATOR | DOMESTIC HW | - | - | 1/3 | 115/1 | ALL BRONZE | |
| SP-1A, SP-1B | HYDRAMATIC HPGHX300 | SUMP PUMP, GRINDER | WASTE | 58 | 24 | 3 | 208/3 | DUPLEX PUMP, EXPLOSION PROOF, TL PRO LIFTOUT SYSTEM, CONTROL PANEL, REMOTE AUDIO/VISUAL ALARM, ALTERNATOR AND 3 FLOATS | |
| | | | | 58 | 24 | 3 | 208/3 | | |

| WATER HEATER SCHEDULE | | | | | | | | | | | |
|-----------------------|---|---------------|-------------|----------------------|------------------|-------------|-----|-----|------------|----------|---------|
| SYMBOL | BASIS OF DESIGN MANUFACTURER AND SERIES NO. | TYPE | AREA SERVED | INPUT RATING (KW) | STORAGE (GAL) | DOMESTIC HW | | | ELECTRICAL | | REMARKS |
| | | | | | | GPH | EWT | LWT | FLA | VOLTS/PH | |
| WH-100 | A.O. SMITH DEN-66 | ELECTRIC TANK | DOMESTIC HW | 5 | 66 | 25 | 40 | 120 | 13.8 | 208/3 | |
| | | | | | | | | | | | |

| SYMBOL | BASIS OF DESIGN MANUFACTURER AND SERIES NO. | AREA SERVED | SUPPLY FAN | | | | EXHAUST FAN | | | | UNIT ELECTRICAL | | | | FILTERS | | MAX UNIT WEIGHT (LBS) | REMARKS |
|---------|---|------------------------|-----------------|-----|-----|-----|-----------------|-----|-----|-----|-----------------|-------|------|----------|---------------|--------------|-----------------------------|---------|
| | | | TYPE | CFM | ESP | RPM | TYPE | CFM | ESP | RPM | POWER | MCA | MOCP | VOLTS/PH | TYPE | MIN. SF | | |
| ERV-110 | RENEWAIRE EV450IN | OFFICE/ STORAGE/RR | DIRECT DRIVE | 405 | .6" | - | DIRECT DRIVE | 375 | .6" | - | 0.5 HP | 6 A | 15 A | 208/1 | 2" MERV 13 | MFR'S STD | 202 | |
| ERV-210 | RENEWAIRE HE1.5XINH | MEETING/ STORAGE/RR | DIRECT DRIVE | 785 | .6" | - | DIRECT DRIVE | 755 | .6" | - | 1 HP | 9.9 A | 15 A | 208/1 | 2" MERV 13 | MFR'S STD | 504 | |
| | | | | | | | | | | | | | | | | | | |

| FAN SCHEDULE | | | | | | | | | | | | | | |
|--|---|------------|-----------------------|------|------|------|--------------|------------|------------|--------|-------------------|----------------------|---------|--|
| SYMBOL | BASIS OF DESIGN MANUFACTURER AND SERIES NO. | TYPE | AREA SERVED | CFM | ESP | RPM | WHEEL DIA | ELECTRICAL | | DRIVE | CONTROL | MAX WEIGHT LBS | REMARKS | |
| | | | | | | | | HP | VOLTS / PH | | | | | |
| EF-110 | COOK 90SQN17DEC | INLINE FAN | 1ST FLOOR RESTROOM | 240 | 0.5" | 1501 | - | 1/6 | 115/1 | DIRECT | TIME CLOCK | 60 | ① ② ③ | |
| EF-209 | COOK 120SQN17DEC | INLINE FAN | COMMON KITCHEN | 1040 | 0.5" | 1725 | - | 1/2 | 115/1 | DIRECT | INTERVAL TIMER | 125 | ① ② ③ | |
| EF-230 | COOK 120SQN17DEC | INLINE FAN | LIBRARY BREAKROOM | 1200 | 0.5" | 1725 | - | 1/2 | 115/1 | DIRECT | INTERVAL TIMER | 125 | ① ② ③ | |
| ACCESSORIES: ① = SPEED CONTROL ② = DISCONNECT ③ = EC MOTOR | | | | | | | | | | | | | | |

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|--|-----------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|------------|-----------------------|-------------------------|-------------------|---------------------------|--|--|
| OA VENTILATION CALCULATION PER IMC 2018 | | | | | | | | | | | | | | | Date: | 6/12/23 | | | | | |
| | | | | | | | | | | | | | | | Calc By: | CBP | | | | | |
| Project: | Tacoma Public Library | | | | | | | | | | | | | | Az= | zone area | Ra= | OA per sf of area | | | |
| No: | 22-228 | | | | | | | | | | | | | | Sf= | square feet | Vbz= | breathing zone OA | | | |
| | | | | | | | | | | | | | | | Rp= | OA per person* | = Rp*P/1000 + Ra*Az | | | | |
| | | | | | | | | | | | | | | | P/1000 sf= | People density | = OA before corrections | | | | |
| | | | | | | | | | | | | | | | Pz= | zone population | Ez= | | air distrib effectiveness | | |
| | | | | | | | | | | | | | | | Ps= | actual concurrent pop | Voz= | | zone OA = Vbz/Ev | | |
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[illegible]

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general@hultzbhu.com Job Number: 22-228

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| SYMBOL | BASIS OF DESIGN MANUFACTURER AND SERIES NO. | TYPE | AREA SERVED | SERVED BY | CAPACITY (MBH) | | CFM | ESP | MIN OA | FILTERS | UNIT ELECTRICAL | | MAX WEIGHT LBS | REMARKS |
|---------|---|-------------------------------|-----------------|-------------|----------------|---------|-----|------|--------|------------------|-----------------|---------|----------------------|------------------------------|
| | | | | | COOLING | HEATING | | | | TYPE | MCA | VOLT/PH | | |
| HP-105 | mitsubishi city multi PLFY-P05 | CEILING CASSETTE 24" X 24" | OFFICE 105 | CU-1 / BC-1 | 5 | 5.6 | - | - | - | WASHABLE MESH | 0.24 | 208/1 | 50 | |
| HP-106 | mitsubishi city multi PLFY-P05 | CEILING CASSETTE 24" X 24" | OFFICE 106 | CU-1 / BC-1 | 5 | 5.6 | - | - | - | WASHABLE MESH | 0.24 | 208/1 | 50 | |
| HP-110A | mitsubishi city multi PLFY-P08 | CEILING CASSETTE 24" x 24" | MAKER SPACE 110 | CU-1 / BC-1 | 8 | 9 | - | - | - | WASHABLE MESH | 0.3 | 208/1 | 50 | |
| HP-110B | mitsubishi city multi PLFY-P08 | CEILING CASSETTE 24" x 24" | MAKER SPACE 110 | CU-1 / BC-1 | 8 | 9 | - | - | - | WASHABLE MESH | 0.3 | 208/1 | 50 | |
| HP-111 | mitsubishi city multi PLFY-P05 | CEILING CASSETTE 24" x 24" | MEMORY LAB 111 | CU-1 / BC-1 | 5 | 5.6 | - | - | - | WASHABLE MESH | 0.24 | 208/1 | 50 | |
| HP-112 | mitsubishi city multi PLFY-P05 | CEILING CASSETTE 24" x 24" | CONTROL 112 | CU-1 / BC-1 | 5 | 5.6 | - | - | - | WASHABLE MESH | 0.24 | 208/1 | 50 | |
| HP-114 | mitsubishi city multi PEFY-P06 | CEILING CONCEALED | STUDIO 114 | CU-1 / BC-1 | 6 | 6.7 | 200 | 0.5" | - | WASHABLE MESH | 1.75 | 208/1 | 50 | W/ LINED FILTER BOX / PLENUM |
| HP-222A | mitsubishi city multi PLFY-P12 | CEILING CASSETTE 24" x 24" | MEETING 222 | CU-1 / BC-2 | 12 | 13.5 | - | - | - | WASHABLE MESH | 0.3 | 208/1 | 50 | |
| HP-222B | mitsubishi city multi PLFY-P12 | CEILING CASSETTE 24" x 24" | MEETING 222 | CU-1 / BC-2 | 12 | 13.5 | - | - | - | WASHABLE MESH | 0.3 | 208/1 | 50 | |
| HP-223 | mitsubishi city multi PLFY-P15 | CEILING CASSETTE 24" x 24" | MEETING 223 | CU-1 / BC-2 | 18 | 20 | - | - | - | WASHABLE MESH | 0.5 | 208/1 | 50 | |
| HP-224 | mitsubishi city multi PLFY-P015 | CEILING CASSETTE 24" x 24" | MEETING 224 | CU-1 / BC-2 | 18 | 20 | - | - | - | WASHABLE MESH | 0.5 | 208/1 | 50 | |

NOTES:

1. PROVIDE INDOOR UNITS WITH CONDENSATE PUMPS. 2. PROVIDE BAGNET INTERFACE. 3. INDOOR UNITS WITH SMART ME CONTROLLER.

| SYMBOL | BASIS OF DESIGN MANUFACTURER AND SERIES NO. | AREA SERVED | COOLING CAP | | HEATING CAPACITY | | MAX. WEIGHT LBS | UNIT ELECTRICAL | | | REMARKS |
|--|---|-------------|--------------|-----------------------|------------------|----------|-----------------------|-----------------|------|----------|---|
| | | | TOTAL MBH | EFF | MBH | EFF | | MCA | MOCp | VOLTS/PH | |
| CU-1 | mitsubishi city multi purv-ep-120tnu-a | SEE PLAN | 120 | 13.8 EER 30.1 IEER | 135 | 4.04 COP | 700 | 41 | 60 | 208/3 | HEAT RECOVERY TYPE, WITH TWINNING KIT, AE-200 CONTROL INTERFACE W/ BACNET |
| BC-1 | mitsubishi cmb-p108nu-kb1 | CU-1 | - | - | - | - | 100 | 0.8 | 20 | 208/1 | BC SUB CONTROLLER W/ SERVICE VALVES AND CONDENSATE PUMP |
| BC-2 | mitsubishi cmb-p1012nu-j1 | CU-1 | - | - | - | - | 150 | 1.1 | 20 | 208/1 | BC MAIN CONTROLLER W/ SERVICE VALVES AND CONDENSATE PUMP |
| * COOLING CAPACITY IS AHRI RATING: AT 80°F DB; 67°F WB INDOOR COIL EAT AND 95°F OUTDOOR COIL EAT. ** HEATING CAPACITY IS AHRI HI-TEMP RATING: AT 70°F DB INDOOR COIL EAT AND 47°F DB; 43°F WB OUTDOOR COIL EAT. | | | | | | | | | | | |

| SYMBOL | ZVD CALLOUT | BASIS OF DESIGN MANUFACTURER AND SERIES NO. | AREA SERVED | PRIMARY AIR | | INLET SIZE | P.D. @ MAX CFM | REHEAT COIL SIZE | | | REMARKS |
|---|----------------|---|--------------------------------|-------------|----------|---------------|-------------------|------------------|-----|---------|---------|
| | | | | MIN. CFM | MAX. CFM | | | MBH | GPM | P.D. FT | |
| VAV-36 | 18" | TITUS DESV-14 | LEVEL 2 | 1130 | 1890 | 14 | 0.04 | - | - | - | |
| VAV-38 | 14" | TITUS DESV-12 | LIBRARY STAFF BREAKROOM 230 | 720 | 1200 | 12 | 0.04 | - | - | - | |
| VAV-39 | 14" | TITUS DESV-10 | COMMON KITCHEN 209 | 620 | 1040 | 10 | 0.04 | - | - | - | |
| VAV-40 | 14" | TITUS DESV-12 | TENANT SPACE 207 | 740 | 1240 | 12 | 0.04 | - | - | - | |
| VAV-41 | 14" | TITUS DESV-12 | TENANT SPACE 205 | 740 | 1240 | 12 | 0.04 | - | - | - | |
| VAV-42 | 8" | TITUS DESV-5 | TENANT SPACE 203 | 150 | 250 | 5 | 0.04 | - | - | - | |
| VAV-43A | 10" | TITUS DESV-7 | TENANT SPACE 202 | 320 | 540 | 7 | 0.10 | - | - | - | |
| VAV-43B | 16" | TITUS DESV-14 | TENANT SPACE 201 | 970 | 1620 | 14 | 0.04 | - | - | - | |
| VAV-44 | 14" | TITUS DESV-10 | CIRCULATION 200 | 530 | 880 | 10 | 0.04 | - | - | - | |
| VAV-46A | 18" | TITUS DESV-12 | TENANT SPACE 206 | 790 | 1320 | 12 | 0.04 | - | - | - | |
| VAV-46B | 18" | TITUS DESV-16 | TENANT SPACE 208 | 1440 | 2400 | 16 | 0.04 | - | - | - | |
| NOTES <ol style="list-style-type: none"> NOT USED NOT USED MAX. NC=35 AT: 1.0" INLET STATIC PRESSURE, WITH 10' OF FLEX DUCT ATTENUATION, PLUS END REFLECTION DUE TO ENTERING A SLOT DIFFUSER, & A db ROOM EFFECT. | | | | | | | | | | | |



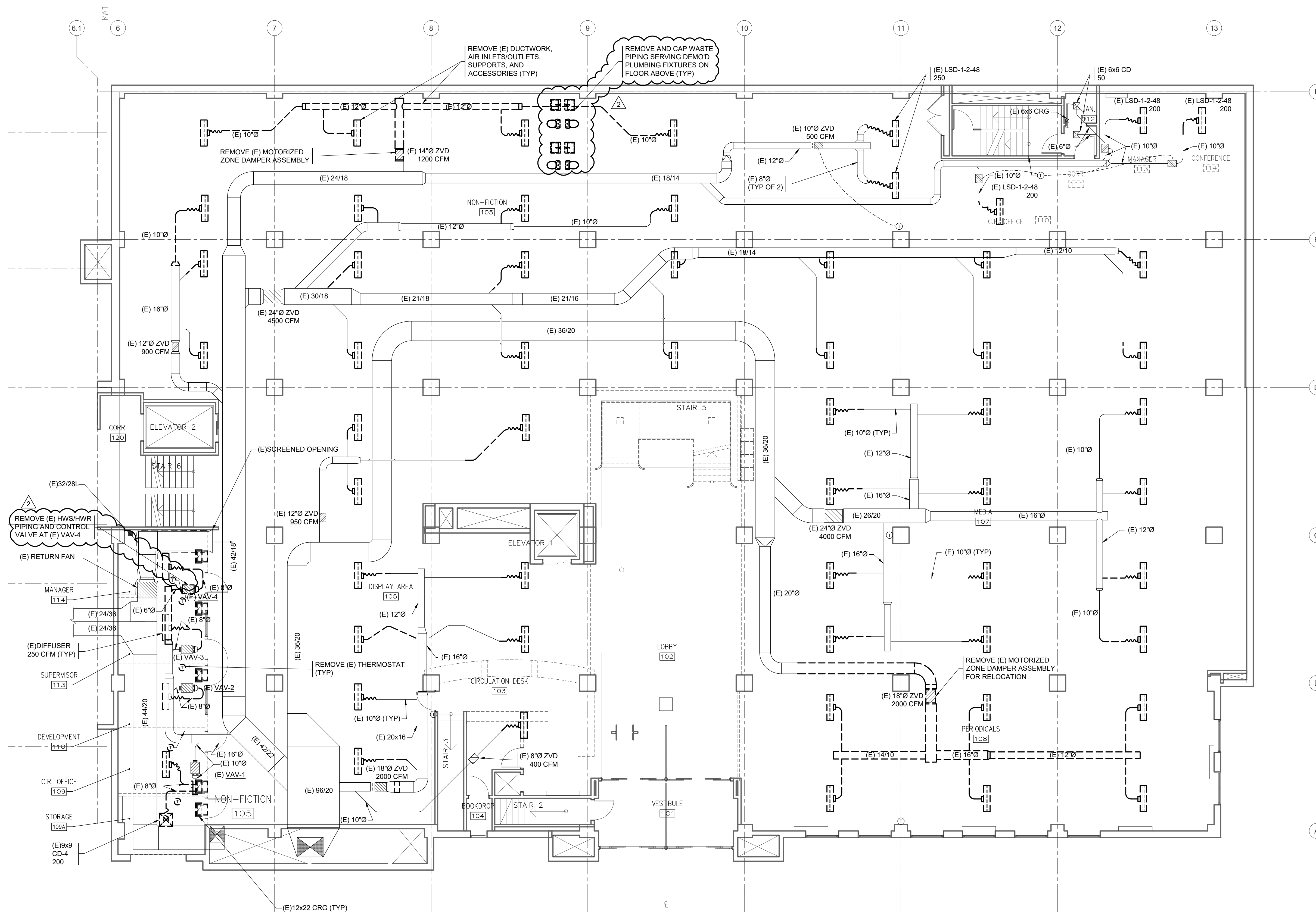
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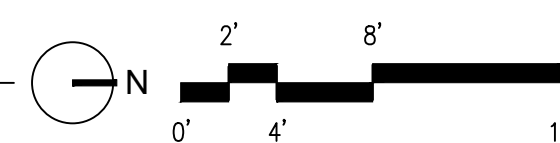
9-25-2023

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1. SEE GENERAL MECHANICAL DEMOLITION NOTES ON SHEET M002.
2. NOT ALL EXISTING PIPING IS SHOWN ON PLAN FOR CLARITY.




SCALE: 1/8"=1'-0"





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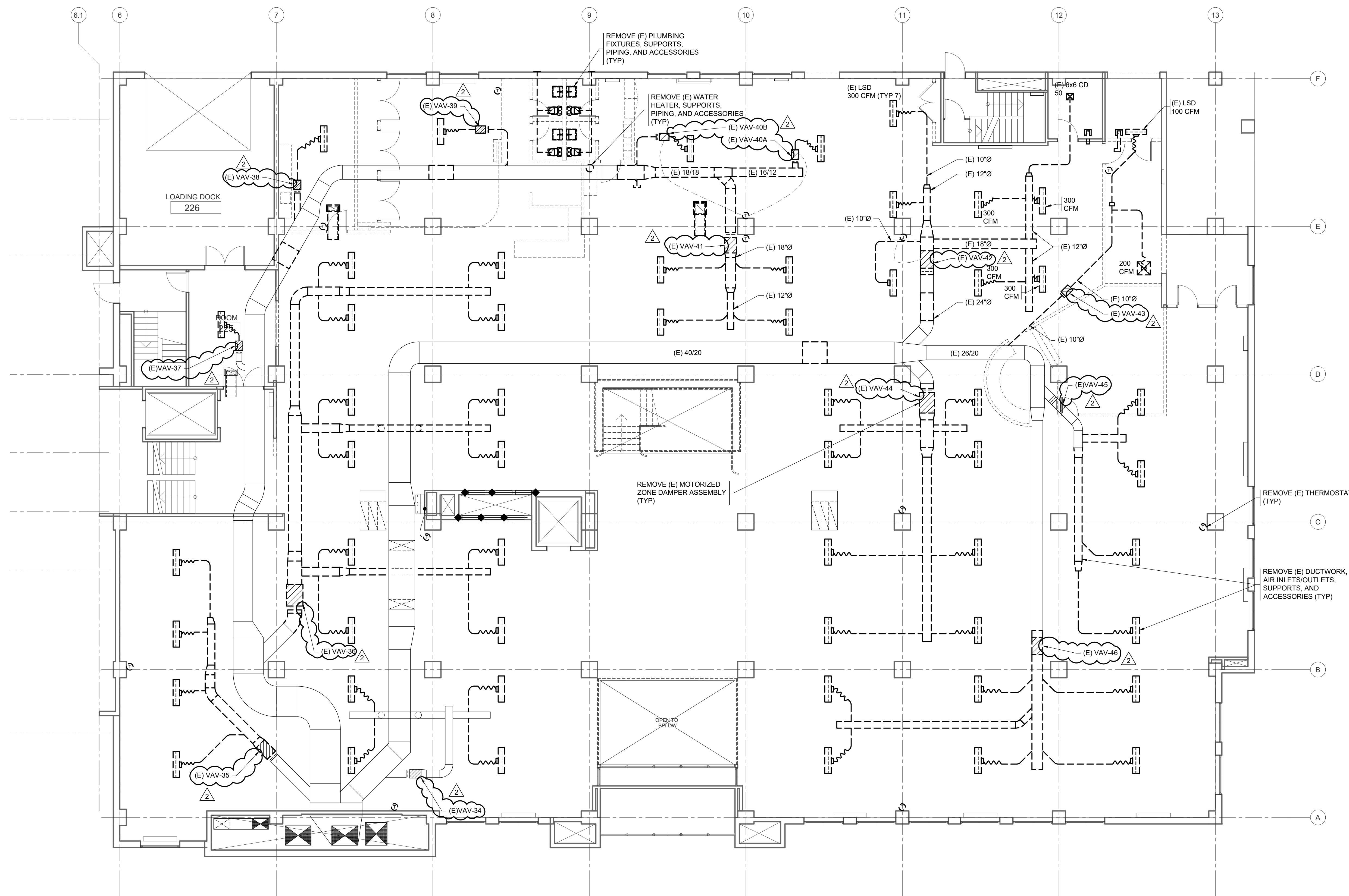
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09-25-2023

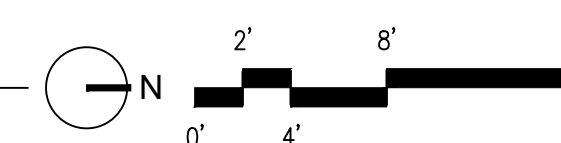
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general@hultzbhu.com Job Number: 22-22

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2. NOT ALL EXISTING PIPING IS SHOWN ON PLAN FOR CLARITY.



SCALE: 1/8"=1'-0"





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PROJECT
**Tacoma Public Library
Main Branch**

LOCATION
**1102 Tacoma Ave S
Tacoma WA 98402**

PREPARED FOR
**Tacoma Public
Library**

REVISION DATE NAME

2 9/25/23 Addendum 2

PROFESSIONAL STAMP



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engineers inc

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CARNEGIE, LEVEL 1 FLOOR
PLAN - MECHANICAL
DEMOLITION

08/07/2023

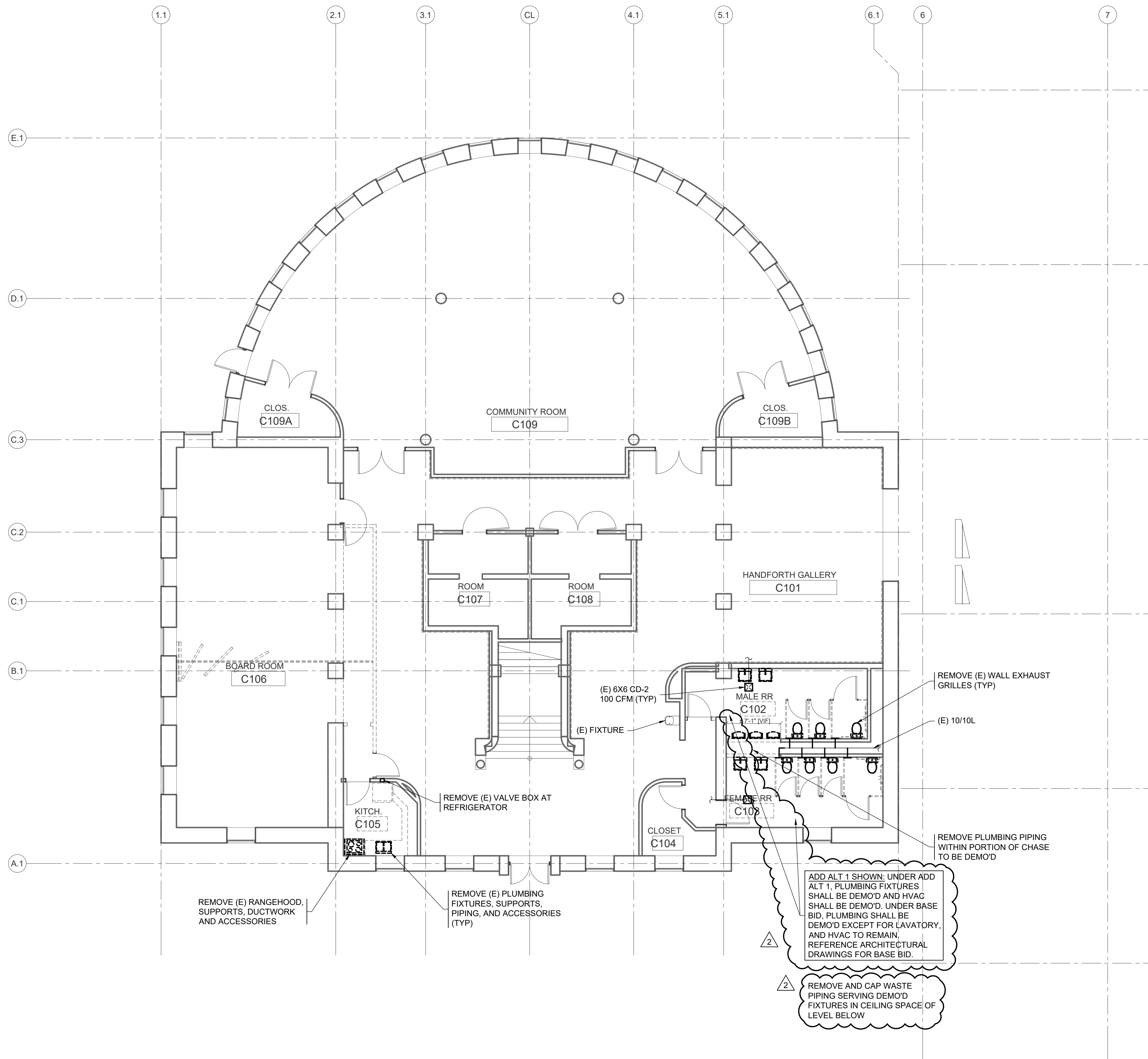
Bid Set

M104

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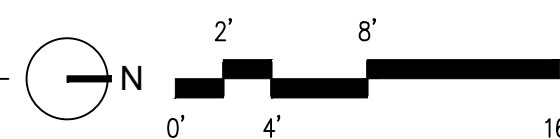
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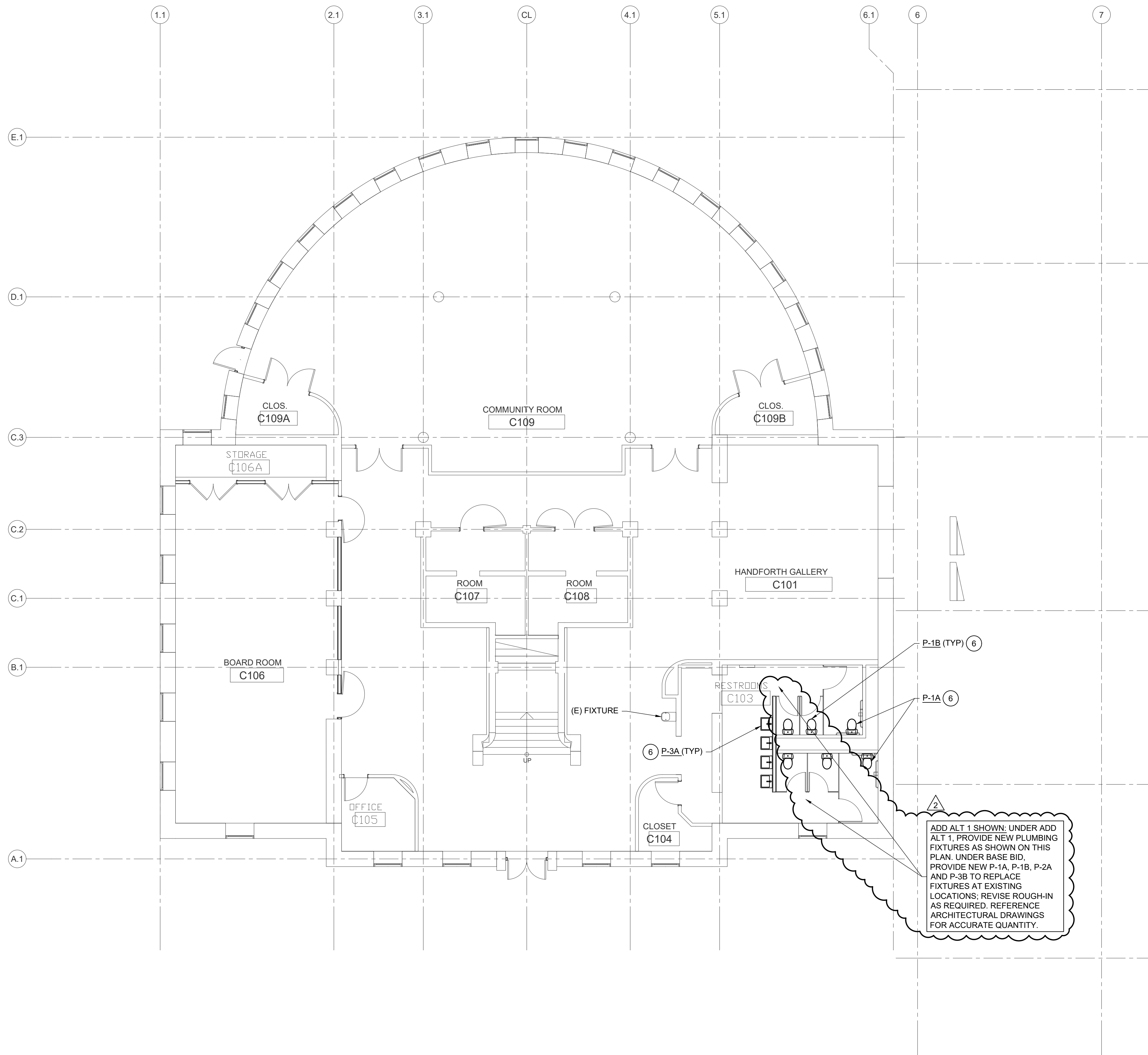
- SEE GENERAL MECHANICAL DEMOLITION NOTES ON SHEET M002.
- NOT ALL EXISTING PIPING IS SHOWN ON PLAN FOR CLARITY.



CARNEGIE, LEVEL 1 FLOOR PLAN - MECHANICAL DEMOLITION

SCALE: 1/8"=1'-0"





CARNEGIE, LEVEL 1 FLOOR PLAN - PLUMBING

SCALE: 1/8"=1'-0"

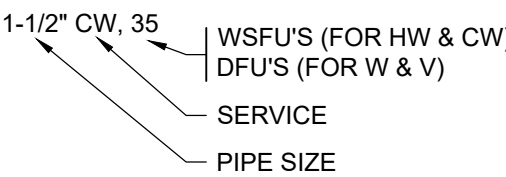
GENERAL NOTES:

1. SEE GENERAL MECHANICAL NOTES ON SHEET M002.
2. FOR PIPING SIZES TO INDIVIDUAL FIXTURES, SEE PLUMBING FIXTURE SCHEDULE ON SHEET M003.

KEYED NOTES:

- ① 1/2"CW UP TO TRAP PRIMER VALVE. SEE DETAIL 3 ON SHEET M311.
- ② EXTEND HW LOOP DOWN IN WALL TO WITHIN 4" OF FIXTURE STOP. CONTINUE LOOP TO OTHER FIXTURES.
- ③ 1/2" TRAP PRIMER LINE.
- ④ 1/2"HW, 1-1/2"W. CONNECT TO PIPING SERVING ADJACENT SINK. PROVIDE AIR GAP FITTING AT WASTE CONNECTION.
- ⑤ CLEAN EXISTING SUMP. APPLY MASTIC SEALANT TO SUMP FLOOR AND WALLS. PROVIDE NEW GASKETED STEEL COVER FOR EXISTING SUMP. SET NEW PUMPS IN EXISTING SUMP.
- ⑥ CONNECT TO HW/CW/W/V PIPING THAT SERVED REMOVED FIXTURES.
- ⑦ MOUNT ABOVE T-BAR CEILING ADJACENT TO PLUMBING CHASE. PROVIDE WIRING FROM TRANSFORMER TO WATER CLOSET AND LAVATORY SENSORS.

PIPE SIZING LEGEND:



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PROJECT
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Main Branch**

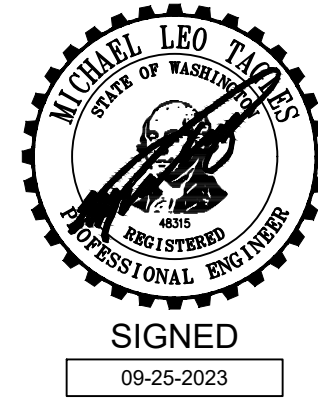
LOCATION
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PREPARED FOR
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CARNEGIE, LEVEL 1 FLOOR
PLAN - PLUMBING

08/07/2023

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M304

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PROJECT
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Main Branch**

LOCATION
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PREPARED FOR
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REVISION DATE NAME

2 9/25/23 Addendum 2

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MAIN BUILDING, LEVEL 2
FLOOR PLAN - HVAC

08/07/2023

Bid Set

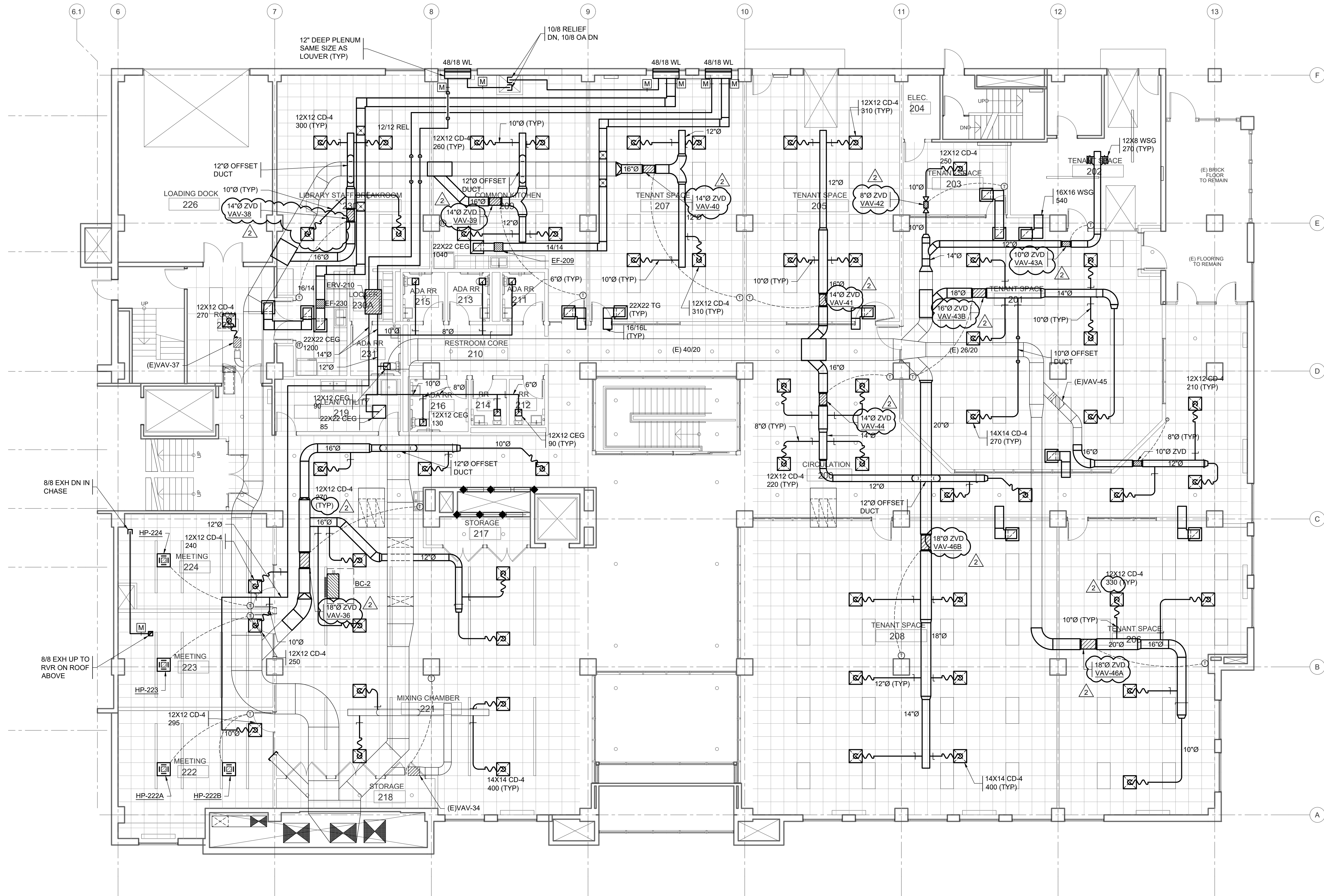
M402

GENERAL NOTES:

- SEE GENERAL MECHANICAL NOTES ON SHEET M002.
- AIR INLET/OUTLET LOCATIONS SHOWN ON THE PLANS ARE PRELIMINARY. HVAC CONTRACTOR SHALL COORDINATE FINAL LOCATIONS OF AIR INLETS/OUTLETS WITH OTHER TRADES PRIOR TO INSTALLATION.
- REFRIGERANT PIPING: CONTRACTOR SHALL COORDINATE AND FIELD LOCATE. SEE EQUIPMENT SCHEDULE FOR MINIMUM SIZE.
- EXPOSED DUCTS: SHALL BE RAN NEATLY, WITH CLEAN JOINTS. JOINTS SHALL BE FLANGED OR WITH TAPED OFF DUCT SEALANT, READY FOR PAINTING.
- NOT ALL KEYED NOTES ARE USED ON EACH SHEET.

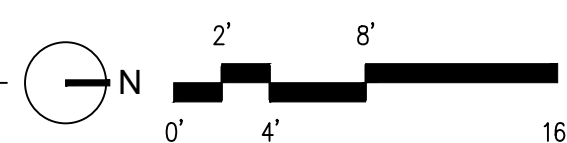
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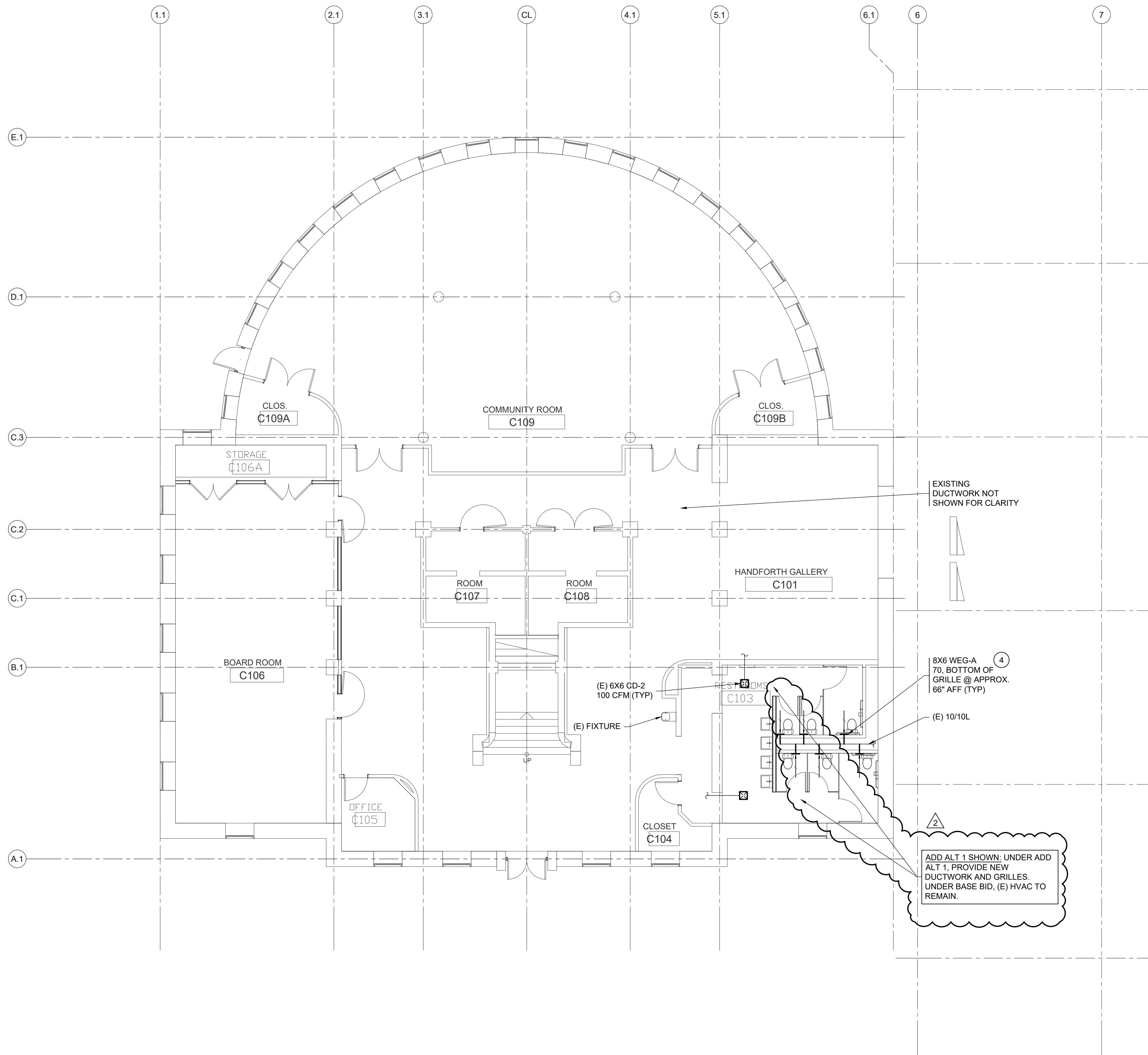
- ROUTE TIGHT TO BOTTOM OF STRUCTURE.
- UNDERCUT DOOR.
- OFFSET DOWN THROUGH LID.
- CONNECT W/ 10/4 TO EXISTING 10/10L LOCATED IN CHASE WALL.
- CONNECT NEW TO EXISTING. FIELD VERIFY DUCT SIZE. FOR BIDDING PURPOSES, ASSUME 12"Ø.



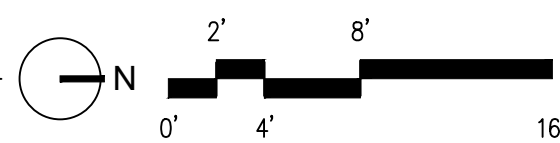
MAIN BUILDING, LEVEL 2 FLOOR PLAN - HVAC

SCALE: 1/8"=1'-0"





CARNEGIE, LEVEL 1 FLOOR PLAN - HVAC
SCALE: 1/8"=1'-0"



GENERAL NOTES:

1. SEE GENERAL MECHANICAL NOTES ON SHEET M002.
2. AIR INLET/OUTLET LOCATIONS SHOWN ON THE PLANS ARE PRELIMINARY. HVAC CONTRACTOR SHALL COORDINATE FINAL LOCATIONS OF AIR INLETS/OUTLETS WITH OTHER TRADES PRIOR TO INSTALLATION.
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5. NOT ALL KEYED NOTES ARE USED ON EACH SHEET.

KEYED NOTES:

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- ② UNDERCUT DOOR.
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CARNEGIE, LEVEL 1 FLOOR
PLAN - HVAC

08/07/2023

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M404

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