GALLAGHER

ADDENDUM NO. 2

TO THE CONTRACT DOCUMENTS FOR:

CRANDALL ISD – PERFORMING ARTS CENTER ADDITION TO CRANDALL HIGH SCHOOL

SEPTEMBER 5, 2024

GENERAL CLARIFICATIONS TO ALL PROPOSERS

1. **CRANDALL ISD – PERFORMING ARTS CENTER ADDITION TO CRANDALL HIGH SCHOOL – DLR GROUP - ADDENDUM NO. 2:** The attached Addendum No. 2 to the Drawings and Specifications for Crandall ISD – Performing Arts Center Addition To Crandall High School, as prepared by DLR Group and dated September 3, 2024 is included in this Addendum and shall become a part of the Contract Documents for this project.

2. **BID DATE:** The project "Proposal Due" remains **2:00 PM, on September 12, 2024**

3. **A REMINDER TO EACH BIDDER: Please review the Gallagher "Contract Conditions and CSP Package Scope of Work" specification Volume #1 in its entirety.**
   a. **Reference the bid package as it pertains to your scope, submit your proposal on the bid form provided within this specification.**
   b. **Include the performance & payment bond costs in your proposal pricing (if proposal is at/more than $25,000).**
   c. **If a contractor is awarded a CSP package by the owner, contractors will be required to provide the performance & payment bond within 5 days of receiving the contract.**

CLARIFICATIONS AND CHANGES TO SECTION 01 81 00 SCOPE OF WORK

1. **CLARIFICATION TO ALL CSP BID PACKAGES:**
   a. Replace Spec Section 00 01 00 – Table Of Contents
   b. Please see attached RFI Log
   c. Please see revised 00 41 00 CONSTRUCTION PROPOSAL FORM. The CSP Contractor shall provide breakout pricing for the **NEW PERFORMING ARTS CENTER (AREA A)** and the **RENOVATION AREA (AREA B)** as indicated on the 00 41 00-Construction Proposal Form. All proposal amounts shall include all applicable bond costs and allowances where applicable. These breakouts are for accounting purposes only, each CSP package will be awarded for all project areas combined, not separately.

2. **CLARIFICATIONS TO CSP BID PACKAGE 09-H RESILIENT SHEET FLOORING:**
   a. Remove 09-H - Resilient Sheet Flooring in Gallagher Volume 1 Book in its entirety.

3. **CLARIFICATION TO CSP BID PACKAGE 12-D – WINDOW TREATMENTS :**
   a. Remove 12-D – Window Treatments in Gallagher Volume Book 1 in its entirety.

4. **CLARIFICATION TO CSP BID PACKAGE 27-C – COMMUNICATION SYSTEMS:**
   a. Replace Spec Section 22 05 18 – Escutcheons For Plumbing Piping in its entirety.

5. **CLARIFICATION TO CSP BID PACKAGE 10-A, BUILDING SPECIALTIES:**
   a. Remove General Scope Provision #29 – Display Cases in Gallagher Volume 1 Book in its entirety. Per RFI #28 response, display cases will be field built. BP-06-A Millwork, 08-B Glass & Glazing, 09-A – Drywall refer to 06-A Millwork #31 Display Case Clarification for scopes of responsibility.

6. **CLARIFICATION TO CSP BID PACKAGE 08-A, FRAMES DOORS AND HARDWARE:**
   a. Add to General Scope Provision #29 – All hollow metal STC rated frames per Interior Window Schedule to be inclusive of this bid package.

7. **CLARIFICATION TO CSP BID PACKAGE 08-B, GLASS & GLAZING:**
   a. Add to General Scope Provision #28 – All aluminum STC rated frames per Interior Window Schedule to be inclusive of this bid package.

8. **CLARIFICATIONS TO SPEC SECTION 03 30 00, CAST-IN-PLACE CONCRETE:**
   a. Remove and replace Spec Section 03 30 00 Cast-In Place Concrete in its entirety.

9. **CLARIFICATIONS TO SPEC SECTION 08 71 00, DOOR HARDWARE:**
   a. Remove and replace Spec Section 08 71 00 Door Hardware in its entirety.

10. **CLARIFICATIONS TO SPEC SECTION 11 61 23, DRAPERY AND TRACK:**
    a. Remove and replace Spec Section 11 61 23 Drapery And Track in its entirety.

11. **CLARIFICATIONS TO SPEC SECTION 11 61 33, MOTORIZED RIGGING:**
    a. Remove and replace Spec Section 11 61 33 Motorized Rigging in its entirety.

12. **CLARIFICATIONS TO SPEC SECTION 11 61 36, COUNTERWEIGHT RIGGING:**
    a. Remove and replace Spec Section 11 61 36 Counterweight Rigging in its entirety.

13. **CLARIFICATIONS TO SPEC SECTION 11 61 39, FIRE SAFETY CURTAIN:**
    a. Remove and replace Spec Section 11 61 39 Fire Safety Curtain in its entirety.

14. **CLARIFICATIONS TO SPEC SECTION 11 61 63, ORCHESTRA SHELL:**
    a. Remove and replace Spec Section 11 61 63 Orchestra Shell in its entirety.

End of Gallagher Addendum No. 2

GALLAGHER

RFI LOG: CRANDALL ISD - PERFORMING ARTS CENTER ADDITION TO CRANDALL HIGH SCHOOL

DATE: 9/4/2024

DATE	RFI #	CONTRACTOR	CSP/TRADE	REFERENCE	RFI QUESTION	DATE2	ANSWERED BY	ANSWER
7/30/2024	1				Sheet C1.02 shows four islands in the parking lot to be sawcut and removed. Sheet L1.01 shows seven island to receive new concrete finishes. What scope of work needs to be performed at the three additional islands shown to receive new concrete finishes ?	8/15/2024	CL	Four islands will be removed to replace the concrete curbs. The islands shown without sawcut will keep the existing curb, and the banded concrete will be poured within the existing curbed areas. The banded concrete within all seven islands will ultimately look the same, the only difference is whether the existing curb will remain.
7/30/2024	2				Sheet C1.03 there is a callout for retaining walls at the loading dock drive. Sheet AS1.2 shows the retaining wall layout. Sheet S1.1A - Foundation Plan - Level 1 Area A does not call out the retaining walls. Please provide structural details for the footings and walls.	8/15/2024	CL	Sheet C1.14 shows footing detail information in the detail titled "LOADING DOCK WALLS".
7/30/2024	3		Masonry		Sheets A6.1 & A6.2 call for a BB-1 Brick Blended. 042000 / 2.5 / B - Clay Face Brick & C - Perforated Clay Face Brick call for color as selected by architect. Which color an from what manufacturer are these to be coming from. Please provide.	8/15/2024	CL	Weatherwood Gray
7/30/2024	4		Millwork		Sheet A2.16 - at Dressing Rooms A128, Elev 2C & Dressing Room A129, Elev 1C, there are what look to be, wardrobe storage units. There is no callout for what the finish is for these. Is this what spec section 064116 is for ?	8/15/2024	CL	Yes, spec section 064116 refers to this millwork - finish is PLAM. Please assume closure panel matching cabinetry from top of cabinet to underside of ceiling.
7/31/2024	5		Wood Door Frames		There are seven locations that are scheduled for wood door frames : A111 A146A, A206B, A208B. These are S/L Lock to Auditorium locations. A207 is to the Control Room. A101M & A101N are 3'-1" x 4'-0" openings that are not on the plans. Please verify that these are to be wood frames ? Where are A101M & A101N located ?	8/15/2024	CL	No wood door frames, hollow metal painted. a101M & a101N are located at concessions.
7/31/2024	6		Aluminum Door Frames		There are twelve locations that are scheuled for aluminum door frames: A109 Custodial Closet, A111B - S/L Lock to Auditorium, A117A - Stage Access, A121A - Stage Entrance, A124B - Band Storage, A125 - Costume Storage, A143A - Sound & Lighting Storage, A146B - S/L Lock to Auditorium, A203 - Custodial Closet, A206A - S/L Lock to Auditorium, A208A - S/L Lock to Auditorium & A300A - Electrical Closet. Please verify that these are to be aluminum door frames.	8/15/2024	CL	No aluminum door frames, all hollow metal.
7/31/2024	7		Room A207		Room A207 - Projection Control Room - Interior Elevation callouts shown are for A103 Concession / Box Office. Please provide interior elevations for A207.	8/15/2024	CL	To be addressed in coming addendum.
7/31/2024	8		Rolltop Assembly		Sheet A11.4 / Detail 4D - Auditorium Rolltop Counter Section - Is this actually inclusive to this project ? Please provide a location for this detail, if so, showing the actual size, along with a specific manufacturer and model number, other than basis of design.	8/15/2024	CL	Yes, it is applicable to be located in coming addendum.
8/1/2024	9		Acoust. Ceil.		Sheet A3.2A - A207 - Projection / Control Rm - Ceiling callout is for APC-03. There is no APC-03 on the finish schedule. Should this be APC-02 ? Please advise.	8/15/2024	CL	Ceiling in A207 Projection Control Room will be APC-02, team will update drawings in coming addendum.
8/5/2024	10		Floor Base		Sheet A12.1A - Unisex Toilet A138 - B-01 - Resilient Base is called out for this toilet room. Is this correct ? Please verify.	8/15/2024	CL	Base in A138 is B-02, team will update drawings in coming addendum.
8/5/2024	11		Display Cases		Spec Section 10 12 00 / 2.3 Display Cases calls out a specific manufacturer with specific KV shelf brackets. On plan sheet A11.5 / 5A, this detail shows a field built display case with a different KV bracket. Are these display cases to be prefabricated units or field built ? Please advise.			These cases will be field built.
8/7/2024	12		Signage		Please provide signage schedule showing sizes and types.	8/22/2024	CL	To be addressed in future addendum.
8/7/2024	13		Plaques		Please provide size of plaque to be priced.	8/22/2024	CL	To be addressed in future addendum.
8/7/2024	14		Dimensional Letter Signage		10-14-19 Calls for this signage to be illuminated, Please identify which electrical circuit is designated for this exterior signage to be illuminated. Please provide letter sizes.	8/28/2024	CL	Please clarify what "10-14-19" refers to. Letter sizes will be "Crandall High School" in 12" lettering and "Performing Arts Center" in 10" lettering. Electrical circuits to be added in coming addendum.

8/7/2024	15		School Logos		3A/A4.1 & 3A/A4.2 show school logos. Please provide material type that these are to be manufactured in and any other pertinent info for pricing.	8/22/2024	CL	To be addressed in future addendum.
8/7/2024	16		Audience Seating		Sheet A2.6 shows each row with a number. These numbers total 778, which was the seat count on the 75% CD drawings. The actual seat count on the 100% CD drawings is 816. Which count is correct ? Please advise.	8/22/2024	CL	Seat count is 814, including ADA seating.

Contractor Name: Initials:

00 41 00 - CONSTRUCTION PROPOSAL FORM – ADDENDUM NO. 2

ALL PAGES MUST BE COMPLETED AND INITIALED!

PROJECT: CRANDALL ISD - PERFORMING ARTS CENTER ADDITION
CRANDALL INDEPENDENT SCHOOL DISTRICT, CRANDALL, TX

TO: CRANDALL INDEPENDENT SCHOOL DISTRICT
400 WEST LEWIS STREET,
CRANDALL, TEXAS 75114

FROM:

CONTRACTOR NAME: _____

PHYSICAL ADDRESS: _____

CITY, STATE, ZIP: _____

AREA CODE / PHONE: _____

CONTACT NAME: _____

E-MAIL ADDRESS: _____

ORGANIZATION OPERATING AS:

- ☐ Corporation, organized under laws of the State of _____
- ☐ Partnership
- ☐ Individual
- ☐ Joint Venture consisting of the firms of: _____
- ☐ Other (specify): _____

ADDENDUM ACKNOWLEDGMENT (the undersigned acknowledges receipt of the following addenda):

ADDENDUM NO.	DATE	ADDENDUM NO.	DATE
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

PROPOSER PROPOSES:

In response to the Advertisement to submit a PROPOSAL for the execution of the Work described by the Drawings and Specifications entitled **CRANDALL ISD - PERFORMING ARTS CENTER ADDITION** and having examined the site where the work is to be performed and being familiar with local conditions as they might in any way affect the cost and/or execution of the Work and having carefully examined all of the Drawings, Specifications, Request for Proposal Scope of Work and other related documents and Addendum(s) thereto, the undersigned Proposer agrees to provide all labor, materials, equipment and services including transportation and other facilities as may be required for the complete and satisfactory execution of the Work for which this Proposal is submitted for the lump-sum consideration as stated hereinafter.

Contractor Name: Initials:

Note: All Proposal amounts shall include all applicable bond costs.
Proposers shall provide a cost breakdown for each area for accounting purposes only.
Each contractor will be awarded all areas as one contract only, not separately.

CSP #	DESCRIPTION		New Performing Arts Center (Area A) (including bonds)	Renovation Area (Area B) (including bonds)	TOTAL Must Equal All Areas (including bonds)
CSP 01-B	Final Building Cleaning	$			
CSP 02-A	Demolition	$			
CSP 03-A	Building Concrete	$			
CSP 03-D	Concrete Sealing, & Polishing	$			
CSP 04-A	Masonry	$			
CSP 05-A	Structural Steel and Erection	$			
CSP 06-A	Millwork	$			
CSP 07-A	Roofing and Sheet Metal	$			
CSP 07-C	Sprayed-On Fireproofing & Sprayed Insulation	$			
CSP 08-A	Frames, Doors & Hardware	$			
CSP 08-B	Glass & Glazing	$			
CSP 08-C	Overhead Coiling Doors & Dock Equipment	$			
CSP 09-A	Drywall & Acoustical	$			
CSP 09-C	Tiling	$			
CSP 09-D	Floor Coverings	$			
CSP 09-E	Painting & Wallcovering	$			
CSP 09-G	Wood Flooring - Stage & Lobby	$			
CSP 09-I	Terrazzo	$			
CSP 10-A	Building Specialties	$			
CSP 10-G	Identification Devices	$			
CSP 11-C	Stage Equipment, Curtains, and Lighting	$			

Contractor Name: Initials:

Note: All Proposal amounts shall include all applicable bond costs.
Proposers shall provide a cost breakdown for each area for accounting purposes only.
Each contractor will be awarded all areas as one contract only, not separately.

CSP #	DESCRIPTION		New Performing Arts Center (Area A) (including bonds)	Renovation Area (Area B) (including bonds)	TOTAL Must Equal All Areas (including bonds)
CSP 12-C	Auditorium Seating	$			
CSP 12-F	Music Storage Equipment	$			
CSP 14-A	Elevator(s)	$			
CSP 21-A	Fire Sprinkler System	$			
CSP 22-A	Plumbing	$			
CSP 23-A	HVAC	$			
CSP 26-A	Electrical	$			
CSP 27-A	Voice and Data Cabling	$			
CSP 27-B	Audio/Visual Systems	$			
CSP 28-A	Fire Alarm Systems	$			
CSP 31-A	Excavation	$			
CSP 31-E	Termite Control	$			
CSP 32-A	Concrete Paving	$			
CSP 32-B	Landscaping & Irrigation	$			
CSP 33-A	Site Utilities	$			

COMBINATION PROPOSALS

This section is intended for Cost Saving combined pricing, if a Contractor is Awarded multiple CSP Packages.

CSP Package No.	CSP Package No.	CSP Package No.	CSP Package No.
_____	_____	_____	_____

TOTAL COMBINATION PROPOSAL AMOUNT $ _____

ALTERNATES
REFER TO SPECIFICATION SECTION 01 23 00 FOR COMPLETE DESCRIPTION

ALTERNATE #1
HVAC, PACKAGED ROOF-TOP UNIT, OPTIONS
(BASE BID TO BE DAIKIN)

THESE MANUFACTURERS/PRICING/DATES MAY BE USED IN DETERMINING THE BEST VALUE FOR THE OWNER

(PROVIDE DATES BASED ON **10/7/2024** NOTICE TO PROCEED)

CSP PACKAGE	MANUFACTURER (write-in)	ADD / DEDUCT $	ON-SITE DELIVERY DATE
CSP# 23-A	_____	$_____	_____
CSP# 23-A	_____	$_____	_____
CSP# 23-A	_____	$_____	_____
CSP# 23-A	_____	$_____	_____

ALTERNATE #2
EXPEDITE DELIVERY OF SPECIFIED SWITCHBOARD "DP1K"

CSP PACKAGE #__26-A__ ADD $ _____

REQUEST FOR EXPEDITED MATERIAL DELIVERY DATES

THESE DATES/DAYS MAY BE USED IN DETERMINING THE BEST VALUE FOR THE OWNER

(PROVIDE DATES/DAYS BASED ON **10/7/2024** NOTICE TO PROCEED)

EXPEDITED MAIN SWITCHGEAR ON-SITE DATE: _____

Contractor Name: Initials:

SUPPLEMENTAL PRICING REQUESTED			
Unit Pricing: This proposal contractor shall furnish a per day price for cranes. *(price includes all labor, materials, equipment, overhead, profit, taxes, insurance, bonds, etc.)*			
CSP 05-A	ADD/DEDUCT	$	Per Day
Unit Pricing: This proposal contractor shall furnish a per hour price for crane downtime. *(price includes all labor, materials, equipment, overhead, profit, taxes, insurance, bonds, etc.)*			
CSP 05-A	ADD/DEDUCT	$	Per Hour
Unit Pricing: This proposal contractor shall furnish a per hour price for erectors. *(price includes all labor, materials, equipment, overhead, profit, taxes, insurance, bonds, etc.)*			
CSP 05-A	ADD/DEDUCT	$	Per Hour
Unit Pricing: This proposal contractor shall furnish a per week price for Auditorium scaffold rental. *(price includes all labor, materials, equipment, overhead, profit, taxes, insurance, bonds, etc.)*			
CSP 09-A	ADD/DEDUCT	$	Per Week
Unit Pricing: This proposal contractor shall furnish a per bag price to install latex floor leveling compound. *(price includes all labor, materials, equipment, overhead, profit, taxes, insurance, bonds, etc.)*			
CSP 09-C / CSP 09-D / CSP 09-G / CSP 09-H	ADD/DEDUCT	$	Per 50 lb. Bag
Unit Pricing: This proposal contractor shall furnish a per bag price to install feather finish floor leveling compound. *(price includes all labor, materials, equipment, overhead, profit, taxes, insurance, bonds, etc.)*			
CSP 09-C / CSP 09-D / CSP 09-G / CSP 09-H	ADD/DEDUCT	$	Per 10 lb. Bag
Unit Pricing: This proposal contractor shall furnish a per square foot price for Moisture Vapor Emission Control System. *(price includes all labor, materials, equipment, overhead, profit, taxes, insurance, bonds, etc.)*			
CSP 09-C / CSP 09-D / CSP 09-G / CSP 09-H	ADD/DEDUCT	$	Per Square Foot
Unit Pricing: This proposal contractor shall furnish per drop price for Data Drops. *(price includes all labor, materials, equipment, overhead, profit, taxes, insurance, bonds, etc.)*			
CSP 27-A	ADD/DEDUCT	$	Per Data Drop
Unit Pricing: This proposal contractor shall furnish a per yard price Bermuda Grass Hydromulch. *(price includes all labor, materials, equipment, overhead, profit, taxes, insurance, bonds, etc.)*			
CSP 32-B	ADD/DEDUCT	$	Per Square Yard
Unit Pricing: This proposal contractor shall furnish a per yard price Solid Sod Bermuda Grass. *(price includes all labor, materials, equipment, overhead, profit, taxes, insurance, bonds, etc.)*			
CSP 32-B	ADD/DEDUCT	$	Per Square Yard

PIER PRICING

UNIT PRICES FOR PIERS: Unit prices include all materials, equipment, labor, insurance, overhead, profit, warranties, etc. to perform the required work according to the Project Documents (Lineal foot adjustments by Geotechnical Engineer: Adjustments determined on total estimated quantity and not per individual pier. Deduct amount shall not be less than 60% of Add amount).

ADD			**DEDUCT**			**ADD/DELETE CASING**		
18″	$	/LF	18″	$	/LF	18″	$	/LF
24″	$	/LF	24″	$	/LF	24″	$	/LF
30″	$	/LF	30″	$	/LF	30″	$	/LF
36″	$	/LF	36″	$	/LF	36″	$	/LF
42″	$	/LF	42″	$	/LF	42″	$	/LF
48″	$	/LF	48″	$	/LF	48″	$	/LF

Contractor Name: Initials:

CSP 05-A, STRUCTURAL STEEL & ERECTION – BASE BID
REQUEST FOR DELIVERY DATES

THESE DATES MAY BE USED IN DETERMINING THE BEST VALUE FOR THE OWNER
(PROVIDE DATES BASED ON **10/7/2024** NOTICE TO PROCEED)

	Start Date	Duration
AB/Embed Shop Drawing Delivery:	_____	_____
Joist/Deck Shop Drawing Delivery:	_____	_____
Structural Steel Shop Drawing Delivery:	_____	_____
Misc. Steel Shop Drawing Delivery:	_____	_____
Anchor Bolts/Embed Delivery:	_____	_____
Structural Steel Delivery:	_____	_____
Roof Joist/Deck Delivery:	_____	_____
Miscellaneous Steel Delivery:	_____	_____
Proposed Steel Erector:	_____	_____
Second Proposed Steel Erector:	_____	_____
Additional Cost for Second Proposed Steel Erector:	_____	_____

CSP 23-A – HVAC, ROOF TOP UNITS – BASE BID TO BE DAIKIN – BASE BID
REQUEST FOR MATERIAL DELIVERY DATES

THESE DATES/DAYS MAY BE USED IN DETERMINING THE BEST VALUE FOR THE OWNER
(PROVIDE DATES/DAYS BASED ON **10/7/2024** NOTICE TO PROCEED)

HVAC EQUIPMENT ON-SITE DATE: _____

CSP 26-A – ELECTRICAL – SWITCHBOARD "DP1K" – BASE BID
REQUEST FOR MATERIAL DELIVERY DATES

THESE DATES/DAYS MAY BE USED IN DETERMINING THE BEST VALUE FOR THE OWNER
(PROVIDE DATES/DAYS BASED ON **10/7/2024** NOTICE TO PROCEED)

SWITCHBOARD "DP1K" ON-SITE DATE: _____

CSP 32-B – RE-VEGETATION OF DISTURBED AREAS – BASE BID
REQUEST FOR BREAKOUT VALUE

THIS BREAKOUT VALUE MAY BE USED IN DETERMINING THE BEST VALUE FOR THE OWNER

RE-VEGETATION BREAKOUT VALUE: $ _____

Contractor Name: Initials:

LABOR UNIT PRICING				
Each Proposal Contractor shall submit hourly rates for field labor for this project: *(unit price includes all labor, overhead, profit, taxes, insurance, bonds, etc.)*				
		REGULAR	OVERTIME	
CSP _____	GENERAL LABOR	$	$	Per Hour
CSP _____	APPRENTICE/HELPER	$	$	Per Hour
CSP _____	JOURNEYMAN/MECHANIC	$	$	Per Hour
CSP _____	SUPERVISOR/FOREMAN	$	$	Per Hour

GENERAL:

No modifications, additions or deletions shall be made to this Construction Proposal Form. In submitting this Proposal Proposer represents that all materials, equipment, and services associated with the Work as well as the terms and conditions of the proposed contract shall be in strict conformance with the Project Documents on which this Proposal is based.

The Proposer agrees that a complete set of Contract Documents (specifications, plans, addendums, etc.) have been reviewed before submitting this Proposal.

The Proposer agrees that if a POST PROPOSAL CONFERENCE INTERVIEW is extended to the Proposer it will, in a diligent manner, forward a recent AIA Document A305 Contractor's Qualification Statement and a Sample Certificate of Insurance to the Owner's Representative prior to the Scheduled meeting Time.

The Proposer agrees that if notice of award is extended to the Proposer it will, in a diligent manner, execute the Contract Form as identified within the project manual without modification and deliver the required:

- Contract,
- Surety Bonds that are in compliance with Chapter 2253 of the Texas Government Code, and
- Insurance Certificates that are in compliance with the Owner's stated requirements.

within five (5) days following presentation of the Contract.

The Proposer agrees that this Proposal shall not be withdrawn for a period of sixty (60) days after it has been opened without the express permission of the Owner.

The Proposer understands that the Owner reserves the right to reject any or all Proposals, to waive informalities in connection therewith, and to award the Contract for any of the Work or the project as a whole.

In submitting this Proposal the Proposer represents that no person, persons or company other than the firm listed below or otherwise indicated hereinafter has any interest whatsoever in this Proposal or the Contract that may be entered into as a result thereof.

The Proposer further represents that the proposing entity has complied with all City, County, State and Federal regulations for conducting the business operations for which it has Proposal and will be in full legal compliance therewith if awarded the Contract.

The undersigned agrees to complete all the Work within time limits after the date of the Notice to Proceed according to the substantial completion time set forth and that if the Work is not complete within the time limit set forth the Owner may assess liquidated damages pursuant to each individual Request for Proposal.

The undersigned declares that the person(s) signing this Proposal is fully authorized to sign on behalf of the named firm and to fully bind the firm to all conditions and provisions thereof.

DATE SUBMITTED: _____

FIRM: _____

Contractor Name: Initials:

BY (SIGNATURE): _____

PRINT SIGNATURE: _____

TITLE: _____

NAME/TITLE OF PERSON AUTHORIZED TO EXECUTE CONTRACT: _____/_____

AUTHORIZED PERSON E-MAIL ADDRESS: _____

ATTACHMENTS:

☐ CONFLICT OF INTEREST FORM

☐ W9 FORM

CRANDALL ISD PERFORMING ARTS CENTER ADDITION TO CRANDALL HIGH SCHOOL

PRE-BID MEETING, SIGN-IN SHEET **Wednesday, August 28, 2024** **@ 11:00:00 AM**

BID DATE: **Tuesday, September 12th, 2024 @ 2:00 PM**

Name	Company	Email	Phone
RUSSELL BUCHANAN JR	DLR GROUP	rbuchanan	314.568.0176
Courtney Larson	DLR Group	clarson@dlrgroup.com	
Becky Orr	UES	borr@teamues.com	817-319-2359
Cam Smith / Ryan Williams	Climatec	casmith@climatec.com	682-419-9052
Paige Norman	Nations Roof	pnorman@nationsroof.com	214-662-5679
Adam Mercer	~~AMercer~~ Nations Roof	Amercer@nationsroof.com	817-374-7855
Joe Stiles	P.K. Haney Roofing	JoeS@PKhaneyroofing.com	682-777-1749
Eric Keierleber	Intex Electric	eric@intexelectric.com	972-248-8011
MJ URZAIZ	URZAIS Electric	MJURZAIZ@URZAISELECTRIC	469.282.877
Shane Whittiker	Premiere Roofing	shane@premireroofing.net	972 489 9028
Jason Lee	Sun Drywall	Jason@sundrywalldfw.com	469 291 5195
Grace Hellyer	Gemini ISV	grace@geminiisv.com	214.341.4829
Brent Goodson	Premier Services	[illegible]@premier.com	9725643896
ANTHONY SCHLEBACH	PREMIER SERVICES	ajschlebach@premierservicestx.com	972-564-3896
MARVIN STEELE	STEELMARC	marvin@steelmarc.com	9)864-1116
Brian Grannan	Infinity Sound	bidsales@infinity-sound.com	210-630-2198
KEITH HUBER	QUALITY SOUND	KRH@QUALITYSOUND.COM	817-247-3910

ADDENDUM No. 2

for

Crandall High School:
Performing Arts Center Addition

CRANDALL INDEPENDENT SCHOOL DISTRICT

September 3, 2024

The Bidder or proposer is responsible for obtaining all Addenda prior to submitting a bid or proposal to the district.

ADDENDUM NO. 01
TO THE
PROJECT MANUAL AND DRAWINGS
FOR

CLIENT NAME: **Crandall ISD**
PROJECT NAME: **Crandall HS: Performing Arts Center Addition**
DLR Group Project No. 39-23712-00

Prepared by:
DLR Group Inc. of Texas

The Drawings and Project Manual for the above named Project, dated J**uly 25, 2024**, are modified, amended, and supplemented as set forth in this Addendum and shall be taken into account in preparing Bids. This Addendum shall become part of the Contract Documents.

Wherein this Addendum is in conflict with the Specifications and Drawings, the requirements of this Addendum shall govern.

REVISIONS TO THE PROJECT MANUAL

The following Specification Sections are revised with this Addendum:

ITEM 1. Specification Section 03 30 00 CAST-IN-PLACE CONCRETE has been revised and re-issued in its entirety.

ITEM 2. Specification Section 08 71 00 DOOR HARDWARE has been revised and re-issued in its entirety.

ITEM 3. Specification Section 11 61 23 DRAPERY AND TRACK has been revised and re-issued in its entirety.

ITEM 4. Specification Section 11 61 33 MOTORIZED RIGGING has been revised and re-issued in its entirety.

ITEM 5. Specification Section 11 61 36 COUNTERWEIGHT RIGGING has been revised and re-issued in its entirety.

ITEM 6. Specification Section 11 61 39 FIRE SAFETY CURTAIN has been revised and re-issued in its entirety.

ITEM 7. Specification Section 11 61 63 ORCHESTRA SHELL has been revised and re-issued in its entirety.

REVISIONS TO DRAWINGS

The following Drawings are revised and reissued with this Addendum:

ITEM 8. G0.1 – COVER SHEET – has been revised to include new sheets added to the set as indicated on the re-issued sheet.

ITEM 9. CP1.3 – AUDIENCE CHAMBER CATCHMENT ZONES – has been revised to include the correct seat numbers on the catchment legend as indicated on the re-issued sheet.

ITEM 10. A1.1A – LEVEL 01 – AREA A – FLOOR PLAN – Doors A103C and A109 have been revised as indicated on re-issued sheet.

ITEM 11. A1.4 – OVERALL ROOF PLAN - has been revised as follows and indicated on the re-issued sheet:

i. Tapered insulation has been updated to match changes to structural drawings.

ii. Roof hatch on stage house roof has been shown.

ITEM 12. A3.1A – LEVEL 01 – AREA A – REFLECTED CEILING PLAN – Revised track lighting in BOH Corridor as indicated on the re-issued sheet.

ITEM 13. A4.1 - EXTERIOR ELEVATIONS – Illuminated signage notes have been added as indicated on the re-issued sheet.

ITEM 14. A4.2 EXTERIOR ELEVATIONS – Illuminated signage notes and detail callouts have been added as indicated on the re-issued sheet.

ITEM 15. A8.3 – DOOR & FRAME TYPE & SCHEDULE – Sheet has been revised with updated door schedule as indicated on the re-issued sheet.

ITEM 16. A8.5 – WINDOW TYPES, SCHEDULES, & ELEVATIONS – has been revised as follows and indicated on the re-issued sheet:

i. Glazing type FRG has been added to Glazing Type Descriptions

ii. All glazing has been updated from Curtain Wall to Storefront systems

iii. Details 1A, 1B, 1C, 2A, and 2C have been revised to include glazing films.

iv. Exterior Storefront Schedule has been added.

v. Interior Window Schedule has been updated to include the correct frame type at windows A118 and A119.

ITEM 17. A9.1 – EXTERIOR DETAILS – Details 5A and 5B has been revised as indicated on the re-issued sheet.

ITEM 18. A9.2 – EXTERIOR DETAILS – Details 3A, 5B, 5C have been revised and Detail 5E has been added as indicated on the re-issued sheet.

ITEM 19. A9.5 – EXTERIOR DETAILS – Sheet has been issued and added to the set in its entirety.

ITEM 20. A10.1– INTERIOR ELEVATIONS – Sheet has been revised to update door A103C, a countertop rollup door to Concessions as indicated on the re-issued sheet.

ITEM 21. A10.5 – INTERIOR ELEVATIONS - Sheet has been revised to update door A103C, a countertop rollup door to Concessions as indicated on the re-issued sheet.

ITEM 22. S1.2A – LEVEL 02 MEZZANINE – AREA A – FRAMIN PLAN – has been revised to show curb and reinforcement as indicated on the re-issued sheet.

ITEM 23. S2.3A – LEVEL 03 CATWALK – AREA A – FRAMING PLAN – has been revised to slope the BOH roof and Mezzanine roof, move plumbing reinforcement, and show slab step symbol as indicated on the re-issued sheet.

ITEM 24. S2.3B – LEVEL 03 CATWALK – AREA B – FRAMING PLAN – has been revised to slope the BOH roof and move plumbing reinforcement as indicated on the re-issued sheet.

ITEM 25. S5.5 – STEEL SECTIONS – Details 2A and 2B have been revised to show curb and reinforcement as indicated on the re-issued sheet.

ITEM 26. S5.6 – STEEL SECTIONS – Details 2F and 5F has been revised to show plate size and dimensions as indicated on the re-issued sheet.

ITEM 27. P2.1A – LEVEL 01 – AREA A - PLUMBING PLAN – Adjusted roof drains over BOH Corridor as indicated on the re-issued sheet.

ITEM 28. P2.1B – LEVEL 01 – AREA B - PLUMBING PLAN – Adjusted roof drains over BOH Corridor as indicated on the re-issued sheet.

ITEM 29. P2.2MA – LEVEL 02 MEZZANINE – AREA A – PLUMBING PLAN – roof drains have been adjusted over Mezzanine and Lobby as indicated on the re-issued sheet.

ITEM 30. P2.3 – OVERALL ROOF PLUMBING PLAN – Roof drains have been adjusted as indicated on the re-issued sheet.

ITEM 31. P4.1 – WASTE & VENT RISER DIAGRAMS – Riser diagram has been updated as indicated on the re-issued sheet.

ITEM 32. P4.2 – DOMESTIC RISER DIAGRAMS – Riser diagram has been updated as indicated on the re-issued sheet.

ITEM 33. P4.3 – STORM RISER DIAGRAMS – Riser diagram has been updated as indicated on the re-issued sheet.

ITEM 34. M1.2MA – LEVEL 02 MEZZANINE – AREA A – HVAC PLAN – Shift ductwork to avoid clashing with new roof drainpipe locations as indicated on the re-issued sheet.

ITEM 35. M1.3A – LEVEL 03 – AREA A – ROOF MECHANICAL PLAN – Shift condensate piping for new roof drain locations and shift condensing units on lobby roof away from new roof drain locations as indicated on the re-issued sheet.

ITEM 36. ES1.1 – ELECTRICAL SITE PLAN – Updated photometrics and controls to align with fixture types and mounting details as indicated on the re-issued sheet.

ITEM 37. ES1.2 – SITE LIGHTING PHOTOMETRICS – Updated photometrics and controls to align with fixture types and mounting details as indicated on the re-issued sheet.

ITEM 38. EL1.1A – LEVEL 01 – AREA A – LIGHTING PLAN – Updated photometrics and controls to align with fixture types and mounting details; adjusted track lighting to accommodate for mechanical diffuser as indicated on the re-issued sheet.

ITEM 39. EL1.2A – LEVEL 02 MEZZANINE – AREA A – LIGHTING PLAN – Updated photometrics and controls to align with fixture types and mounting details as indicated on the re-issued sheet.

ITEM 40. E2.2A – LEVEL 02 MEZZANINE – AREA A – POWER PLAN – Circuit has been identified for exterior illuminated signage as indicated on the re-issued sheet.

ITEM 41. E2.5A – ROOF LEVEL – POWER PLAN – Circuit has been identified for exterior illuminated signage as indicated on the re-issued sheet.

ITEM 42. E6.2 – ELECTRICAL DETAILS – Inverter Schedule has been added to the re-issued sheet.

ITEM 43. E7.1 – LIGHTING SCHEDULES – Updated photometrics and controls to align with fixture types and mounting details as indicated on the re-issued sheet.

ITEM 44. E7.4 – ELECTRICAL SCHEDULES – Updated breaker quantities as indicated on the re-issued sheet.

ITEM 45. QT1.22 – LEVEL 1 – THEATRICAL DRAPERY PLAN AND SECTION – PERCUSSION ROOM – Labels have been added as indicated on the re-issued sheet.

ITEM 46. QT1.23 – LEVEL 2 – THEATRICAL AND ACOUSTIC DRAPERY PLAN – CATWALK – Drapery track has been shifted to coordinate with luminaires as indicated on re-issued sheet.

ITEM 47. QT3.21 – THEATRICAL DRAPERY, LONGITUDINAL SECTION – Drapery track has been shifted to coordinate with luminaires as indicated on re-issued sheet.

ITEM 48. QT5.21 – THEATRICAL & ACOUSTIC DRAPERY DETAILS – Sheet has been revised and re-issued in its entirety.

END OF ADDENDUM NO. 01

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SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies cast-in place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:
   1. Footings, grade beams, drilled piers.
   2. Slabs-on-void-forms
   3. Slabs-on-metal-deck
   4. Walls.

1.2 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with fly ash; subject to compliance with requirements.

B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.3 SUBMITTALS

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

B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures each with its own identification number when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

C. Indicate the minimum following information:
   1. Mix Identification Number.
   2. Mix-use type.
   3. Required 28-day compressive strength.
   4. Cement content.
   5. Coarse aggregate type and quantity.
   6. Fine aggregate type and quantity.
   7. Total aggregate gradation.
   8. Water quantity.
   9. Admixture types and quantity.
   10. Slump measurement.
   11. Air content.
   12. 28-day shrinkage rate.
   13. 28-day concrete strength test.
   14. Alkali Silicate Reactivity (ASR).
   15. Chloride-ion content.
   16. Amounts of mixing water to be withheld for later addition at Project site.

D. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

E. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer, licensed in the state which the project is located, detailing fabrication, assembly, and support of formwork.

F. Concrete Slab Plans:
   1. Indicate all construction, contraction, control and expansion joints, as well as proposed start and stop of concrete pour joints.
   2. Indicate all sloped slab areas at floor drains. Label depth of floor drain and shape/ extent of sloped area surrounding drain.
   3. Indicate all slab recess areas. Dimension extents in plan, and depth of recess.

G. Welding certificates.

H. Qualification Data: For manufacturer and testing agency.

I. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:
   1. Aggregates. Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.

J. Material Certificates: For each of the following, signed by manufacturers:
   1. Cementitious materials.
   2. Admixtures.
   3. Form materials and form-release agents.
   4. Steel reinforcement and accessories.
   5. Waterstops.
   6. Curing compounds.
   7. Bonding agents.
   8. Adhesives.
   9. Vapor retarders.
   10. Semi-rigid joint filler.
   11. Joint-filler strips.
   12. Repair materials.

K. Floor surface flatness and levelness measurements to determine compliance with specified tolerances.

L. Field quality-control test reports.

M. Minutes of preinstallation conference.

1.4 QUALITY ASSURANCE

A. Installer of concrete topping slabs indicated to receive polished concrete finish and structural cast-in-place concrete slab shall be the same as installer for polished concrete finishes.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
   1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated, as documented according to ASTM E 548.
   1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-01 or an equivalent certification program.
   2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.

D. Moisture Vapor Reduction Admixture Testing Agent Qualifications:
   1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

E. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.

F. Welding: Qualify procedures and personnel according to AWS D1.4, "Structural Welding Code--Reinforcing Steel."

G. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
   1. ACI 301, "Specification for Structural Concrete," Sections 1 through 5."
   2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

H. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

I. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Sections.
   1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
      a. Contractor's superintendent.
      b. Independent testing agency responsible for concrete design mixtures.
      c. Ready-mix concrete manufacturer.

d. Concrete subcontractor.
e. Architect.

2. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, semirigid joint fillers, forms and form removal limitations, shoring and reshoring procedures, anchor rod and anchorage device installation tolerances, steel reinforcement installation, concrete repair procedures, and concrete protection.

J. Protection: No satisfactory chemical or cleaning procedure is available to remove petroleum stains from the concrete surface. Prevention is therefore essential. Protect areas to receive a sealed concrete finish during construction to prevent oils, dirt, metal, excessive water and other damaging materials from affecting the finished concrete surface. Protection measures listed below shall begin immediately after the concrete slab is poured:

1. Hydraulic powered equipment shall be diapered to avoid staining of the concrete.
2. Vehicle parking shall be prohibited on the finish slab area. If necessary to complete their scope of work, drop cloths shall be placed under vehicles at all times.
3. No pipe cutting machine shall be used on the finish floor slab.
4. Steel shall not be placed on the finish slab to avoid rusting.
5. Acids and acidic detergents will not come in contact with slab.
6. All equipment used on the finish slab shall be equipped with non-marking tires.
7. Painters shall use drop cloths on the concrete. Remove paint stains immediately.
8. Construction trades shall be informed that the slab must be protected at all times.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

1.6 WARRANTY

A. Moisture Vapor Reduction Admixture (MVRA):

1. MVRA must be installed according to, and in compliance with, the manufacturer's published data sheet to include, but not limited to:
   a. Dosing instructions.
   b. Onsite representation requirements.
   c. Use of an ASTM E 1745 vapor retarder installed following ASTM E 1643 and ASTM F710 guidelines.
2. Manufacturer's Warranty: To include:
   a. Term: Life of the concrete.
   b. Repair and/or removal of failed flooring or roofing.
   c. Placement of a topical moisture remediation system.
   d. Replacement of flooring/roofing materials like original installed to include material and labor.
3. Adhesion Warranty: MVRA Manufacturer shall provide an adhesion warranty to match the term of the adhesive and/or primer manufacturer's material defect warranty upon MVRA manufacturer's acceptance of field bond test.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

2.2 CONCRETE, GENERAL

A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301.
2. ACI 117.

2.3 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
   1. Plywood, metal, or other approved panel materials.
   2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
      a. Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.

B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

C. Forms for Pedestals and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that will produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation. Provide fiber tubes that produce surfaces without spiral or vertical seams.

D. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch (19 by 19 mm), minimum.

E. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.

F. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
   1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

G. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
   1. Furnish units that will leave no corrodible metal closer than 1 inch (25 mm) to the plane of exposed concrete surface.
   2. Furnish ties that, when removed, will leave holes no larger than 1 inch (25 mm) in diameter in concrete surface.
   3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

H. Nails and Fasteners:
   1. Use only galvanized nails and fasteners for securing formwork.

2.4 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

B. Low-Alloy-Steel Reinforcing Bars: ASTM A 706/A 706M, deformed.

C. Plain-Steel Wire: ASTM A 82, as drawn.

D. Plain-Steel Welded Wire Reinforcement: ASTM A 185, plain, fabricated from as-drawn steel wire into flat sheets.

2.5 REINFORCEMENT ACCESSORIES

A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), plain-steel bars, cut bars true to length with ends square and free of burrs.

B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete.
   1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2.6 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
   1. Portland Cement: ASTM C 150, Type I/II, gray. Supplement with the following for concrete other than slabs and flatwork:
      a. Fly Ash: ASTM C 618, Class C.

B. Normal-Weight Aggregates: ASTM C 33, Class 4S coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials. Coarse aggregate shall be from a source and ledge approved by Missouri Department of Transportation.
   1. Maximum Coarse-Aggregate Size: As indicated.

2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Water: ASTM C 94/C 94M and potable.

2.7 ADMIXTURES

A. Air-Entraining Admixture: ASTM C 260.

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

C. Moisture Vapor Reduction Admixture: For use in all interior slabs on ground.
1. Basis-of-Design Product: Subject to compliance with requirements, provide Barrier One Incorporated; High Performance Concrete Admixture or comparable product by one of the following:
a. Concure Systems; High Performance Concrete Admixture.
b. ISE Logik Industries; MVRA 900 Admixture.
c. Moxie; Shield 1800 Admixture.
d. The Specialty Products Group; Vapor Lock 20/20.
e. Failure to provide a product that meets or exceeds the MVRA warranty requirements of Part 1 and the MVRA field quality control requirements of Part 3 will result in all subsequent testing and slab remediation costs being born by the ready mix supplier.
2. Description: Concrete moisture vapor reduction admixture for all interior slabs on ground shall be a non-toxic liquid admixture specifically designed to have a natural chemical reaction with pre-existing elements inside the concrete to eliminate the route of moisture vapor emission through the slab by restricting the integral capillary system. Chemical reaction shall form a permanent barrier (capillary break) that is integral to the concrete, insoluble, and irremovable.

2.8 WATERSTOPS

A. Self-Expanding Butyl Strip Waterstops: Manufactured rectangular or trapezoidal strip, butyl rubber with sodium bentonite or other hydrophilic polymers, for adhesive bonding to concrete, 3/4 by 1 inch (19 by 25 mm).
1. Products: Subject to compliance with requirements, provide one of the following:
a. Colloid Environmental Technologies Company; Volclay Waterstop-RX.
b. Concrete Sealants Inc.; Conseal CS-231.
c. Greenstreak; Swellstop.
d. Henry Company, Sealants Division; Hydro-Flex.
e. JP Specialties, Inc.; Earthshield Type 20.
f. Progress Unlimited, Inc.; Superstop.
g. TCMiraDRI; Mirastop.

2.9 VAPOR RETARDERS

A. Plastic Vapor Retarder: ASTM E 1745, Class A. Include manufacturer's recommended adhesive or pressure-sensitive tape.
1. Products: Subject to compliance with requirements, provide one of the following:
a. Fortifiber Corporation; Moistop Ultra, 15 mils.
b. Raven Industries Inc.; Vapor Block, 15 mils.
c. Stego Industries, LLC; Stego Wrap, 15 mils.
d. Insulation Solutions, Inc.: Viper Vaporcheck, 16 mils.

B. Granular Fill: Clean mixture of crushed stone or crushed or uncrushed gravel; ASTM D 448, Size 57, with 100 percent passing a 1-1/2-inch (37.5-mm) sieve and 0 to 5 percent passing a No. 8 (2.36-mm) sieve placed below the vapor retarder.
1. Install and compact at 4 inches minimum depth, unless otherwise indicated on the Drawings.

2.10 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Axim Concrete Technologies; Cimfilm.
   b. Burke by Edoco; BurkeFilm.
   c. ChemMasters; Spray-Film.
   d. Conspec Marketing & Manufacturing Co., Inc., a Dayton Superior Company; Aquafilm.
   e. Dayton Superior Corporation; Sure Film.
   f. Euclid Chemical Company (The); Eucobar.
   g. Kaufman Products, Inc.; Vapor Aid.
   h. Lambert Corporation; Lambco Skin.
   i. L&M Construction Chemicals, Inc.; E-Con.
   j. MBT Protection and Repair, Div. of ChemRex; Confilm.
   k. Meadows, W. R., Inc.; Sealtight Evapre.
   l. Metalcrete Industries; Waterhold.
   m. Nox-Crete Products Group, Kinsman Corporation; Monofilm.
   n. Sika Corporation, Inc.; SikaFilm.
   o. Spec Chem; Spec Film RTU.
   p. Symons Corporation, a Dayton Superior Company; Finishing Aid.
   q. Unitex; Pro-Film.
   r. US Mix Products Company; US Spec Monofilm ER.
   s. Vexcon Chemicals, Inc.; Certi-Vex EnvioAssist.

B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

C. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.
1. Products: Subject to compliance with requirements, provide one of the following:
   a. Anti-Hydro International, Inc.; AH Curing Compound #2 DR WB.
   b. Burke by Edoco; Aqua Resin Cure.
   c. ChemMasters; Safe-Cure Clear.
   d. Conspec Marketing & Manufacturing Co., Inc., a Dayton Superior Company; W.B. Resin Cure.
   e. Dayton Superior Corporation; Day Chem Rez Cure (J-11-W).
   f. Euclid Chemical Company (The); Kurez DR VOX.
   g. Kaufman Products, Inc.; Thinfilm 420.
   h. Lambert Corporation; Aqua Kure-Clear.
   i. L&M Construction Chemicals, Inc.; L&M Cure R.
   j. Meadows, W. R., Inc.; 1100 Clear.
   k. Nox-Crete Products Group, Kinsman Corporation; Resin Cure E.
   l. Spec Chem; Spec REZ.
   m. Symons Corporation, a Dayton Superior Company; Resi-Chem Clear Cure.
   n. Tamms Industries, Inc.; Horncure WB 30.
   o. Unitex; Hydro Cure 309.
   p. US Mix Products Company; US Spec Maxcure Resin Clear.
   q. Vexcon Chemicals, Inc.; Certi-Vex Enviocure 100.
   ~~q.~~ r. FTS Design Build Concrete; VaporSeal309.

2.11 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1752, cork or self-expanding cork.

B. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

C. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

D. Reglets: Fabricate reglets of not less than 0.0217-inch- (0.55-mm-) thick, galvanized steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.

2.12 REPAIR MATERIALS

A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch (3.2 mm) and that can be feathered at edges to match adjacent floor elevations.
1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.

3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by underlayment manufacturer.
4. Compressive Strength: Not less than 4100 psi (29 MPa) at 28 days when tested according to ASTM C 109/C 109M.

B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch (3.2 mm) and that can be feathered at edges to match adjacent floor elevations.
1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 5000 psi (34.5 MPa) at 28 days when tested according to ASTM C 109/C 109M.

C. Repair Mortar for precast concrete panel joints: Dayton-Superior “Waterstop” hydraulic cement repair mortar, or equal’

2.13 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

B. Cementitious Materials: Provide percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
1. Fly Ash: 15 percent for foundations and walls.

C. Limit water-soluble, chloride-ion content in hardened concrete to 0.3 percent by weight of cement.

D. Admixtures: Use admixtures according to manufacturer's written instructions.
1. Use water-reducing, high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.

2.14 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Proportion normal-weight concrete mixtures to equal or exceed the minimum 28 day concrete compressive strength and other specified criteria indicated on the drawings.

B. Slabs-on-grade: Comply with Paragraph 2.16.A and as follows:
1. Moisture Vapor Reduction Admixture: Dose at 14 ounces per 100 pounds of total cementitious materials. Remove an equal amount of water from the mix. Add separately from other admixtures at the tail end of the load.

2.15 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.16 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and furnish batch ticket information.
1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:
1. Class A, 1/8 inch (3.2 mm) for smooth-formed finished surfaces.
2. Class B, 1/4 inch (6 mm) for rough-formed finished surfaces.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
1. Install keyways, reglets, recesses, and the like, for easy removal.
2. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

H. Chamfer exterior corners and edges of permanently exposed concrete.

I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."
2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

3.3 REMOVING AND REUSING FORMS

A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete, if concrete is hard enough to not be damaged by form-removal operations and curing and protection operations are maintained.
1. Leave formwork for structural elements that supports weight of concrete in place until concrete has achieved at least 75 percent of its 28-day design compressive strength.
2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.4 VOID FORMS

A. Product of a reputable manufacturer regularly engaged in commercial production of void forms for the purpose of providing void space below foundation elements as protection from subgrade movement.

1. Void forms shall be capable of supporting required dead load of wet concrete plus normal construction loads until applied loads can be supported by concrete structure, while maintaining full void depth as indicated on drawings.
2. Void forms shall be manufactured with corrugated material with a moisture resistant exterior, an interior fabrication of a uniform, cellular configuration composed of non-wax impregnated components, and shall be biodegradable.
3. Depth: As indicated on drawings.
4. Profile: As indicated on drawings.
   a. select one of following cross-sections based on geotechnical recommendations. generally, rectangular profile should be specified along with void retainers, unless geotechnical engineer specifically states allowance for trapezoidal void forms in geotech report.
   b. Rectangular in cross-section. (Trapezoidal sections are not permitted)
5. select/edit required strength of carton forms. use 6 to 8 times concrete weight for slabs. use 1.5 to 2 times concrete weight for grade beams and walls. carton form strengths available are 500 to 5000 psf. intent should be to not over-specify strength as carton forms must decay. stronger units require more time to decay.
6. Strength: Capable of supporting a working load as indicated below, in dry condition, (as evidence by Independent Testing Laboratory Tests).
   a. 3,000 psf.

B. Void Retainer Units: Precast concrete units with 28-day compressive strength (f'c) not less than 2,500 psi, reinforced with 6x6-W1.4xW1.4 W.W.F., with following minimum dimensions for individual units, unless otherwise noted on drawings. Thickness = 1-5/8 in (40 mm); Length = 3 ft (.9 m); Unless otherwise indicated on Drawings or specified, height not less than carton/void height plus 6 in (150 mm). Do not substitute trapezoidal carton forms for carton forms specified to receive void retainer units.
   1. Acceptable option to above precast concrete units for void retention: "SureRetainer" as manufactured by SureVoid Products, Inc. Depth and installation as recommended by manufacturer to ensure soil retention for specified carton form depth. Submit size and installation instructions for approval prior to use.

3.5 VAPOR RETARDERS

A. Plastic Vapor Retarders: Place, protect, and repair vapor retarders according to ASTM E 1643 and manufacturer's written instructions.
   1. Lap joints 6 inches (150 mm) and seal with manufacturer's recommended tape.
   2. Seal around all penetrations with manufacturer's recommended tape.

3.6 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
   1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
   1. Weld reinforcing bars according to AWS D1.4, where indicated.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset

F. laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.7 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
   1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.

2. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
3. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
4. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
5. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
6. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one- fourth of concrete thickness as follows:
1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch (3.2 mm). Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3.2-mm-) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
2. Terminate full-width joint-filler strips not less than 1/2 inch (13 mm) or more than 1 inch (25 mm) below finished concrete surface where joint sealants, specified in Section 07 92 00 "Joint Sealants," are indicated.
3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.8 WATERSTOPS

A. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

3.9 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.

C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301 and if specifically approved by the Architect.
1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches (150 mm) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
   1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
   2. Maintain reinforcement in position on chairs during concrete placement.
   3. Screed slab surfaces with a straightedge and strike off to correct elevations.
   4. Slope surfaces uniformly to drains where required.
   5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
   1. When average high and low temperature is expected to fall below 40 deg F (4.4 deg C) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
   2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
   3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

G. Hot-Weather Placement: Comply with ACI 301 and as follows:
   1. Maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
   2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.10 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
   1. Apply to concrete surfaces not exposed to public view such as mechanical rooms and storage rooms where cast-in-place concrete walls occur.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes, defects and voids larger than 3/4 inch wide or ½ inch deep. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
   1. Apply to concrete surfaces exposed to public view.

C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.11 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull- floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch (6 mm) in 1 direction.
   1. Apply scratch finish to surfaces to receive concrete floor toppings.

C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.
   1. Apply float finish to surfaces to receive trowel finish.

D. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
   1. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film- finish coating system.

2. Finish surfaces to the following tolerances, according to ASTM E 1155 (ASTM E 1155M), for a randomly trafficked floor surface:
   a. Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17; for slabs-on- grade with carpet, ceramic tile, sheet flooring, vinyl tile and other thin flooring materials, and at areas with no floor covering.
   b. Specified overall values of flatness, F(F) 50; and of levelness, F(L) 40; with minimum local values of flatness, F(F) 40; and of levelness, F(L) 35; for gymnasiums.

E. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces indicated where ceramic or quarry tile is to be installed by either thickset or thin-set method. While concrete is still plastic, slightly scarify surface with a fine broom

F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.
1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

3.12 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in- place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.
1. Construct concrete bases 4 inches ((100 mm)) high unless otherwise indicated; and extend base not less than 6 inches (150 mm) in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated or unless required for seismic anchor support.

D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on Drawings. Screed, tamp, and trowel-finish concrete surfaces.

3.13 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
1. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
   a. Cure concrete surfaces to receive floor coverings with a moisture-retaining cover.
2. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
   a. After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project.

3.14 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

B. Defer joint filling until concrete has aged at least one month. Do not fill joints until construction traffic has permanently ceased.

C. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

D. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches (50 mm) deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

E. Apply concrete repair mortar to base of precast panels per detail and manufacturer recommendations.

3.15 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 (1.18-mm) sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
   1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch (13 mm) in any dimension in solid concrete, but not less than 1 inch (25 mm) in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
   2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
   3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
   1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch (0.25 mm) wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
   2. After concrete has cured at least 14 days, correct high areas by grinding.
   3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
   4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
   5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch (6 mm) to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
   6. Repair defective areas, except random cracks and single holes 1 inch (25 mm) or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch (19-mm) clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
   7. Repair random cracks and single holes 1 inch (25 mm) or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.16 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner shall engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Inspections:
1. Steel reinforcement placement.
2. Steel reinforcement welding.
3. Headed bolts and studs.
4. Verification of use of required design mixture.
5. Concrete placement, including conveying and depositing.
6. Curing procedures and maintenance of curing temperature.
7. Verification of concrete strength before removal of shores and forms from beams and slabs.

C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd. (4 cu. m), but less than 25 cu. yd. (19 cu. m), plus one set for each additional 50 cu. yd. (38 cu. m) or fraction thereof.
   a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
   b. Either 6-inch diameter by 12-inch cylinders or 4-inch diameter by 8-inch cylinders are acceptable.
   c. Cylinder diameter shall be at least three times the nominal maximum coarse aggregate size if the mix being tested.
   d. All cylinders of a class of concrete shall be the same size.
2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C 231, pressure method at point of placement, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each composite sample.
5. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
6. Compression Test Specimens: ASTM C 31/C 31M.
   a. A set of test cylinders shall consist of a minimum of four standard cylinder specimens for each composite sample. The number per set may be greater depending on the cylinder sizes.
7. Compressive-Strength Tests: ASTM C 39/C 39M; test one cylinder of the laboratory- cured specimens at 7 days and one set of at least two cylinders at 28 days.
   a. Test one cylinder of a set at 7 days and one set of two 6” by 12” cylinders or three 4” by 8” cylinders at 28 days.
   b. One cylinder shall be retained in reserve to be tested as directed by the Engineer.
   c. A compressive-strength test shall be the average compressive strength from a set of at least two cylinders obtained from the same composite sample and tested at age indicated.
8. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa). Maintenance of test data records required for evaluation and acceptance of concrete strengths per ACI 318 shall be by the Contractor.
9. When the aforementioned acceptance criteria are not met the Contractor shall evaluate operations and steps shall be taken to increase the average of subsequent strength test results.
10. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

11. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
12. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
13. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
14. Correct deficiencies in the Work that test reports and inspections indicate does not comply with the Contract Documents.

D. Testing of Slabs Containing MVRA:
1. The moisture vapor reduction admixture (MVRA) manufacturer will perform all moisture testing in accordance with this specification and will issue project specific warranties prior to installation of any slab finishes; no further field slab moisture nor pH testing shall be required.
    a. Failure to provide a product that meets or exceeds these requirements will result in all subsequent testing and slab remediation costs being borne by the contractor.
2. A representative or agent of the moisture vapor reduction admixture (MVRA) manufacturer must be present at the jobsite during placement of all MVRA treated concrete. Do not proceed without this representative being present.
3. Field testing technician shall, at the expense of the MVRA Manufacturer, procure at least one 4 inch (102 mm) cylinder from every day of placement of MVRA dosed concrete for the purpose of subsequent hydraulic conductivity/coefficient of permeability testing.
4. All cylinders shall be independently lab tested in accordance with ASTM D 5084 at the expense of the MVRA manufacturer.
5. Test results must conform to specified limits.
    a. Should any cylinder from any day of placement deliver results in excess of 6.0 E- 08 cm/sec, the concrete moisture vapor reduction admixture manufacturer shall procure, at their expense, a core (or cores) from that day of placement. This core (cores) shall be sent to an independent laboratory for hydraulic conductivity (coefficient or permeability) per ASTM D 5084.
    b. Should any core deliver results in excess of 6.0 E-08 cm/sec per ASTM D 5084, the concrete moisture vapor reduction admixture manufacturer shall provide, at their expense, a topical moisture mitigation system for all areas not meeting the stated limit.
6. Proceeding with placement of concrete dosed with the MVRA without the required representation will result in the contractor bearing the cost to core and ship appropriate material for testing per ASTM D 5084.

END OF SECTION 03 30 00

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes commercial door hardware for the following:

1. Swinging doors.
2. Other doors to the extent indicated.

B. Door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Electromechanical door hardware.
3. Cylinders specified for doors in other sections.

C. Related Sections:

1. Division 08 Section “Hollow Metal Doors and Frames”.
2. Division 08 Section “Flush Wood Doors”.
3. Division 08 Section “Sound Control Hollow Metal Door Assemblies”.
4. Division 08 Section “Sound Control Wood Door Assemblies”.
5. Division 08 Section “Aluminum-Framed Entrances and Storefronts”.

D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ICC/IBC - International Building Code.
3. NFPA 70 - National Electrical Code.
4. NFPA 80 - Fire Doors and Windows.
5. NFPA 101 - Life Safety Code.
6. NFPA 105 - Installation of Smoke Door Assemblies.
7. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:

1. ANSI/BHMA Certified Product Standards - A156 Series.
2. UL10C - Positive Pressure Fire Tests of Door Assemblies.
3. ANSI/UL 294 - Access Control System Units.
4. UL 305 - Panic Hardware.

5. ANSI/UL 437- Key Locks.

1.3 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing, fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
3. Content: Include the following information:

    a. Type, style, function, size, label, hand, and finish of each door hardware item.
    b. Manufacturer of each item.
    c. Fastenings and other pertinent information.
    d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
    e. Explanation of abbreviations, symbols, and codes contained in schedule.
    f. Mounting locations for door hardware.
    g. Door and frame sizes and materials.
    h. Warranty information for each product.

4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Shop Drawings: Details of electrified access control hardware indicating the following:

1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:

    a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
    b. Complete (risers, point-to-point) access control system block wiring diagrams.
    c. Wiring instructions for each electronic component scheduled herein.

2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.

D. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

E. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

1.4 CLOSEOUT SUBMITTALS

A. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

1. Maintenance manual must be provided for tornado/hurricane storm shelter impact protective systems.

B. Project Record Documents: Provide record documentation of as-built door hardware sets in digital format (.pdf, .docx, .xlsx, .csv) and as required in Division 01, Project Record Documents.

C. Project Record Documents: Provide record documentation of as-built door hardware sets in digital format (.pdf, .docx, .xlsx, .csv) or acceptable integrated file format for updating of Openings Studio™ management software and as required in Division 01, Project Record Documents.

1.5 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

B. Certified Products: Where specified, products must maintain a current listing in the Builders Hardware Manufacturers Association (BHMA) Certified Products Directory (CPD).

C. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

D. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult

with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

E. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.

1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.

F. Each unit to bear third party permanent label indicating compliance with the referenced testing standards.

G. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:

1. Function of building, purpose of each area and degree of security required.
2. Plans for existing and future key system expansion.
3. Requirements for key control storage and software.
4. Installation of permanent keys, cylinder cores and software.
5. Address and requirements for delivery of keys.

H. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.

1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
3. Review sequence of operation narratives for each unique access controlled opening.
4. Review and finalize construction schedule and verify availability of materials.
5. Review the required inspecting, testing, commissioning, and demonstration procedures

I. At completion of installation, provide written documentation that components were applied according to manufacturer's instructions and recommendations and according to approved schedule.

1.6 DELIVERY, STORAGE AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.7 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.8 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of the hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
4. Electrical component defects and failures within the systems operation.

C. Warranty Period: Unless otherwise indicated, warranty shall be one year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:

1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 BUTT HINGES

A. Hinges: ANSI/BHMA A156.1 butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.

1. Quantity: Provide the following hinge quantity:

   a. Two Hinges: For doors with heights up to 60 inches.
   b. Three Hinges: For doors with heights 61 to 90 inches.
   c. Four Hinges: For doors with heights 91 to 120 inches.
   d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.

2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

   a. Widths up to 3’0”: 4-1/2” standard or heavy weight as specified.
   b. Sizes from 3’1” to 4’0”: 5” standard or heavy weight as specified.

3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:

   a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
   b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.

4. Hinge Options: Comply with the following:

   a. Non-removable Pins: With the exception of electric through wire hinges, provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.
   b. Cam Lift Hinges: Where specified provide hinges that move the door up and then lower it to create a tight seal when the door is closed.

5. Manufacturers:

   a. McKinney (MK) - TA/T4A Series, 5-knuckle.

2.3 CONTINUOUS HINGES

A. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 continuous geared hinge. with minimum 0.120-inch thick extruded 6063-T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cut-outs.

1. Manufacturers:.

    a. Pemko (PE).

2.4 POWER TRANSFER DEVICES

A. Concealed Quick Connect Electric Power Transfers: Provide concealed wiring pathway housing mortised into the door and frame for low voltage electrified door hardware. Furnish with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

1. Manufacturers:

    a. Pemko (PE) - EL-CEPT Series.
    b. Securitron (SU) - EL-CEPT Series.

B. Electric Door Wire Harnesses: Provide electric/data transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number and type of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.

1. Provide one each of the following tools as part of the base bid contract:

    a. McKinney (MK) - Electrical Connecting Kit: QC-R001.
    b. McKinney (MK) - Connector Hand Tool: QC-R003.

2. Manufacturers:

    a. McKinney (MK) - QC-C Series.

2.5 DOOR OPERATING TRIM

A. Flush Bolts and Surface Bolts: Provide products conforming to ANSI/BHMA A156.3 and A156.16, Grade 1.

1. Flush bolts to be furnished with top rod of sufficient length to allow bolt retraction device location approximately six feet from the floor.
2. Furnish dust proof strikes for bottom bolts.
3. Surface bolts to be minimum 8” in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable.
4. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.
5. Manufacturers:

    a. Rockwood (RO).

B. Coordinators: ANSI/BHMA A156.3 door coordinators consisting of active-leaf, hold-open lever and inactive-leaf release trigger. Model as indicated in hardware sets.

1. Manufacturers:

a. Rockwood (RO).

C. Door Push Plates and Pulls: ANSI/BHMA A156.6 door pushes and pull units of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.

1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
4. Pulls, where applicable, shall be provided with a 10” clearance from the finished floor on the push side to accommodate wheelchair accessibility.
5. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets. When through-bolt fasteners are in the same location as a push plate, countersink the fasteners flush with the door face allowing the push plate to sit flat against the door.
6. Manufacturers:

a. Rockwood (RO).

2.6 CYLINDERS AND KEYING

A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

B. Cylinder Types: Original manufacturer cylinders able to supply the following cylinder formats and types:

1. Threaded mortise cylinders with rings and cams to suit hardware application.
2. Rim cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
3. Bored or cylindrical lock cylinders with tailpieces as required to suit locks.
4. Tubular deadlocks and other auxiliary locks.
5. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
6. Keyway: Manufacturer’s Standard.

C. Large Format Interchangeable Cores: Provide removable cores (LFIC) as specified, core insert, removable by use of a special key, and for use with only the core manufacturer's cylinder and door hardware.

D. Patented Cylinders: ANSI/BHMA A156.5, Grade 1 Certified Products Directory (CPD) listed cylinders employing a utility patented and restricted keyway requiring the use of a patented key. Cylinders are to be protected from unauthorized manufacture and distribution by manufacturer’s United States patents.

1. Patented key systems shall not be established with products that have an expired patent. Expired systems shall only be specified and supplied to support existing systems.
2. Manufacturers:

    a. Corbin Russwin (RU) - Pyramid.
    b. No Substitution.

E. Keying System: Each type of lock and cylinders to be factory keyed.

1. Supplier shall conduct a "Keying Conference" to define and document keying system instructions and requirements.
2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
3. Existing System: Field verify and key cylinders to match Owner's existing system.

F. Key Quantity: Provide the following minimum number of keys:

1. Change Keys per Cylinder: Two (2)
2. Master Keys (per Master Key Level/Group): Five (5).
3. Construction Keys (where required): Ten (10).

G. Construction Keying: Provide construction master keyed cylinders.

H. Key Registration List (Bitting List):

1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
2. Provide transcript list in writing or electronic file as directed by the Owner.

2.7 KEY CONTROL

A. Key Control Cabinet: Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall have expansion capacity of 150% of the number of locks required for the project.

1. Manufacturers:

    a. Lund Equipment (LU).
    b. MMF Industries (MM).
    c. Telkee (TK).

P. Electronic Key Management System: Provide an electronic key control system with Stand-alone Plug and Play features including advanced RFID technology. Touchscreen interface with PIN access for keys individually locked in place. Minimum 1,000 system users and 21 iFobs for locking receptors. System shall have a minimum 250,000 audit events screen displayed or ability to be exported via USB port.

1. Manufacturers:

    a. Medeco (MC).

2.8 MORTISE LOCKS AND LATCHING DEVICES

A. Mortise Locksets, Grade 1 (Heavy Duty): Provide ANSI/BHMA A156.13, Series 1000, Operational Grade 1 Certified Products Directory (CPD) listed mortise locksets. Listed manufacturers shall meet all functions and features as specified herein.

1. Manufacturers:

a. Corbin Russwin Hardware (RU) - ML2000 Series.
b. No Substitution.

2.9 LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

B. Standards: Comply with the following:

1. Strikes for Mortise Locks and Latches: BHMA A156.13.
2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

2.10 CONVENTIONAL EXIT DEVICES

A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:

1. Exit devices shall have a five-year warranty.
2. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.
3. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer’s catalog and template book for specific requirements.
4. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.
5. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.

6. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.

    a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
    b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.

7. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.
8. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2” wide stiles.
9. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
10. Rail Sizing: Provide exit device rails factory sized for proper door width application.
11. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.

B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed exit devices. Listed manufacturers shall meet all functions and features as specified herein.

1. Electromechanical exit devices shall have the following functions and features:

    a. Universal Molex plug-in connectors that have standardized color-coded wiring and are field configurable in fail safe or fail secure and operate from 12vdc to 24vdc regulated.
    b. Wire routing for all non-access control electromechanical functions and EcoFlex trim to be contained within the carrier of the device eliminating the need for cavities in doors to be drilled. Include a protective film so that wires don't get damaged if the rail needs to be removed.
    c. EcoFlex or equivalent technology that reduces energy consumption up to 92% as certified by GreenCircle.
    d. Options to be available for request-to-exit or enter signaling, latchbolt and touchbar monitoring.
    e. Field configurable electrified trim to fail-safe or fail-secure that operates from 12-24VDC.

2. Manufacturers:

    a. Corbin Russwin Hardware (RU) - PED4000 / PED5000 Series.
    b. No Substitution.

C. Security Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed rim panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device latch to be constructed of high grade, heat treated, corrosion resistant nickel steel alloy, and have a full 3/4" throw projection with slide action positive deadlocking.

1. Static Load Force Resistance: Minimum 3000 lbs. certified independent tested.

2. Manufacturers:

    a. Corbin Russwin Hardware (RU) - ED4000S / ED5000S Series.

b. No Substitution.

D. Tubular Panic Devices: ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Device to be ADA compliant requiring less than 5 lbs. of force to activate. Post mounting with optional mechanical dogging. Provide proper fasteners as required by manufacturer to meet application requirements. Provide exit devices on both leaves of pairs of doors.

1. Style: Exposed vertical rod. 1-1/4” grip diameter with interior operating panic handle in combination with exterior fixed pull handle. Panic mechanism shall be concealed within brass or stainless steel tubing. Optional entrance from exterior by a keyed cylinder.
2. Configurations (provide as specified):
3. Push/pull operation when dogged from the inside.
4. Latching: Top latching. Reversed, flat, Pullman style. Roller-type latching not acceptable.
5. Engraved "PUSH" signage with optional paint infill and boundary grooves.
6. Manufacturers:

a. Rockwood (RO) - PDU8500 Series.
b. No Substitution.

2.11 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers.
2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
3. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the Americans with Disabilities Act, provide units complying with ANSI ICC/A117.1.
4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
5. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Large Body Cast Iron): ANSI/BHMA A156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control.

1. Large body cast iron surface mounted door closers shall have a 30-year warranty.
2. Manufacturers:

a. Corbin Russwin Hardware (RU) - DC8000 Series.
b. No Substitution.

2.12 SURFACE MOUNTED CLOSER HOLDERS

A. Electromagnetic Door Holders: ANSI A156.15 electromagnetic door holder/releases with a minimum 20 to 40 pounds holding power and single coil construction able to accommodate.12VDC, 24VAC, 24VDC and 120VAC. Coils to be independently wound, employing an integral fuse and armatures to include a positive release button.

1. Manufacturers:

a. Norton Rixson (RF) - 980/990 Series.
b. No Substitution.

2.13 ARCHITECTURAL TRIM

A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1” LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
3. Where plates are applied to fire rated doors with the top of the plate more than 16” above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer’s catalog and template book for specific requirements for size and applications.
4. Protection Plates: ANSI/BHMA A156.6 protection plates (kick, armor, or mop), fabricated from the following:

a. Stainless Steel: 300 grade, 050-inch thick.

5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.
6. Manufacturers:

a. Rockwood (RO).

2.14 DOOR STOPS AND HOLDERS

A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.

B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

1. Manufacturers:

a. Rockwood (RO).

2.15 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.

C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.

1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NFPA 252, Standard Methods of Fire Tests of Door Assemblies.

D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

F. Manufacturers:

1. Pemko (PE).

2.16 ELECTRONIC ACCESSORIES

A. Door Position Switches: Door position magnetic reed contact switches specifically designed for use in commercial door applications. On recessed models the contact and magnetic housing snap-lock into a 1" diameter hole. Surface mounted models include wide gap distance design complete with armored flex cabling. Provide SPDT, N/O switches with optional Rare Earth Magnet installation on steel doors with flush top channels.

1. Manufacturers:

a. Securitron (SU) - DPS Series.

B. Switching Power Supplies: Provide power supplies with either single or dual voltage configurations at 12 or 24VDC. Power supplies shall have battery backup function with an integrated battery charging circuit and shall provide capability for power distribution, direct lock control and Fire Alarm Interface (FAI) through add on modules. Power supplies shall be expandable up to 16 individually protected outputs. Output modules shall provide individually protected, continuous outputs and/or individually protected, relay controlled outputs.

1. Manufacturers:

a. Securitron (SU) - AQD Series.

2.17 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.18 FINISHES

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.

1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.

B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
2. DHI TDH-007-20: Installation Guide for Doors and Hardware.
3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

D. Push Plates and Door Pulls: When through-bolt fasteners are in the same location as a push plate, countersink the fasteners flush with the door face allowing the push plate to sit flat against the door.

E. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

F. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

A. Field Inspection (Punch Report): Reference Division 01 Sections “Closeout Procedures”. Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.

1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.

C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

1. Quantities listed are for each pair of doors, or for each single door.
2. The supplier is responsible for handing and sizing all products.
3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.
4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.

B. Manufacturer’s Abbreviations:

1. MK - McKinney
2. PE - Pemko
3. SU - Securitron
4. RO - Rockwood
5. RU - Corbin Russwin
6. NO - Norton
7. RF - Rixson
8. OT - Other

Hardware Sets

Set: 1.0

Doors: A101B
Description: EXTERIOR STOREFRONT PAIR CARD READER TUBULAR PANIC (BLACK FINISH)

2 Continuous Hinge	BSPFM95SLF-HD1		PE	087100
2 Storefront Panic Device	PDU8500-3 04	BSP	RO	087100
2 Mortise Cylinder/Core	Match Existing Pyramid LFIC Key	Match	RU	087100

	System				
1 Electric Strike Kit	ESK-1600-DBL LM	BSP	RO	087100	
2 Surface Closer w/ Hvy Dty Stop	DC8210 A11	BSP	RU	087100	
1 Perimeter Seals	By Door & Frame Manufacturer		OT		
1 Rain Guard	346BSP + 4" ODW		PE	087100	
2 Sweep	345BSPNB		PE	087100	
1 Threshold	252x3BSPFG		PE	087100	
1 ElectroLynx Harness	QC-C2500P		MK	087100	
2 Position Switch	DPS-X-BK		SU	087100	
1 Detector	SREX-100		AK	087100	
1 Power Supply	AQD x Amps Required		SU	087100	
1 Card Reader	By Security Contractor		OT		

Set: 2.0

Doors: A196
Description: EXTERIOR STOREFRONT PAIR EXIT ONLY TUBULAR PANIC (BLACK FINISH)

2 Continuous Hinge	BSPFM95SLF-HD1		PE	087100
2 Storefront Panic Device, Exit Only	PDU8500	BSP	RO	087100
2 Surface Closer w/ Hvy Dty Stop	DC8210 A11	BSP	RU	087100
1 Perimeter Seals	By Door & Frame Manufacturer		OT	
1 Rain Guard	346BSP + 4" ODW		PE	087100
2 Sweep	345BSPNB		PE	087100
1 Threshold	252x3BSPFG		PE	087100

Set: 3.0

Doors: A101A
Description: EXTERIOR STOREFRONT PAIR CARD READER (BLACK FINISH) AUTO OPERATOR

2 Continuous Hinge	BSPFM95SLF-HD1		PE	087100	
2 Storefront Panic Device	PDU8500-3 04	BSP	RO	087100	
2 Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100	
1 Electric Strike Kit	ESK-1600-DBL LM	BSP	RO	087100	
1 Surface Closer w/ Hvy Dty Stop	DC8210 A11	BSP	RU	087100	
1 Automatic Opener	6071 RF	BSP	NO	087100	
1 Perimeter Seals	By Door & Frame Manufacturer		OT		
1 Rain Guard	346BSP + 4" ODW		PE	087100	
2 Sweep	345BSPNB		PE	087100	
1 Threshold	252x3BSPFG		PE	087100	
1 ElectroLynx Harness	QC-C2500P		MK	087100	
2 Door Switch	504		NO	087100	

2	Position Switch	DPS-X-BK		SU	087100
1	Detector	SREX-100		AK	087100
1	Power Supply	AQD x Amps Required		SU	087100
1	Card Reader	By Security Contractor		OT	

Set: 4.0

Doors: A114B, A127A
Description: EXTERIOR HM PAIR CARD READER SVR (BLACK FINISH)

2	Continuous Hinge	BSPFM83HD1 SER12		PE	087100
1	Electrified SVR Exit, Fail Secure	ED5470 N9905ET M55 M92 M52	BSP	RU	087100
1	Surface Vert Rod Exit, Dummy	ED5470 N950ET M55 M92 M52	BSP	RU	087100
3	Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
2	Surface Closer w/ Hvy Dty Stop	DC8210 A11	BSP	RU	087100
2	Kick Plate	K1050 10" CSK BEV	BSP	RO	087100
1	Astragal	18041BSPNB		PE	087100
1	Rain Guard	346BSP + 4" ODW		PE	087100
1	Gasketing	2891BSPV		PE	087100
2	Sweep	345BSPNB		PE	087100
1	Threshold	252x3BSPFG		PE	087100
2	ElectroLynx Harness	QC-C2500P		MK	087100
2	ElectroLynx Harness	QC-C300P		MK	087100
2	Position Switch	DPS-X-BK		SU	087100
1	Power Supply	AQD x Amps Required		SU	087100
1	Card Reader	By Security Contractor		OT	

Set: 5.0

Doors: A118
Description: EXTERIOR HM PAIR EXIT ONLY STC

2	Continuous Hinge	CFM83HD1		PE	087100
1	Mullion	CR972BKM 7'2" CT7R		RU	087100
2	Rim Exit Device, Exit Only	ED5200S EO	630	RU	087100
2	Surface Closer w/ Hvy Dty Stop	DC8210 A11	Match	RU	087100
2	Kick Plate	K1050 10" BEV CSK	US32D	RO	087100
1	Rain Guard	346C + 4" ODW		PE	087100
1	Gasketing (Mullion)	5110BL		PE	087100
1	Acoustic Seal Set (Includes STC Threshold, Astragal)	PEMKOSTCSET-2A	BL	PE	087100
2	Door Bottom	420APKL 36"		PE	087100

Set: 6.0

Doors: A101E

Description: EXTERIOR HM PAIR EXIT ONLY RIM EXIT (BLACK FINISH)

2 Continuous Hinge	BSPFM83HDI		PE	087100
1 Mullion	CR972BKM 7'2" CT7R		RU	087100
2 Rim Exit Device, Exit Only	ED5200S EO	BSP	RU	087100
1 Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
2 Surface Closer w/ Hvy Dty Stop	DC8210 A11	BSP	RU	087100
1 Gasketing (Mullion)	5110BL		PE	087100
1 Rain Guard	346BSP + 4" ODW		PE	087100
1 Gasketing	2891BSPV		PE	087100
2 Sweep	345BSPNB		PE	087100
1 Threshold	252x3BSPFG		PE	087100

Set: 7.0

Doors: A117B

Description: SGL CLASSROOM FUNCTION OUTSWING (BLACK FINISH)

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	BSP	MK	087100
1 Classroom Lock	ML2055 NSA	BSP	RU	087100
1 Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
1 Surface Closer	DC8210	BSP	RU	087100
1 Kick Plate	K1050 10" CSK BEV	BSP	RO	087100
1 Wall Stop	406	BSP	RO	087100
3 Silencer	608-RKW		RO	087100

Set: 8.0

Doors: A349A, A349B

Description: SGL STOREROOM FUNCTION INSWING RATED (BLACK FINISH)

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	BSP	MK	087100
1 Storeroom Lock	ML2057 NSA	BSP	RU	087100
1 Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
1 Surface Closer	DC8200	BSP	RU	087100
1 Kick Plate	K1050 10" CSK BEV	BSP	RO	087100
1 Wall Stop	406	BSP	RO	087100
1 Gasketing	S773BL		PE	087100

Set: 9.0

Doors: A131

Description: SGL STOREROOM FUNCTION INSWING RATED

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK	087100
1 Storeroom Lock	ML2057 NSA	626	RU	087100
1 Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
1 Surface Closer	DC8200	689	RU	087100
1 Kick Plate	K1050 10" BEV CSK	US32D	RO	087100
1 Wall Stop	406	Match	RO	087100
1 Gasketing	S773BL		PE	087100

Set: 10.0

Doors: A109, A143B, A145, A154, A203
Description: SGL STOREROOM FUNCTION INSWING

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK	087100
1 Storeroom Lock	ML2057 NSA	626	RU	087100
1 Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
1 Surface Closer	DC8200	689	RU	087100
1 Stop (Wall / Floor)	406 / 481 To Suit	US26D	RO	087100
3 Silencer	608-RKW		RO	087100

Set: 11.0

Doors: A120B, A126
Description: SGL STOREROOM FUNCTION INSWING KP

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK	087100
1 Storeroom Lock	ML2057 NSA	626	RU	087100
1 Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
1 Surface Closer	DC8200	689	RU	087100
1 Kick Plate	K1050 10" BEV CSK	US32D	RO	087100
1 Stop (Wall / Floor)	406 / 481 To Suit	US26D	RO	087100
3 Silencer	608-RKW		RO	087100

Set: 12.0

Doors: A102B
Description: SGL STOREROOM FUNCTION OUTSWING

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK	087100
1 Storeroom Lock	ML2057 NSA	626	RU	087100
1 Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100

1	Surface Closer	DC8210	689	RU	087100
1	Stop (Wall / Floor)	406 / 481 To Suit	US26D	RO	087100
3	Silencer	608-RKW		RO	087100

Set: 13.0

Doors: A117A

Description: SGL STOREROOM FUNCTION INSWING WIDE STC

3	Hinge, Cam Lift	MKCL180	Match	MK	087100
1	Storeroom Lock	ML2057 NSA	626	RU	087100
1	Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
1	Surface Closer	DC8200	689	RU	087100
1	Kick Plate	K1050 10" BEV CSK	US32D	RO	087100
1	Stop (Wall / Floor)	406 / 481 To Suit	US26D	RO	087100
1	Acoustic Seal Set (Includes Auto Door Bottom)	PEMKOSTCSET-1A	BL	PE	087100
1	Threshold	151A		PE	087100

Set: 14.0

Doors: A137

Description: SGL STOREROOM FUNCTION INSWING STC

3	Hinge, Cam Lift	MKCL134 4-1/2" x 4-1/2"	Match	MK	087100
1	Storeroom Lock	ML2057 NSA	626	RU	087100
1	Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
1	Surface Closer	DC8200	689	RU	087100
1	Stop (Wall / Floor)	406 / 481 To Suit	US26D	RO	087100
1	Acoustic Seal Set (Includes Auto Door Bottom)	PEMKOSTCSET-1A	BL	PE	087100
1	Threshold	151A		PE	087100

Set: 15.0

Doors: A132, A133, A134

Description: SGL STOREROOM FUNCTION INSWING STC KP

3	Hinge, Cam Lift	MKCL134 4-1/2" x 4-1/2"	Match	MK	087100
1	Storeroom Lock	ML2057 NSA	626	RU	087100
1	Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
1	Surface Closer	DC8200	689	RU	087100
1	Kick Plate	K1050 10" BEV CSK	US32D	RO	087100
1	Stop (Wall / Floor)	406 / 481 To Suit	US26D	RO	087100

1	Acoustic Seal Set (Includes Auto Door Bottom)	PEMKOSTCSET-1A	BL	PE	087100
1	Threshold	151A		PE	087100

Set: 16.0

Doors: A301A, A302B, A304

Description: SGL STOREROOM FUNCTION INSWING STC (BLACK FINISH)

3	Hinge, Cam Lift	MKCL134	Match	MK	087100
1	Storeroom Lock	ML2057 NSA	BSP	RU	087100
1	Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
1	Surface Closer	DC8200	BSP	RU	087100
1	Wall Stop	406	Match	RO	087100
1	Acoustic Seal Set (Includes Auto Door Bottom)	PEMKOSTCSET-1A	BL	PE	087100
1	Threshold	151BSP		PE	087100

Set: 17.0

Doors: A207

Description: SGL STOREROOM FUNCTION INSWING STC (BLACK FINISH) KP

3	Hinge, Cam Lift	MKCL134	Match	MK	087100
1	Storeroom Lock	ML2057 NSA	BSP	RU	087100
1	Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
1	Surface Closer	DC8200	BSP	RU	087100
1	Kick Plate	K1050 10" CSK BEV	BSP	RO	087100
1	Wall Stop	406	Match	RO	087100
1	Acoustic Seal Set (Includes Auto Door Bottom)	PEMKOSTCSET-1A	BL	PE	087100
1	Threshold	151BSP		PE	087100

Set: 18.0

Doors: A102, A104, A107

Description: SGL STOREROOM FUNCTION INSWING (BLACK FINISH) WIDE

3	Hinge, Full Mortise, Hvy Wt	T4A3786 5" x 4-1/2"	BSP	MK	087100
1	Storeroom Lock	ML2057 NSA	BSP	RU	087100
1	Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
1	Surface Closer	DC8200	BSP	RU	087100
1	Kick Plate	K1050 10" CSK BEV	BSP	RO	087100
1	Wall Stop	406	BSP	RO	087100

3 Silencer	608-RKW		RO	087100

Set: 19.0

Doors: A103B, A300, A303

Description: SGL STOREROOM FUNCTION INSWING (BLACK FINISH)

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	BSP	MK	087100
1 Storeroom Lock	ML2057 NSA	BSP	RU	087100
1 Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
1 Surface Closer	DC8200	BSP	RU	087100
1 Wall Stop	406	BSP	RO	087100
3 Silencer	608-RKW		RO	087100

Set: 20.0

Doors: A302A

Description: SGL STOREROOM FUNCTION OUTSWING (BLACK FINISH)

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	BSP	MK	087100
1 Storeroom Lock	ML2057 NSA	BSP	RU	087100
1 Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
1 Surface Closer	DC8210	BSP	RU	087100
1 Wall Stop	406	BSP	RO	087100
3 Silencer	608-RKW		RO	087100

Set: 21.0

Doors: A116B

Description: SGL STOREROOM FUNCTION INSWING WIDE RATED

3 Hinge, Full Mortise, Hvy Wt	T4A3786 5" x 4-1/2"	US26D	MK	087100
1 Storeroom Lock	ML2057 NSA	626	RU	087100
1 Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
1 Surface Closer	DC8200	689	RU	087100
1 Kick Plate	K1050 10" BEV CSK	US32D	RO	087100
1 Stop (Wall / Floor)	406 / 481 To Suit	US26D	RO	087100
1 Gasketing	S773BL		PE	087100

Set: 22.0

Doors: A116D

Description: SGL STOREROOM FUNCTION OUTSWING WIDE RATED CLOSER/STOP

3 Hinge, Full Mortise, Hvy Wt	T4A3786 5" x 4-1/2"	US26D	MK	087100

1 Storeroom Lock	ML2057 NSA	626	RU	087100
1 Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
1 Surface Closer w/ Stop	DC8210 A4	689	RU	087100
1 Kick Plate	K1050 10" BEV CSK	US32D	RO	087100
1 Gasketing	S773BL		PE	087100

Set: 23.0

Doors: A124B, A125
Description: PAIR A/I STOREROOM FUNCTION RATED

6 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK	087100
1 Dust Proof Strike	570	US26D	RO	087100
1 Flush Bolt	2945	US26D	RO	087100
1 Storeroom Lock	ML2057 NSA	626	RU	087100
1 Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
1 Coordinator	1700	US28	RO	087100
2 Surface Closer	DC8200	689	RU	087100
2 Kick Plate	K1050 10" BEV CSK	US32D	RO	087100
2 Wall Stop	406	Match	RO	087100
1 Astragal	18041CNB		PE	087100
1 Gasketing	S773BL		PE	087100

Set: 24.0

Doors: A143A
Description: PAIR A/I STOREROOM FUNCTION

6 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK	087100
1 Dust Proof Strike	570	US26D	RO	087100
1 Flush Bolt	2945	US26D	RO	087100
1 Storeroom Lock	ML2057 NSA	626	RU	087100
1 Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
1 Coordinator	1700	Black	RO	087100
2 Surface Closer	DC8200	689	RU	087100
2 Kick Plate	K1050 10" BEV CSK	US32D	RO	087100
2 Wall Stop	406	Match	RO	087100
1 Astragal	18041CNB		PE	087100
2 Silencer	608-RKW		RO	087100

Set: 25.0

Doors: A115, A115B
Description: SGL STOREROOM FUNCTION RIM EXIT RATED

3	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK	087100
1	Fire Rated Rim Exit, Storeroom	ED5200SA N959ET	630	RU	087100
1	Rim Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
1	Surface Closer	DC8210	689	RU	087100
1	Wall Stop	406	Match	RO	087100
1	Gasketing	S773BL		PE	087100

Set: 26.0

Doors: A123
Description: SGL STOREROOM FUNCTION RIM RATED WIDE STC

3	Hinge, Cam Lift	MKCL180	Match	MK	087100
1	Fire Rated Rim Exit, Storeroom	ED5200SA N959ET	630	RU	087100
1	Rim Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
1	Surface Closer	DC8210	689	RU	087100
1	Kick Plate	K1050 10" BEV CSK	US32D	RO	087100
1	Wall Stop	406	Match	RO	087100
1	Acoustic Seal Set (Includes Auto Door Bottom)	PEMKOSTCSET-1A	BL	PE	087100
1	Threshold	151A		PE	087100

Set: 27.0

Doors: E106B
Description: SGL STOREROOM FUNCTION RIM EXIT RATED CLOSER/STOP

3	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK	087100
1	Fire Rated Rim Exit, Storeroom	ED5200SA N959ET	630	RU	087100
1	Rim Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
1	Surface Closer w/ Hvy Dty Stop	DC8210 A11	Match	RU	087100
1	Kick Plate	K1050 10" BEV CSK	US32D	RO	087100
1	Gasketing	S773BL		PE	087100

Set: 28.0

Doors: E101, E104
Description: SGL STOREROOM FUNCTION (NO CLOSER) STC

3	Hinge, Cam Lift	MKCL134 4-1/2" x 4-1/2"	Match	MK	087100
1	Storeroom Lock	ML2057 NSA	626	RU	087100
1	Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100

1	Wall Stop	406	Match	RO	087100
1	Acoustic Seal Set (Includes Auto Door Bottom)	PEMKOSTCSET-1A	BL	PE	087100
1	Threshold	151A		PE	087100

Set: 29.0

Doors: E100A, E100B, E100C, E106A, E106C

Description: PAIR STOREROOM FUNCTION SVR STC

6	Hinge, Cam Lift	MKCL180	Match	MK	087100
1	Surf Vert Rod, Storeroom	ED5470B N959ET M55	630	RU	087100
1	Surf Vert Rod, Dummy	ED5470B N950ET M55	630	RU	087100
1	Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
2	Surface Closer w/ Hvy Dty Stop	DC8210 A11	Match	RU	087100
2	Kick Plate	K1050 10" BEV CSK	US32D	RO	087100
1	Acoustic Seal Set (Includes STC Threshold, Astragal)	PEMKOSTCSET-2A	BL	PE	087100

Notes: AT NON-RATED OPENINGS PROVIDE ED5400 PANIC DEVICES IN LIEU OF ED5470B.

A135: OMIT KICK PLATE.

Set: 30.0

Doors: A111A, A146A, A206A, A208A

Description: PAIR SVR x PULLS STC (BLACK FINISH)

6	Hinge, Cam Lift	MKCL180	Match	MK	087100
1	Surface Vert Rod Exit	PED5450T M52 K157ET M55	BSP	RU	087100
1	Surface Vert Rod Exit	PED5440 EO M55 M52	BSP	RU	087100
1	Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
2	Pull	RM3101-48 Mtg-Type 12XHD	BSP	RO	087100
2	Surface Closer w/ Hvy Dty Stop	DC8210 A11	BSP	RU	087100
1	Acoustic Seal Set (Includes STC Threshold, Astragal)	PEMKOSTCSET-2A	BL	PE	087100

Notes: MOUNT PULLS 7" FROM DOOR EDGE SO AS NOT TO BE AN OBSTRUCTION TO KEYED CYLINDER.

Set: 31.0

Doors: A135B

Description: PAIR STOREROOM FUNCTION SVR STC RATED (BLACK FINISH)

6	Hinge, Cam Lift	MKCL180	Match	MK	087100	
1	Fire Rated Surf Vert Rod, Storeroom	ED5470B N959ET M55	BSP	RU	087100	
1	Fire Rated Surf Vert Rod, Dummy	ED5470B N950ET M55	BSP	RU	087100	
1	Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100	
2	Surface Closer	DC8210	BSP	RU	087100	
2	Kick Plate	K1050 10" CSK BEV	BSP	RO	087100	
2	Wall Stop	406	BSP	RO	087100	
1	Acoustic Seal Set (Includes STC Threshold, Astragal)	PEMKOSTCSET-2A	BL	PE	087100	

Set: 32.0

Doors: A101C

Description: PAIR STOREROOM FUNCTION SVR RATED MHO (CORRIDOR)

2	Continuous Hinge	CFM83HD1		PE	087100	
1	Surf Vert Rod, Storeroom	ED5470B N959ET M55	630	RU	087100	
1	Surf Vert Rod, Dummy	ED5470B N950ET M55	630	RU	087100	
1	Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100	
2	Surface Closer	DC8210 A3	689	RU	087100	
2	Kick Plate	K1050 10" BEV CSK	US32D	RO	087100	
2	Electromagnetic Holder	998M	689	RF	087100	
1	Astragal	18041CNB		PE	087100	
1	Gasketing	S773BL		PE	087100	

Set: 33.0

Doors: A112, A127

Description: PAIR STOREROOM FUNCTION SVR MHO (CORRIDOR)

2	Continuous Hinge	CFM83HD1		PE	087100	
1	Surf Vert Rod, Storeroom	ED5470 N959ET M55	630	RU	087100	
1	Surface Vert Rod Exit, Dummy	ED5470 N950ET M55	630	RU	087100	
1	Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100	
2	Surface Closer	DC8210 A3	689	RU	087100	
2	Kick Plate	K1050 10" BEV CSK	US32D	RO	087100	
2	Electromagnetic Holder	998M	689	RF	087100	
1	Astragal	18041CNB		PE	087100	
2	Silencer	608-RKW		RO	087100	

Set: 34.0

Doors: A127B

Description: PAIR STOREROOM FUNCTION SVR MHO (CORRIDOR) RATED

2	Continuous Hinge	CFM83HD1		PE	087100
1	Surf Vert Rod, Storeroom	ED5470B N959ET M55	630	RU	087100
1	Surf Vert Rod, Dummy	ED5470B N950ET M55	630	RU	087100
1	Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
2	Surface Closer	DC8210 A3	689	RU	087100
2	Kick Plate	K1050 10" BEV CSK	US32D	RO	087100
2	Electromagnetic Holder	998M	689	RF	087100
1	Astragal	18041CNB		PE	087100
1	Gasketing	S773BL		PE	087100

Set: 35.0

Doors: A112A

Description: PAIR CARD READER SVR MHO (CORRIDOR)

2	Continuous Hinge	CFM83HD1 EL-CEPTx32D		PE	087100
1	Electrified SVR Exit, Fail Secure	ED5470 N9905ET M55 M92	630	RU	087100
1	Surface Vert Rod Exit, Dummy	ED5470 N950ET M55 M92	630	RU	087100
1	Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
2	Surface Closer	DC8210	689	RU	087100
2	Electromagnetic Holder	998M	689	RF	087100
1	Astragal	18041CNB		PE	087100
2	Silencer	608-RKW		RO	087100
2	ElectroLynx Harness	QC-C2500P		MK	087100
2	ElectroLynx Harness	QC-C300P		MK	087100
2	Position Switch	DPS-X-GY		SU	087100
1	Power Supply	AQD x Amps Required		SU	087100
1	Card Reader	By Security Contractor		OT	

Set: 36.0

Doors: A121A

Description: PAIR STOREROOM FUNCTION SVR WIDE STC

8	Hinge, Cam Lift	MKCL180	Match	MK	087100
1	Surf Vert Rod, Storeroom	ED5470 N959ET M55	630	RU	087100
1	Surface Vert Rod Exit, Dummy	ED5470 N950ET M55	630	RU	087100
1	Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
2	Surface Closer	DC8210 A3	689	RU	087100

2	Kick Plate	K1050 10" BEV CSK	US32D	RO	087100
2	Wall Stop	406	Match	RO	087100
1	Gasketing (Mullion)	5110BL		PE	087100
1	Acoustic Seal Set (Includes STC Threshold, Astragal)	PEMKOSTCSET-2A	BL	PE	087100

Set: 37.0

Doors: E100D

Description: PAIR STOREROOM FUNCTION SVR KP

6	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK	087100
1	Surf Vert Rod, Storeroom	ED5470 N959ET M55	630	RU	087100
1	Surface Vert Rod Exit, Dummy	ED5470 N950ET M55	630	RU	087100
1	Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
2	Surface Closer	DC8210	689	RU	087100
2	Kick Plate	K1050 10" BEV CSK	US32D	RO	087100
2	Wall Stop	406	Match	RO	087100
1	Astragal	18041CNB		PE	087100
1	Gasketing	S773BL		PE	087100

Set: 38.0

Doors: A300A

Description: PAIR STOREROOM FUNCTION SVR

6	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK	087100
1	Surf Vert Rod, Storeroom	ED5470 N959ET M55	630	RU	087100
1	Surface Vert Rod Exit, Dummy	ED5470 N950ET M55	630	RU	087100
1	Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
2	Surface Closer	DC8210	689	RU	087100
2	Wall Stop	406	Match	RO	087100
1	Astragal	18041CNB		PE	087100
1	Gasketing	S773BL		PE	087100

Set: 39.0

Doors: A205

Description: SGL STOREROOM FUNCTION RIM EXIT (BLACK FINISH)

3	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	BSP	MK	087100
1	Rim Exit Device, Storeroom	ED5200S N959ET	BSP	RU	087100
1	Rim Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
1	Surface Closer w/ Stop	DC8210 A4	BSP	RU	087100

1 Kick Plate	K1050 10" CSK BEV	BSP	RO	087100
3 Silencer	608-RKW		RO	087100

Set: 40.0

Doors: A144B
Description: SGL STOREROOM FUNCTION RIM EXIT RATED (BLACK FINISH) RATED

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	BSP	MK	087100
1 Fire Rated Rim Exit, Storeroom	ED5200SA N959ET	BSP	RU	087100
1 Rim Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
1 Surface Closer w/ Stop	DC8210 A4	BSP	RU	087100
1 Kick Plate	K1050 10" CSK BEV	BSP	RO	087100
1 Gasketing	S773BL		PE	087100

Set: 41.0

Doors: A108
Description: SGL PRIVACY FUNCTION INSWING (BLACK FINISH)

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	BSP	MK	087100
1 Privacy Lock	ML2030 NSA M19V	BSP	RU	087100
1 Surface Closer	DC8200	BSP	RU	087100
1 Wall Stop	406	BSP	RO	087100
3 Silencer	608-RKW		RO	087100

Set: 42.0

Doors: A128B, A129B, A138
Description: SGL PRIVACY FUNCTION INSWING

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK	087100
1 Privacy Lock	ML2030 NSA M19V	626	RU	087100
1 Surface Closer	DC8200	689	RU	087100
1 Wall Stop	406	Match	RO	087100
3 Silencer	608-RKW		RO	087100

Set: 43.0

Doors: A128A, A129A, A130
Description: SGL PRIVACY/ENTRANCE FUNCTION CLOSER/STOP RATED

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK	087100
1 Entrance Lock w/ Indicator	ML2024 NSVN V33	626	RU	087100
1 Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100

1	Surface Closer w/ Stop	DC8210 A4	689	RU	087100
1	Gasketing	S773BL		PE	087100

Set: 44.0

Doors: A139
Description: SGL ENTRY FUNCTION CLOSER/STOP

3	Hinge, Full Mortise, Hvy Wt	T4A3786 5" x 4-1/2"	US26D	MK	087100
1	Entrance Lock	ML2024 NSA	626	RU	087100
1	Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
1	Surface Closer w/ Stop	DC8210 A4	689	RU	087100
3	Silencer	608-RKW		RO	087100

Set: 45.0

Doors: E102A, E102B, E103
Description: SGL ENTRY FUNCTION STC

3	Hinge, Cam Lift	MKCL134 4-1/2" x 4-1/2"	Match	MK	087100
1	Entrance Lock	ML2024 NSA	626	RU	087100
1	Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
1	Wall Stop	406	Match	RO	087100
1	Acoustic Seal Set (Includes Auto Door Bottom)	PEMKOSTCSET-1A	BL	PE	087100
1	Threshold	151A		PE	087100

Set: 46.0

Doors: A106
Description: SGL ENTRY FUNCTION INSWING (BLACK FINISH)

3	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	BSP	MK	087100
1	Entrance Lock	ML2024 NSA	BSP	RU	087100
1	Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
1	Surface Closer	DC8200	BSP	RU	087100
1	Wall Stop	406	BSP	RO	087100
3	Silencer	608-RKW		RO	087100

Set: 47.0

Doors: A140
Description: SGL ENTRY FUNCTION NO CLOSER

3	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK	087100

1	Entrance Lock	ML2024 NSA	626	RU	087100
1	Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
1	Wall Stop	406	Match	RO	087100
3	Silencer	608-RKW		RO	087100

Set: 48.0

Doors: A121C

Description: SGL PUSH/PULL (BSP FINISH) WIDE

3	Hinge, Full Mortise, Hvy Wt	T4A3786 5" x 4-1/2"	BSP	MK	087100
1	Pull	RM3101-48 Mtg-Type 12XHD	BSP	RO	087100
1	Push Plate	RM1010	US32	RO	087100
1	Surface Closer	DC8210	BSP	RU	087100
1	Kick Plate	K1050 10" CSK BEV	BSP	RO	087100
1	Wall Stop	406	BSP	RO	087100
1	Gasketing	S773BL		PE	087100

Set: 49.0

Doors: A344

Description: SGL PASSAGE FUNCTION RIM EXIT STC (BLACK FINISH)

3	Hinge, Cam Lift	MKCL134	Match	MK	087100
1	Rim Exit Device, Passage	ED5200S N910ET	BSP	RU	087100
1	Surface Closer	DC8210	BSP	RU	087100
1	Kick Plate	K1050 10" CSK BEV	BSP	RO	087100
1	Wall Stop	406	BSP	RO	087100
1	Acoustic Seal Set (Includes Auto Door Bottom)	PEMKOSTCSET-1A	BL	PE	087100
1	Gasketing	S773BL		PE	087100
1	Threshold	151BSP		PE	087100

Set: 50.0

Doors: A144C

Description: SGL PASSAGE FUNCTION RIM EXIT STC

3	Hinge, Cam Lift	MKCL134	Match.	MK	087100
1	Rim Exit Device, Passage	ED5200S N910ET	630	RU	087100
1	Surface Closer	DC8210	689	RU	087100
1	Kick Plate	K1050 10" BEV CSK	US32D	RO	087100
1	Wall Stop	406	Match	RO	087100
1	Acoustic Seal Set (Includes Auto Door Bottom)	PEMKOSTCSET-1A	BL	PE	087100
1	Gasketing	S773BL		PE	087100

1 Threshold	151A		PE	087100

Set: 51.0

Doors: A144A

Description: SGL PASSAGE FUNCTION RIM EXIT (BLACK FINISH)

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	BSP	MK	087100
1 Rim Exit Device, Passage	ED5200S N910ET	BSP	RU	087100
1 Surface Closer	DC8210	BSP	RU	087100
1 Kick Plate	K1050 10" CSK BEV	BSP	RO	087100
1 Wall Stop	406	BSP	RO	087100
1 Gasketing	S773BL		PE	087100

Set: 52.0

Doors: A105, A110, A202, A204

Description: SGL PUSH / PULL (BLACK FINISH)

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	BSP	MK	087100
1 Deadbolt	DL4117	BSP	RU	087100
1 Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
1 Push Plate	RM1010	US32	RO	087100
1 Pull	RM3101-12 Mtg-Type 12XHD	BSP	RO	087100
1 Surface Closer	DC8200	BSP	RU	087100
1 Kick Plate	K1050 10" CSK BEV	BSP	RO	087100
1 Mop Plate	K1050 6" CSK BEV	BSP	RO	087100
1 Wall Stop	406	BSP	RO	087100
3 Silencer	608-RKW		RO	087100

Set: 53.0

Doors: A135A

Description: PAIR PUSH/PULL (BSP FINISH) KP

6 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	BSP	MK	087100
2 Pull	RM3101-48 Mtg-Type 12XHD	BSP	RO	087100
2 Push Plate	RM1010	US32	RO	087100
2 Surface Closer	DC8210	BSP	RU	087100
2 Kick Plate	K1050 10" CSK BEV	BSP	RO	087100
2 Wall Stop	406	BSP	RO	087100
1 Astragal	18041BSPNB		PE	087100
1 Gasketing	S773BL		PE	087100

Notes:

Set: 54.0

Doors: A111B, A146B, A206B, A208B
Description: PAIR PUSH/PULL (BSP FINISH)

6	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	BSP	MK	087100
2	Pull	RM3101-48 Mtg-Type 12XHD	BSP	RO	087100
2	Push Plate	RM1010	US32	RO	087100
2	Surface Closer	DC8210	BSP	RU	087100
2	Wall Stop	406	BSP	RO	087100
1	Astragal	18041BSPNB		PE	087100
1	Gasketing	S773BL		PE	087100

Notes: MOUNT PULLS 7" FROM EDGE OF DOOR.

Set: 55.0

Doors: A103C, A114A, A116A, A116C, A119, A120A, A121B, A124A
Description: OVERHEAD DOOR

1	Rim Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
1	Balance of Hardware	By Assembly Manufacturer		OT	

Set: 56.0

Doors: A205A
Description: SGL CARD READER LOCK OUTSWING WIDE

3	Hinge, Full Mortise, Hvy Wt	T4A3786 5" x 4-1/2"	US26D	MK	087100	
1	Electric Power Transfer	CEPT-10	630	SU	087100	⚡
1	Fail Secure Lock	ML20906-SEC NSA M92	626	RU	087100	⚡
1	Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100	
1	Surface Closer	DC8210	689	RU	087100	
1	Wall Stop	406	Match	RO	087100	
3	Silencer	608-RKW		RO	087100	
1	ElectroLynx Harness	QC-C2500P		MK	087100	⚡
1	ElectroLynx Harness	QC-C300P		MK	087100	⚡
1	Position Switch	DPS-X-GR		SU	087100	⚡
1	Power Supply	AQD x Amps Required		SU	087100	⚡
1	Card Reader	By Security Contractor		OT		

Set: 57.0

Doors: A142
Description: SGL CARD READER LOCK INSWING WIDE

3	Hinge, Full Mortise, Hvy Wt	T4A3786 5" x 4-1/2"	US26D	MK	087100
1	Electric Power Transfer	CEPT-10	630	SU	087100
1	Fail Secure Lock	ML20906-SEC NSA M92	626	RU	087100
1	Mortise Cylinder/Core	Match Existing Pyramid LFIC Key System	Match	RU	087100
1	Surface Closer	DC8200	689	RU	087100
1	Wall Stop	406	Match	RO	087100
3	Silencer	608-RKW		RO	087100
1	ElectroLynx Harness	QC-C2500P		MK	087100
1	ElectroLynx Harness	QC-C300P		MK	087100
1	Position Switch	DPS-X-GR		SU	087100
1	Power Supply	AQD x Amps Required		SU	087100
1	Card Reader	By Security Contractor		OT	

Set: 58.0

Doors: A101M, A101N
Description: OPENING(S) NOT FOUND

1	Openings	Not Found	OT

Notes: OPENINGS LISTED IN DOOR SCHEDULE, NOT TAGGED ON FLOOR PLANS.

END OF SECTION 087100

SECTION 11 61 23

THEATRICAL AND ACOUSTIC DRAPERY AND TRACK

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes all labor, materials, equipment, and services necessary to manufacture and deliver to job site and install the stage drapery and track as shown on the drawings and/or listed in schedules.

B. Related work in other Sections:
1. 116133 – Motorized Stage Rigging
2. 116136 – Counterweight Stage Rigging and Pin Rails
3. 116137 – Fixed Lighting Positions

1.2 SUBMITTALS

A. Submit shop drawings for review before fabrication can begin. Such review does not relieve the Manufacturer of the responsibility of providing equipment in accordance with this Specification.
1. Show each type of curtain track plus the method and equipment to be used in hanging the curtain track.
   a. Catalog work sheets showing illustrated cuts of items may be submitted for standard manufactured items.
2. Provide field verified dimensions of all drapery and track.
3. Show exact locations for work required of other trades, including all welded, concrete, or masonry connections.
   a. Where items must fit and coordinate with finished surfaces and/or constructed spaces, take measurements at site and not from drawings.
   b. Furnish drawings and coordinate all work required of other trades that affects the work of this section.

B. Product Data: for Drapery Track and Textiles

C. Samples:
1. Manufacturer’s color line sample card
2. 1/2-yard x full width minimum size sample of each color of each fabric type, including custom colors matched to architects control sample.
3. Label each sample with Manufacturer and Manufacturer's identification numbers.
4. Guarantee dye lots for all materials.

D. No extras will be allowed due to the Manufacturer's misunderstanding as to the amount of work involved or lack of knowledge of any field conditions based on neglect or failure to make field measurements or thorough investigation of the job site.

E. Provide Operations and Maintenance manuals containing record shop drawings, operation instructions and recommended maintenance procedures for all equipment, in quantity outlined in Division 01.

F. Product certificates: for each drapery fabric treated with flame retardant, signed by fabric supplier and indicating treating durability and cleaning procedures required to maintain treatment effectiveness.

1.3 MANUFACTURERS RESPONSIBILITIES

A. Study the contract drawings and specifications with regard to the work as shown and required under this section so as to insure its completeness.

B. Manufacture and install equipment complete in all respects and to provide any additional equipment required to fulfill the intent of these drawings and specifications regardless of whether or not such items are herein specified or indicated.

C. Verify all dimensions affecting the work.

1.4 CONTRACTORS RESPONSIBILITIES

A. Verify that the job conditions are ready to receive work in this section. Contractor must bring forth any existing conditions that may adversely affect execution of work, so that resolution may be reached before commencement of installation

1.5 DELIVERY

A. Bid price shall include full freight and insurance charges for the delivery of all drapery items to the job site.

B. If, through no fault of the Owner, the timely completion of the work of this section is imperiled, the Manufacturer shall prevent or minimize any delay by shipping the required products by airfreight, at no additional cost to the Owner.
   1. This requirement covers initial delivery of fabrics to the Drapery Manufacturer, and delivery of finished drapery to the job site.

C. Carefully wrap and seal each drapery item tight for shipment in rigid and waterproof wrapping material to insure against impact and water damage during shipment.

1.6 WARRANTY

A. Manufacturer agrees to make all repairs, including replacement of materials, made necessary due to defects in workmanship and materials without additional cost to the Owner for a period of two years from the date of acceptance.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers for work in this section:
   1. BellaTEX Stage Curtains
      Jackson, TN
      (731) 300-3141
      http://bellatex.com/
   2. I. Weiss Inc.
      Fairview, NJ
      (201) 402-6500
      https://www.iweiss.com/
   3. Rose Brand
      Secaucus, NJ
      (201) 809-1730
      https://www.rosebrand.com/
   4. Stage Decorations and Supplies
      Greensboro, NC
      (888) 220-3174
      http://www.stagedec.com/

2.2 FABRICS

A. All fabrics shall be inherently flame retardant and shall meet all requirements set forth in NFPA #701, Large and Small Scale.
   1. Furnish affidavit of flame proofing in the form acceptable to local authorities.

B. The following fabrics are approved for drapery use:
   1. Surround Drapery: Encore, 22 oz. Trevira CS, 54-inch-wide, IFR, supplied by Milliken & Company, Spartansburg, SC
   2. Cyclorama: Seamless IFR Trevira CS “muslin”
   3. Green Screen: Chroma Key green; 100% polyester 38.71 oz., 128-inch-wide, IFR, supplied by Milliken & Company, Spartansburg, SC

2.3 TOP FINISH TYPES

A. Webbing:
   1. 3-inch-wide polypropylene webbing
   2. Double layer hemmed fabric
   3. No visible selvage or fabric edge
   4. Mark centerline of drape on webbing in indelible ink

B. Grommets with Tie Line:
   1. 12-inch centers
      a. First grommet at center or split center
      b. Last grommet within 2 inches of offstage edges

2. Grommets: #2 or #3 brass type
3. Tie lines: #4 braided masonry line
   a. 36 inches long
   b. Color: Black, unless otherwise noted
   c. Choke tie lines into grommets
   d. Provide single white tie line at center grommet or both grommets that split center

C. Snap Hooks:
1. Installed to top webbing with 2-inch nylon straps
2. Hooks flush to top of drape for installation to track carriers

2.4 BOTTOM FINISH TYPES

A. Flat:
1. 4-inch hemmed return
2. Binding tape pressed between layers prior to stitching

B. Chain Pocket:
1. 5-inch wrapping an internal nylon pocked
   a. Lined with #8 jack chain
   b. Whip-stitch chain to pocket at 12-inch intervals to prevent shifting
2. Float chain in pocket 1 inch above bottom of drape.

C. Lead Weight:
1. 4-inch hemmed tape wrap

D. Pipe Pocket and Flap:
1. 4-inch, #8 canvas or nylon pocket for 1/2-inch pipe, sewn onto back of the bottom hem
2. Provide reinforced openings along pocket at 10-foot nominal centers for partial piping and insertion

2.5 SIDE FINISH TYPES

A. Flat:
1. 4-inch hemmed return
2. Binding tape pressed between layers prior to stitching
3. Hide selvage or fabric edge inside double fold side hem

B. Flat with Grommets and Ties:
1. 4-inch hemmed return
2. Binding tape pressed between layers prior to stitching
3. Hide selvage or fabric edge inside double fold side hem
4. Grommets and Tie Lines:
   a. 12-inch centers
   b. Grommets:
      1) #2 or #3 brass type
   c. Tie lines:
      1) #4 braided masonry line
      2) 36 inches long
      3) Color: black unless otherwise noted
      4) Choke tie lines into grommets

2.6 DRAPERY

A. General:
1. Stitch with nylon thread without flaws
   a. Each width of cloth continuous for the full height of the drapery with no horizontal seams or piercing

2.7 DRAPERY

A. General:
1. Stitch with nylon thread without flaws
   a. Each width of cloth continuous for the full height of the drapery with no horizontal seams or piercing

B. Valance Drapery Panel:
1. Color: TBD
2. Vertical Seams

3. Fullness: As scheduled – box pleat
4. Top: Webbing and grommets with tie line
5. Bottom: size as scheduled, Lead Weight
6. Sides: size as scheduled, Flat
7. Attach to:

C. Velour Bi-Part Curtain Panels (Main Drape and Travelers):
1. Main Drape Color: TBD
2. Traveler Color: Black
3. Vertical seams
4. Fullness: As scheduled – box pleat
5. Top: Webbing and snap hooks
6. Bottom: size as scheduled, Lead Weight
7. Sides: size as scheduled, Flat

D. Velour Borders:
1. Color: Black
2. Vertical seams
3. Fullness: as scheduled – box pleat
4. Top: Webbing and grommets with tie line
5. Bottom: size as scheduled, Lead Weight
6. Sides: Flat

E. Velour Legs and Tabs:
1. Color: Black
2. Vertical seams
3. Fullness: as scheduled – box pleat
4. Top: Webbing and grommets with tie line
5. Bottom: size as scheduled, Lead Weight
6. Sides: Flat

F. Sharkstooth Scrims:
1. Color: Black
2. Seamless
3. Top: Webbing and grommets with tie line
4. Reinforce Top with a piece of 3-inch wide #8 canvas in between the scrim and the webbing
5. Bottom: Pipe Pocket and Flap
6. Side: Flat

G. Cyclorama Panels:
1. Color: White
2. Seamless
3. Top: Snap Hooks
4. Bottom: Pipe Pocket and Flap
5. Side: Flat

2.8 CURTAIN TRACKS

A. Verify all track lengths in the field before fabrication.

B. Bi-Parting Traveler Drapery Curtain Tracks:
1. Provide all hardware required for cord-operated ADC 2800 (BL) or H&H 400 series curtain track system in lengths and locations as shown on the drawings.
   a. Complete with all necessary accessories (CWANA), including hanging clamps, track splices, master carriers, single carriers, center pipe supports, and end stops for all tracks.
   b. Track and hardware color: Natural Finish
   c. Furnish adequate carriers to serve number of drapery grommets, plus 10% spare carriers.
   d. Equip with backpack/rear fold devices for offstage curtain gathering.
   e. Track:
      1) Minimum 14-gauge galvanized steel construction
      2) Continuous, full lengths with as few joints as possible.

C. Walk Along Curtain Tracks:
1. Provide all hardware required for walk along ADC 1400 (BL) or H&H 300 Series curtain track system in lengths and locations as shown on the drawings.
   a. Complete with all necessary accessories (CWANA), including hanging clamps, track splices, master carriers, single carriers, center pipe supports, and end stops for all tracks.

b. Track color: Mill Finish
c. Hardware color: Natural Finish
d. Furnish adequate carriers to serve number of drapery grommets, plus 10% spare carriers.
e. Track:
1) Minimum 11-gauge extruded aluminum
a) Continuous, full lengths with as few joints as possible.
f. Tag line
1) Tie a #8 cotton braided masonry cord at the lead carrier on the end of each drape
2) Line length: from carrier to 4 feet above finished floor
2. Suspend from structure or pipe battens as indicated on drawings
a. Must permit adjustment of height as well as simple re-positioning of the system when required
b. Support spacing per manufacturer, min.

D. Architectural Lighting Tracks:
1. Provide all hardware required for walk along ADC 1400 (BL) or H&H 300 Series curtain track system in lengths and locations as shown on the drawings.
a. Complete with all necessary accessories (CWANA), including hanging clamps, track splices, master carriers, single carriers, center pipe supports, and end stops for all tracks.
b. Track color: Black
c. Hardware color: Black
d. Furnish adequate carriers to serve number of architectural lighting fixtures.
e. Track:
1) Minimum 11-gauge extruded aluminum
a) Continuous, full lengths with as few joints as possible.
f. Tag line
1) Tie a #8 cotton braided masonry cord at the lead carrier on the end of each drape
2) Line length: from carrier to 4 feet above finished floor
2. Suspend from structure or pipe battens as indicated on drawings
a. Must permit adjustment of height as well as simple re-positioning of the system when required
b. Support spacing per manufacturer, min.

2.9 ACCESSORIES

A. Furnish 1/2" NPS schedule 40 steel pipe or 3/4” IMT conduit, threaded and coupled, for use as curtain panel bottom stretcher.
1. Provide enough 10’ lengths of bottom pipe for all items listed in the schedules as having a pipe pocket. Pipes shall be 12” longer than finished drapery.
2. Provide one (1) additional 10’-0” lengths, and one (1) 5’-0” lengths.
3. Provide one (1) end cap and (1) pipe coupler for each pipe segment, to protect fabric during insertion of pipe and to permit joining of segments.

PART 3 - EXECUTION

3.1 INSTALLATION CONTRACTORS

A. Installers for work in this section:
1. Weiss Inc.
Fairview, NJ
(201) 402-6500
https://www.iweiss.com/
2. Barbizon
Carrollton, TX
(972) 416-9930
https://www.barbizon.com/
3. Chicago Flyhouse
Chicago, IL
(773) 533-1590
https://www.flyhouse.com/
4. Clearwing Productions
Denver, CO
(303) 232-3540
https://www.clearwing.com/

5. Texas Scenic Co.
   San Antonio, TX
   (210) 684-0091
   Bronx, NY
   (718) 402-2677
   https://www.texasscenic.com/
6. Wenger Corporation
   Owatonna, MN
   (800) 268-0148
   https://www.wengercorp.com/
7. Protech Theatrical Services, Inc.
   Las Vegas, NV
   (702) 639-0290
   www.protechlv.com

B. Drapery installation Contractor shall be the same Contractor that furnishes and installs the following related Division 11 theatrical systems specified on this project:
   1. 116133 – Motorized Rigging
   2. 116136 – Counterweight Rigging
   3. 116137 – Fixed Lighting Positions
   4. 116139 – Fire Safety Curtain

3.2 GENERAL

A. Examine substrates, area, and conditions for compliance with requirements for installation tolerances, operational clearances, and other conditions affecting performance of the work

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. Responsibility for the satisfactory completion of the work in this section shall rest solely and exclusively with the General Contractor

D. Field verify condition of delivered goods, and repair or replace any components not in factory new condition. All materials shall remain covered or protected from debris, dust, paint, and other site hazards throughout the period between delivery to site and Owner training.

E. Installer shall be responsible for repairing any damage to jobsite surroundings during installation.

F. All components shall be installed plumb, straight, and true, and shall function as designed. Anchors, connecting members, brackets, and associated fastening means and methods for properly supporting and bracing equipment shall be furnished and installed following best suitable practice for each condition.

G. Prior to the completion of the installation, the Installer shall notify the Construction Manager or General Contractor to arrange on a date for observation of the system.
   1. At the time of the observation, the Installer shall furnish sufficient personnel to operate all equipment and to perform adjustments and tests as may be required by the Owner's representatives.
   2. Any equipment that fails to meet with the Specifications shall be repaired or replaced with new equipment, and the inspection shall be re-scheduled under the same conditions listed previously.
   3. Final review will be withheld until all systems have been thoroughly tested and found to be in first class operating condition in every circumstance.

3.3 INSTALLATION SUPERVISION

A. Installation of the Drapery and track system shall be supervised by the Contractor's own experienced superintendent having extensive experience in installing work of this kind.

B. The same individual shall remain in charge of the work throughout the installation of the rigging system until work is completed excepting only the intervention of circumstances completely beyond the control of the Contractor.

C. The superintendent shall represent the Contractor and all directions given to him shall be binding as if given to the Contractor.

D. The Contractor may require the Owner to confirm such directions in writing.

3.4 OWNER TRAINING

A. Manufacturer’s installation Supervisor shall perform Owner training as outlined in Division 01 specifications to include the following:
   1. Operation of curtain tracks.

SECTION 10 12 00

DISPLAY CASES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Display cases.

1.2 DEFINITIONS

A. Display Case: Glazed cabinet with back panel surface and adjustable shelves.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.
1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for display cases. Include furnished specialties and accessories.
2. Include electrical characteristics for illuminated display cases**.**

B. Shop Drawings: For display cases.
1. Include plans, elevations, sections, and attachment details.
2. Show location of seams and joints in back panels.
3. Include sections of typical trim members.
4. Include diagrams for wiring of illuminated display cases.

C. Samples for Initial Selection: For each type of exposed finish.
1. Include Samples of back panels and factory-finished trim involving color finish selection.

D. Samples for Verification: For each type of exposed finish for the following.
1. Back Panel: Not less than 8-1/2 by 11 inches (215 by 280 mm), with facing and substrate indicated for final Work. Include one panel for each type, color, and texture required.
2. Trim: 6-inch- (150-mm-) long sections of each trim profile including corner section.

1.5 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For fabrics, for tests performed by a qualified testing agency.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For display cases to include in maintenance manuals.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install display cases for indoor installations until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

PART 2 - PRODUCTS

~~2.1 MANUFACTURERS~~

~~A. Source Limitations: Obtain display cases from single source from single manufacturer.~~

2.2 PERFORMANCE REQUIREMENTS

A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
1. Flame-Spread Index: 25 or less.

2. Smoke-Developed Index: 50 or less.

B. Electrical Components: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.3 DISPLAY CASES

~~A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:~~
~~1. AJW Architectural Products; Display Cases.~~

B. Recessed Display Case: **Field-fabricated** ~~Factory-fabricated~~ display case; with finished interior, operable glazed doors at front, and trim on face to cover edge of recessed opening.
1. Display Case Cabinet: Extruded aluminum.
2. Face Frame: Aluminum.
3. Aluminum Finish: Color anodic.
   a. Color: Black.

C. Glazed Hinged Doors: Tempered glass; set in frame matching cabinet material and finish. Equip each door with full-height continuous hinge and cylinder lock with two keys.
1. Thickness: Not less than 6 mm thick.
2. Number of Doors: As indicated on Drawings.

D. Shelves: 6-mm-thick tempered glass; supported on adjustable shelf standards and supports.
1. Shelf Depth: As indicated on Drawings.
2. Number of Shelves: As indicated on Drawings.

E. Adjustable Shelf Standards and Supports: BHMA A156.9, B04102; with shelf brackets, B04112; recess mounted in rear surface. Provide standards extending full height of display case.
1. Basis-of-Design Product: Knape & Vogt; 82-inch Series Standard and 182-inch Series Bracket System.
2. Material: Steel.
3. Finish: As selected by Architect from manufacturer's full range.

F. Gypsum Board Back Panel: Gypsum board back panel, as specified in Section 09 29 00 "Gypsum Board."

G. Illumination System: Concealed top-lighting system consisting of fluorescent-strip fixtures. Include lamps and internal wiring with single concealed electrical connection to building system. Coordinate electrical characteristics with power supply provided.
1. Ballasts: Low-temperature, high-power-factor, low-energy, fluorescent lamp ballasts that comply with Certified Ballast Manufacturers Association standards and carry its label.
   a. Electrical Characteristics: Refer to Electrical Engineer's documents.

H. Size: As indicated on Drawings ~~wide~~.

2.4 BACK PANELS

A. Gypsum Board: As specified in Section 09 29 00 "Gypsum Board."

2.5 MATERIALS

A. Extruded-Aluminum Bars and Shapes: ASTM B 221 (ASTM B 221M), Alloy 6063.

B. Aluminum Tubing: ASTM B 429/B 429M, Alloy 6063.

C. Clear Tempered Glass: ASTM C 1048, Kind FT, Condition A, Type I, Class 1, Quality Q3, with exposed edges seamed before tempering.

D. Fasteners: Provide screws, bolts, and other fastening devices made from same material as items being fastened, except provide hot-dip galvanized, stainless steel, or aluminum fasteners for exterior applications. Provide types, sizes, and lengths to suit installation conditions. Use security fasteners where exposed to view.

2.6 FABRICATION

A. Fabricate display cases to requirements indicated for dimensions, design, and thickness and finish of materials.

B. Use metals and shapes of thickness and reinforcing required to produce flat surfaces, and to impart strength for size, design, and application indicated.

C. Fabricate cabinets and door frames with reinforced corners, mitered to a hairline fit, with no exposed fasteners.

D. Fabricate shelf standards plumb and at heights to align shelf brackets for level shelves.

2.7 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM/NOMMA 500 for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.8 ALUMINUM FINISHES

A. Color Anodic Finish: AAMA 611, AA-M12C22A32/A34, Class II, 0.010 mm or thicker.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine walls, with Installer present, for compliance with requirements for installation tolerances, surface conditions of wall, and other conditions affecting performance of the Work.

B. Examine roughing-in for electrical power systems to verify actual locations of connections before installation of illuminated units.

C. Examine walls and partitions for proper backing for display cases.

D. Examine walls and partitions for suitable framing depth if recessed units will be installed.

E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare recesses for display cases as required by type and size of unit.

3.3 INSTALLATION

A. General: Install units in locations and at mounting heights indicated on Drawings, or if not indicated, at heights indicated below. Keep perimeter lines straight, level, and plumb. Provide grounds, clips, backing materials, adhesives, brackets, anchors, trim, and accessories necessary for complete installation.
1. Mounting Height: 72 (1830) inches (mm) above finished floor to top of cabinet.

B. Recessed Display Cases: Attach units to wall framing with fasteners at not more than 16 inches (400 mm) o.c. Attach aluminum trim over edges of recessed display cases and conceal grounds and clips. Attach trim with fasteners at not more than 24 inches (600 mm) o.c.

C. Comply with requirements specified elsewhere for connecting illuminated display cases.

D. Install display case shelving level and straight.

3.4 ADJUSTING AND CLEANING

A. Adjust doors to operate smoothly without warp or bind and so contact points meet accurately. Lubricate operating hardware ~~as recommended in writing by manufacturer~~.

B. Touch up factory-applied finishes to restore damaged areas.

END OF SECTION

2. Installation, dismantling, and storage of draperies.
3. Care and maintenance.
4. Warranty review.

B. Documentation of Owner training shall be furnished as outlined in Division 01 specifications.

END OF SECTION 11 61 23

SECTION 11 61 33

MOTORIZED RIGGING

PART 1 - GENERAL

1.1 WORK OF THIS SECTION

A. This Section includes all labor, materials, equipment, and services necessary to furnish and install the Stage Rigging System as shown on the QT drawings and/or specified herein, including but not limited to the following:
   1. Seven motorized, fully rigged, six line, line sets with cable management and associated equipment.
   2. Mule blocks, idler sheaves, cable rollers or guides as required assuring proper alignment and operation of the rigging system.

B. Related work in other sections:
   1. 116136 – Counterweight Rigging
   2. 116139 – Fire Safety Curtain
   3. 116123 – Drapery and Track
   4. 116113 – Networked Theatrical Lighting Control
   5. 116116 – Theatrical Lighting Wiring Devices
   6. 116163 – Acoustic Equipment

1.2 SUBSITITUTIONS

A. Substitutions are allowed when the substitution improves the quality, decrease installation time, or reduce cost.
   1. Submit a proposal that clearly outlines construction features of the product so that true and accurate comparisons may be made.
      a. Samples of the proposed substation item/s may be requested by the Architect and/or Owner for evaluation

B. No product bid which deviates from the details of the Construction Documents will be considered unless such deviation has been approved in advance by the Architect

1.3 PROJECT CONDITIONS

A. Provide all new equipment of the latest design

B. No extras will be allowed due to the Contractor's misunderstanding of the work involved or its lack of knowledge of any field conditions due to failure to make accurate field measurements or a thorough investigation of the job site.

1.4 SUBMITTALS

A. Stage Rigging Contractor shall prepare and submit complete shop drawings according to the requirements set forth in the Contract Documents.

B. Submit shop drawings for review by the Architect before fabrication can begin. Such review does not relieve the Contractor of the responsibility of providing equipment in accordance with this Specification.

C. Shop Drawings:
   1. Show dimensions, sizes, gauges, thicknesses, finishes, joining, attachments and relationship of work to adjoining construction.
   2. Clearly show power, wire, and conduit requirements for all work to be provided by the Contractor.
   3. Where items must fit and coordinate with finished surfaces and/or constructed spaces, take measurements at site and not from drawings.
   4. Where other materials must be set to exact locations to receive rigging, furnish assistance and directions necessary to permit other trades to locate their work.
   5. Where welded connections, concrete or masonry inserts are required to receive work, show exact locations required and all such drawings shall be furnished to the trades responsible for installing the connectors or inserts.
   6. Show locations of all lubrication points.
   7. Include engineering and load calculations as well as stamp and seal of a registered professional engineer.

8. Catalog work sheets showing illustrated cuts of items may be submitted for standard manufactured items.
9. Include a copy of the installation superintendent's ETCP Certified Rigger - Theatre certification. A copy of the installation superintendent's ETCP certification shall be available on the job site for the length of the installation.

D. Any deviation from this Specification shall be clouded and noted in letters a minimum 1/4-inch high.
1. In order for a deviation to be considered, it must upgrade the quality of the equipment or respond to a field condition.

E. Provide Operation and Maintenance manuals upon completion of installation
1. One O&M manual shall be a printed hard copy.
2. O&M manual shall also be provided in electronic format on two flash drives
3. Manuals to include, but not limited to:
   a. Copies of all record shop drawings
   b. Parts lists
   c. Operational instruction,
   d. Service/maintenance recommendations
   e. Component working load limits

F. Rigging System Log Book:
1. At Owner training, furnish a system log book, configured to permit Owner tracking of inspections, system issues and maintenance history. Provide overview of observations and actions that should be documented for appropriate record keeping and compliance with industry standards for safety. Log book shall include:
   a. Schedule and ID of all installed rigging sets (manual and motorized).
   b. Identification of design parameters for each set, including high and low trim limits, set live loading capacity, hoist configuration settings, etc.
   c. Log sheet for periodic system-wide inspections, including commissioning date of system as first entry.
   d. Journal fields for each set to document date, status, observations, actions taken, and resolution.

1.5 CONTRACTOR RESPONSIBILITIES

A. Prepare and submit complete shop drawings according to the requirements set forth in the Contract Documents

B. Verify, by field measurement on the job site, all dimensions affecting the work.
1. Bring field dimensions which vary from those on the approved shop drawings to the attention of the Architect.
   a. If required, obtain a directive from the Architect and Owner regarding corrective measures before the start of fabrication of items affected by the variance.

C. Install equipment complete in all respects and provide any additional equipment required to fulfill the intent of the drawings and specifications regardless of whether or not such items are herein specified or indicated.

D. If requested by the Owner or Architect, provide satisfactory evidence as to the kind and quality of materials he proposes to furnish by submission of exact samples of hardware to be used in this contract.
1. The samples shall be retained by the Owner until such time that this contract has been completed and accepted

1.6 WARRANTY

A. The Contractor shall assure that the rigging is properly installed, free of defects in materials and workmanship and shall provide a warranty on all equipment and workmanship provided under this contract for a period of two (2) years from the date of the final acceptance.

B. During the warranty period, repair or replacement of defective materials and faulty workmanship shall be provided, at no cost to the Owner, within ten days of written notification of defects(s).

C. Post Installation Safety Inspection:
1. One year after the date of final acceptance by the Owner, the Stage Rigging Contractor Supervisor shall return to the job site to conduct a thorough inspection of the rigging installation.
   a. Check all bolts and tighten as required, inspect all cable connections and cables
   b. Give all items a thorough safety inspection in compliance with ANSI E1.47, Entertainment Technology – Recommended Guidelines for Entertainment Rigging System Inspections.
   c. Repair or replace all damaged items

d. If the original supervisor is unavailable either because the supervisor no longer works for the contractor or due to issues fully beyond the control of the contractor, then an alternate rigger superintendent shall perform the inspection, under the following conditions:
   1) The alternate superintendent shall be ETCP-RT certified.
   2) The alternate superintendent shall have experience supervising installation on projects of similar scope and scale.

2. The Contractor is responsible for all materials, superintendent labor, transportation and living expenses for this work at no additional cost to the Owner.
   a. Conduct inspection and repair work during normal working hours at a time mutually agreed upon by the Owner and the Contractor.
3. Provide the Owner and Architect with a written report stating the findings of the inspection within two weeks of completion of the inspection

PART 2 - PRODUCTS

2.1 STAGE RIGGING MANUFACTURERS

A. Pre-approved Stage Rigging Manufacturers for work of this section shall include:
1. Electronic Theatre Controls
   Austin, TX
   (512) 836-2242
   https://www.etcconnect.com/
2. J.R. Clancy Inc.
   Syracuse, NY
   (315)451-3440
   https://www.jrclancy.com/
3. Chicago Flyhouse
   Chicago, IL
   (773) 533-1590
   https://www.flyhouse.com/

2.2 STAGE RIGGING CONTRACTORS

A. The Contractor shall have been continuously engaged in the production of theatrical stage rigging equipment for at least fifteen years.

B. The Contractor shall have installed a total of not less than five installations of equal or greater scope to system specified herein, which have been in service for a minimum of one year and a maximum of ten years.
1. Each of the listed stage rigging installations shall be in service in fully professional commercial theatres being operated by professional technicians.

C. Stage Rigging Contractors for work of this section shall include:
1. Chicago Flyhouse
   Chicago, IL
   (773) 533-1590
   https://www.flyhouse.com/
2. Weiss Inc.
   Fairview, NJ
   (201) 402-6500
   https://www.iweiss.com/
3. J.R. Clancy Inc.
   Syracuse, NY
   (315)451-3440
   https://www.jrclancy.com/
4. Stage Rigging Services
   Greensboro, NC
   (336) 370-1900
   http://www.srsrigging.us/
5. Texas Scenic Co.
   San Antonio, TX
   (210) 684-0091
   https://www.texasscenic.com/
6. Protech Theatrical Services, Inc.

Las Vegas, NV
(702) 639-0290
www.protechlv.com

D. The Contractor for this section shall be the same Contractor that furnishes and installs the following related Division 11 theatrical systems specified on this project:
1. 116136 – Counterweight Rigging & Pin Rails
2. 116139 – Fire Safety Curtain
3. 116163 – Acoustic Equipment

2.3 MATERIALS

A. Ferrous materials and accessories shall conform to the following ASTM and ANSI standard specifications:
1. Standard structural steel shapes and plates:
a. ASTM A-36.
2. Miscellaneous steel items:
a. ASTM A-283, grade optional.
3. Steel pipe:
a. ASTM A-53
4. Gray iron castings:
a. ASTM A-48, Class 30 unless otherwise specified.
5. Malleable iron castings:
a. ASTM A-47
6. Bolts and nuts:
a. B18.2.1&2
7. Welding electrodes shall be as permitted by AWS Code D1.0.

B. Wire Rope and Fittings
1. Wire rope shall be 7x19 construction, utility cable, sized as required, that meets Federal Specification RR-W-410E.
a. Damaged or deformed cables shall not be used.
2. Use Nicopress copper sleeves or forged steel clips and conform to wire rope manufacturer's recommendations as to size, number and method of installation.

C. Aluminum Materials and Accessories
1. Thicknesses, gauges and tempers of aluminum products to meet structural standards.
2. Aluminum Castings: 214 or 356 alloy as per strength requirements.
3. Fasteners: Include bolts, nuts, washers, screws, nails, rivets and other fastenings necessary for proper erection and/or assembly of aluminum work.
4. Fabrication shall be by AWS certified welders.

D. Finishes for Items Without Factory Finish
1. Welds, burrs and rough surfaces on all interior ferrous metals shall be ground smooth and the completed assembly cleaned, and all metal surfaces shall be given a minimum one coat of finish paint.
2. No painted finish shall be required on aluminum finishes.
3. Match all exposed fastenings to color and finish of adjacent material.

2.4 SAFETY STANDARDS

A. In order to establish minimum standards of safety, the following factors shall be used:
1. Cables and fittings: 8:1 Safety Factor
2. Terminating hardware: 5:1, or not exceeding WLL, whichever is more restrictive.
3. Trim chain assembly: 5:1, or not exceeding WLL, whichever is more restrictive.
4. Batten clamps: 5:1, or not exceeding WLL, whichever is more restrictive.
5. Motors: 1.0 Service factor
6. Gearboxes: 1.25 Mechanical Strength Service Factor
7. Cable bending ratio: Sheave diameter is 30 times diameter of cable
8. Tread pressures: 500# for cast iron, 900# for Nylatron ,1000# for steel
9. Maximum fleet angle: 1-1/2 degrees
10. Steel: 1/5 of yield
11. Bearings: L10 life of 2000 hours at two times required load at full speed
12. Bolts: Grade 5 or better, plated

2.5 SIGNAGE

A. Provide and install signs with white background and 3/8 inches high red letters to be mounted on the wall on the stage level, fly gallery level, and loading bridge level at a position that is conspicuous to workers performing rigging work.
   1. The signs shall read as shown on the drawings.
   2. “Date of Last Inspection” and “Date of Next Required Inspection” information shall be in erasable marker.

2.6 MOTORIZED RIGGING ITEMS

A. Loft blocks:
   1. Underhung
   2. Sheave:
      a. 8-inch diameter
      b. Single cast or nylon
      c. Grooved to conform to rope and cable manufacturer's recommendations
      d. Machined, faced and bored for shaft and bearings
   3. Bearing:
      a. At least 2-inch diameter hub
      b. Two tapered roller bearings in place operating on a 1/2-inch diameter steel shaft or sealed precision ball bearings on a 5/8-inch diameter steel shaft
   4. Shaft:
      a. Keyed to one side plate to prevent the shaft from rotating
      b. Thread the opposite end of the shaft and equip with "Flexloc" self-locking nut
   5. Side Plates:
      a. Minimum of 11-gauge steel
   6. Install loft blocks at spacing as shown on drawings

B. Mule blocks:
   1. Meets the same specifications as the head blocks, except that sheave shall be 10 inches in diameter, provided with suitable universal joint swivel bases and mounting stands or bracket to meet the job conditions.

C. Idler blocks:
   1. Consists of one or more sheaves contained within an assembly to provide only vertical support of the lift lines
   2. Mount to loft blocks or from building structure

D. Tension blocks:
   1. Sheave:
      a. Cast iron or nylon
      b. 10-inch diameter
      c. Grooved for 3/4-inch rope
      d. Machined, faced and bored for shaft and bearings.
      e. Housing: one-piece gray iron casting
   2. Bearing:
      a. 1/2-inch diameter steel shaft threaded
      b. Two precision ball bearing or tapered roller bearing assemblies
      c. Held with a hex head nut
   3. Weight: at least 30 pounds
   4. Rides in tee bar by means of UHMW guide assembles with 1/4-inch steel back plates.
      a. Secure each guide assembly to the block housing by two 3/8-inch bolts, nuts and lock washers

E. Pipe Battens:
   1. 1-1/2-inch NPS, schedule 40 steel pipe
   2. Splices:
      a. Sleeve splice all joints
      b. 18 inches long, 9 inches extending into each pipe.
      c. Bolt through the sleeve with two 3/8 inches x 1-inch hex head, grade 5 bolts.
         1) Drill holes in pipes and sleeves so that all pipe sections are interchangeable
   3. Color: Black (painted)
      a. Paint the last 12 inches at each end of the truss and pipe batten white or provide yellow plastic end caps.

b. Mark centerline with a 1/2-inch painted yellow line around the circumference of the bottom pipe
c. Paint 1/2-inch-wide white lines at 1-foot increments marked around the circumference of the batten, starting at center and working out to the ends

4. At each pick-up point, provide a red tape mark on each side of the trim chain for the full circumference of the top pipe.
5. Line Set Numbers:
   a. Mark each batten with its line set number
   b. Color: white
   c. 1-inch-high numerals
   d. Mark on the top and bottom of each batten 18 inches from each end, and 12 inches stage left of the centerline mark
6. Use trim chains for pickup cable batten connections

F. Pipe Batten Extensions:
1. Ten pipe extensions.
2. Length: 6 feet
3. 1-inch NPS schedule 80 steel pipe
4. Must sleeve within the 1-1/2" I.D. pipe batten.
5. Terminate extensions in a pipe collar welded in place and ground smooth to act as an end stop
6. Paint extensions white from end – 4 feet
   a. Paint the last 2 feet bright red
7. Install extensions on linesets designated by the Owner's representative

G. Pickup Cables:
1. Use 3/16-inch 7 x 19 utility cable
2. Breaking Strength: 7,000 lbs.
3. free of oil
4. Certification required.

H. Trim Chains:
1. Use either J.R. Clancy Grade 63 AlphaChain or SECOA STC chain
   a. 3,250 pounds working load
   b. Must meet OSHA 1910.184(e)(5) – Sling use,
   c. Length: 36 inches
   d. Use at the batten end of the pickup cables.
2. One end of the trim chain shall connect to pickup cable with thimbles and Nico-press sleeves.
3. Fit the other end with a 1/4-inch screw-pin shackle

I. Alternative batten clamp Trim Chains:
1. Assemble trim chain with 1/4-inch screw-pin shackle, steel batten clamp and either J.R. Clancy Grade 63 AlphaChain or SECOA STC chain,
2. 3,250 pounds working load
3. Must meet OSHA 1910.184(e)(5) – Sling use.

J. Wall Battens:
1. Use the same angle iron as the upper and lower stop bumpers
2. Mount on 5-foot centers
3. Weld wall battens in place to tilt wall imbeds provided by the General Contractor
4. Fasten tee bars and hold parallel using "U" shaped clips at each wall batten

2.7 FIXED-SPEED HIGH-CAPACITY HOISTS WITH CABLE MANAGEMENT

A. Provide four motorized stage lighting hoists as shown on the drawings.
1. Basis of Design:
   a. ETC Prodigy EXO 2000 with hoist-operated lift line and cable cradle style cable management.
   b. Contractor may propose alternative hoist motor/drum types and layouts to review by Architect
   c. J.R. Clancy PowerLift with cable management system is an acceptable alternate
   d. If Contractor substitutes another manufacturer for the basis of design, then Contractor assumes responsibility for cost of any and all additional steel, wiring, and other hardware required as a result of this substitution.
      1) Line shaft hoists will not be approved.

B. Provide three motorized acoustic ceiling hoists as shown on the drawings.
   a. ETC Prodigy P75
   b. Contractor may propose alternative hoist motor/drum types and layouts to review by Architect

c. J.R. Clancy PowerLift with cable management system is an acceptable alternate
d. If Contractor substitutes another manufacturer for the basis of design, then Contractor assumes responsibility for cost of any and all additional steel, wiring, and other hardware required as a result of this substitution.
1) Line shaft hoists will not be approved.

C. Manufacturer shall be responsible for steel, hardware, etc. required to provide means of attachment of the motorized stage lighting batten sets to building structure.

D. Each motorized set includes:
1. Lifting Speed: 20-30 feet per minute
2. Capacity: Per schedule
3. Travel as shown on drawings
4. Drum
5. Motor
6. Reducer
7. Limit switches
8. Overload sensors
9. Slack line detection sensors
10. Encoder
11. Loft Blocks
12. 3/16-inch 7x19 utility lift cables
13. Single-pipe batten in lengths shown on drawings

E. Motorized Drum Hoist Components
1. Drum Construction:
a. Winding
b. Grooved to accept a single layer of 3/16-inch cable
c. Minimum pitch diameter: 28 times the cable diameter
d. Unitized welded construction
e. Cable Termination:
1) Drill holes at the root of the cable groove through the tubing wall
2) Angle hole 45 degrees off of the radial line to avoid a sharp bend in the cable
f. Mounting:
1) Direct mount and key to the output shaft of the reducer
2) Support outboard end by self-aligning flange bearing
2. Motor:
a. 480 volt
1) Coordinate with electrical contractor
2) Verify in shop drawings
b. AGMA service factor: minimum 1.0 for continuous operation
c. Gearing service factor: minimum 1.0
d. Mechanical strength factor: 1.3.
3. Reducer:
a. Direct coupled
b. Oil bath
c. Combination helical/worm reducer with an integral motor and brake.
d. Cast iron gear case for protection against shock damage and protect shafts with double lip oil seals to prevent leaks.
e. Double reduction gear train with the helical gearing before the worm gears for higher torque transmission
4. Primary Brake:
a. Direct acting AC or DC electro-magnetic
b. Contains a manual release
c. Minimum retarding torque equal to 200% of motor full load torque.
d. Release the brake by energizing the coil simultaneously with the motor winding to provide fail safe braking in the event of power failure
5. Secondary Brake:
a. Overspeed brake
b. Failsafe meant to stop and hold the load in case of drive train failure
c. Can be power released after being applied during or after regular stopping as normal operational sequence.
d. If brake is applied, default to an intentional release

e. Stage Rigging Contractor may propose alternative methods of secondary braking.

6. Limit Switches:
   a. Provide four switches
      1) Two over-travel switches
      2) Two position or end-of-travel switches
   b. Mechanical assembly
   c. Independently adjustable switch/cam sets
   d. Mount to the hoist base in a manner that allows for easy adjustment of the switch settings.
   e. Fully guarded input shaft and drive chain
   f. Pin sprockets to the shafts to prevent erroneous feedback and size to allow maximum usable rotation of the limit switch cam.
7. Encoder:
   a. Solid state optical encoder for position feedback

F. Provide mounting steel as required

G. Single Pipe Battens:
1. 1-1/2-inch NPS schedule 40 pipe batten with sleeve splice
2. Color: Black (painted)
3. Attach yellow plastic end caps to each end of the battens
4. Mark battens per detail in Contract Drawings

H. Provide cable management devices with connector strip power and Ethernet conductors.
1. Cable management devices shall be located as shown on drawings.
2. Cable management devices shall provide permanent electrical connection for the stage lighting dimming circuits.
3. Provide Cable management devices in stage lighting circuit quantities as shown on the drawings.
4. Cable management devices shall include Cat6 cable management for stage lighting dimming system low voltage Ethernet control network.

2.8 STAGE RIGGING CONTROL PANEL:

A. Basis of design:
1. ETC Quick Touch+ MK2 12 Channel
2. Contractor may propose alternative control panels subject to review by Architect.
3. If Contractor substitutes another manufacturer for the basis of design, then Contractor assumes responsibility for cost of any and all additional steel, wiring, and other hardware required as a result of this substitution.

B. General:
1. Wall-mount style controller

C. Control Interface:
1. Provide operator control panel that features “Go Up”, “Go Down”, and “Go Target” pushbuttons
2. Shall have integral emergency stop button

D. Recorded Cues and Presets:
1. An operator recording cues and presets may specify:
   a. Target position
      1) A specific target position, a relative move (e.g. go out 10 feet), or a match to a present or previous position.
   b. Acceleration
      1) A set specific rate or a default value
   c. Speed
      1) A velocity, a percentage of full speed, or a travel time. Default values also supported.
   d. Deceleration
      1) A set specific rate or a default value
   e. Number of hoists controlled
      1) each with its own speed and target
   f. Synchronized Groups
   g. Cue and preset names and labeling

E. Safety Requirements:
1. Movement is only initiated by hold to run (deadman) hardware pushbuttons or joysticks
2. A console-controlled limit function
   a. To allow the operator to set “soft” upper, lower and preset limits for each encoder-equipped hoist.

3. Where the load monitoring option is specified, the control system shall be capable of “learning” the load characteristics and monitoring load changes. The load monitoring system shall accommodate change to the suspended weight of electric cables and other predictable variables, without false tripping.
4. Password-protected for “Access” “Edit” and “System” levels of operation at a minimum.
   a. Additional user levels shall be password-protected and created as directed by Owner.
5. Height and distance data may be entered as feet and inches, decimal feet, or 100% metric as directed by the Owner.
6. A mushroom head "EMERGENCY STOP" button wired to a failsafe circuit that conforms to NPFA 79 requirements shall be provided.
7. An "ON/OFF" key operated switch shall be provided that removes power to the console, motor starters and drives. Any control system that requires motors and drives energized while the system is not in use is not acceptable.

2.9 SIGNAGE

A. Provide and install signs with white background and 3/8-inch-high red letters to be mounted on the wall adjacent to the tee bar battery on the stage level, fly gallery level, and loading bridge level.
   1. The signs shall read as shown on the drawings.
   2. “Date of Last Inspection” and “Date of Next Required Inspection” information shall be in erasable marker.

B. Provide numbered labels to identify each line set at loading bridge level, either on the face of the kickplate, on the head block beam or suspended below the head block beam.

2.10 RIGGING OF ELECTRICAL MULTICABLES

A. Rig stage lighting circuit multicable extensions from theatrical lighting system connector strips mounted on stage pipe battens.

B. Refer both rigging drawings and theatrical lighting drawings for specific details regarding cable lengths and locations

PART 3 - EXECUTION

3.1 GENERAL

A. Examine all conditions under which all presentation area rigging items shall be installed and notify the General Contractor in writing of any condition detrimental to the proper and timely completion of the work.

B. Contractor is solely and exclusively responsible for the satisfactory completion of this rigging system
   1. Supply all tools required for the successful installation of the equipment herein.
   2. Storage of all equipment and tools during the period of installation and for collecting and removing from the job site all packing materials, trash, scrap materials, etc.

C. The Contractor shall be responsible for the protection of equipment and/or finished materials provided by other Contractors.

D. Prior to the completion of the installation, the Contractor shall notify the General Contractor and Architect to schedule an inspection of the system.
   1. At the time of the inspection, the Contractor shall furnish sufficient personnel to operate all equipment and to perform adjustments and tests as may be required by the Architect and/or the Owner's representatives.
   2. Repair or replace equipment that does not meet specifications with new equipment
      a. Reschedule inspection under the same conditions listed previously
   3. Remove all temporary to permit full operation and access to all equipment.
   4. Final review will be withheld until all systems have been thoroughly tested and found to be in first class operating condition in every circumstance.

3.2 INSTALLATION SUPERVISION

A. Installation of the rigging systems shall be supervised by the Contractor's own experienced superintendent having extensive experience in installing work of this kind.
   1. Superintendent shall be an Entertainment Technician Certification Program (ETCP) Certified Rigger - Theatre.

a. Rigging System Contractor shall provide the Architect with a copy of the superintendent's ETCP certification and shall make a copy of this certification available on the job site for the length of the installation.

2. An ETCP Certified Rigger - Theatre shall be present at all times during the rigging system installation.

B. The same individual shall remain in charge of the work throughout the installation of the rigging system until work is completed excepting only the intervention of circumstances completely beyond the control of the Contractor.

C. The superintendent shall represent the Contractor and all directions given to him shall be binding as if given to the Contractor.
1. The Contractor may require the Owner to confirm such directions in writing.

3.3 FIELD QUALITY CONTROL

A. Install rigging system in accordance with OSHA Safety and Health Standards and all local codes. All welding shall be in full compliance with the most recent edition of the Structural Welding Code (ANSI / AWS D1.1).

B. Install all equipment in locations shown on Construction Drawings
1. Install plumb, straight and true and function as designed.

C. Install all components to prevent abrasion of moving items against any part of the building structure or other equipment.
1. Align sheaves as to provide fleet angles of the cables not exceeding two (2) degrees.
2. Provide mule blocks, cable rollers and guides as required to provide proper alignment and movement around obstructions.

D. Form cable termination eyes over thimbles of correct size

E. The Contractor shall perform all drilling and fitting required in the setting of materials and all cutting and fitting required in the fitting of materials to the adjoining work of other Contractors.

3.4 OWNER TRAINING

A. Contractor's installation superintendent shall perform owner training

B. Schedule instruction with the Owner's designated representatives.

C. Provide all O&M materials, as designated in this Specification, at the time of training

D. Instruction shall be independent of the system check-out and activation. Length of engineering check-out and activation shall not affect the length of instruction time.
1. Instruction shall not necessarily follow immediately after the system check-out and activation

E. Provide up to four hours of owner training to include the following:
1. Up to two hours of instruction shall cover the safe and proper operation of the equipment, including limit switch placement and adjustment, use of the control panel, etc., to the Owner's designated representative.
2. An additional two hours of training shall be dedicated to walking up to six users through an ANSI inspection of one lineset of each type.
a. ANSI inspection training shall cover what to look and listen for, how to identify common problems in each rigging system, and when a problem needs to be addressed immediately by a professional rigger.

F. Instruction, at Owner's digression, may occur in multiple time blocks.
1. If training is non-continuous, provide one form for each training segment.

G. Provide written documentation of Owner training to the Owner upon completion.
1. Form to include:
a. The date, time, and location of training.
b. Name, title, company and signature of trainer.
c. Name, title, and signature of all participants.
d. Topics covered at training.

H. Training may be video and audio recorded by the owner at the owner's expense.

END OF SECTION 11 61 33

SECTION 11 61 36

COUNTERWEIGHT RIGGING & PIN RAILS

PART 1 - GENERAL

1.1 WORK OF THIS SECTION

A. This Section includes all labor, materials, equipment, and services necessary to furnish and install the Stage Rigging System as shown on the QT drawings and/or specified herein, including but not limited to the following:
   1. 22 fully rigged, six-line, single purchase counterweight line sets and associated equipment.
   2. Mule blocks, idler sheaves, cable rollers or guides as required assuring proper alignment and operation of the rigging system.
   3. Index strip lights and scenery outrigger pipes
   4. Fly Gallery pin rails
   5. Loading bridge post and chain guard railings
   6. Miscellaneous equipment listed herein, for installation by others

B. Related work in other sections:
   1. 116133 – Motorized Rigging
   2. 116123 – Theatrical and Acoustic Drapery and Track
   3. 116113 – Networked Lighting Control
   4. 116116 – Wiring Devices
   5. 116119 – Stage Lighting Fixtures

1.2 SUBSITITUTIONS

A. Substitutions are allowed when the substitution improves the quality, decrease installation time, or reduce cost.
   1. Submit a proposal that clearly outlines construction features of the product so that true and accurate comparisons may be made.
      a. Samples of the proposed substation item/s may be requested by the Architect and/or Owner for evaluation

B. No product bid which deviates from the details of the Construction Documents will be considered unless such deviation has been approved in advance by the Architect.

1.3 PROJECT CONDITIONS

A. Provide all new equipment of the latest design

B. No extras will be allowed due to the Contractor's misunderstanding of the work involved or its lack of knowledge of any field conditions due to failure to make accurate field measurements or a thorough investigation of the job site

1.4 SUBMITTALS

A. Stage Rigging Contractor shall prepare and submit complete shop drawings according to the requirements set forth in the Contract Documents

B. Submit shop drawings for review by the Architect before fabrication can begin. Such review does not relieve the Contractor of the responsibility of providing equipment in accordance with this Specification.

C. Shop Drawings:
   1. Show dimensions, sizes, gauges, thicknesses, finishes, joining, attachments and relationship of work to adjoining construction.
   2. Clearly show power, wire, and conduit requirements for all work to be provided by the Contractor.
   3. Where items must fit and coordinate with finished surfaces and/or constructed spaces, take measurements at site and not from drawings.
   4. Where other materials must be set to exact locations to receive rigging, furnish assistance and directions necessary to permit other trades to locate their work.
   5. Where welded connections, concrete or masonry inserts are required to receive work, show exact locations required and all such drawings shall be furnished to the trades responsible for installing the connectors or inserts.

6. Show locations of all lubrication points.
7. Include engineering and load calculations as well as stamp and seal of a registered professional engineer.
8. Catalog work sheets showing illustrated cuts of items may be submitted for standard manufactured items.
9. Include a copy of the installation superintendent's ETCP Certified Rigger - Theatre certification. A copy of the installation superintendent's ETCP certification shall be available on the job site for the length of the installation.

D. Any deviation from this Specification shall be clouded and noted in letters a minimum 1/4-inch high.
1. In order for a deviation to be considered, it must upgrade the quality of the equipment or respond to a field condition.

E. Provide Operation and Maintenance manuals upon completion of installation
1. One O&M manual shall be a printed hard copy.
2. O&M manual shall also be provided in electronic format on two flash drives
3. Manuals to include, but not limited to:
   a. Copies of all record shop drawings
   b. Parts lists
   c. Operational instruction,
   d. Service/maintenance recommendations
   e. Component working load limits

1.5 CONTRACTOR RESPONSIBILITIES

A. Prepare and submit complete shop drawings according to the requirements set forth in the Contract Documents

B. Verify, by field measurement on the job site, all dimensions affecting the work.
1. Bring field dimensions which vary from those on the approved shop drawings to the attention of the Architect.
   a. If required, obtain a directive from the Architect and Owner regarding corrective measures before the start of fabrication of items affected by the variance.

C. Install equipment complete in all respects and provide any additional equipment required to fulfill the intent of the drawings and specifications regardless of whether or not such items are herein specified or indicated.

D. If requested by the Owner or Architect, provide satisfactory evidence as to the kind and quality of materials he proposes to furnish by submission of exact samples of hardware to be used in this contract.
1. The samples shall be retained by the Owner until such time that this contract has been completed and accepted

1.6 WARRANTY

A. The Contractor shall assure that the rigging is properly installed, free of defects in materials and workmanship and shall provide a warranty on all equipment and workmanship provided under this contract for a period of two years from the date of the final acceptance.

B. During the warranty period, repair or replacement of defective materials and faulty workmanship shall be provided, at no cost to the Owner, within ten days of written notification of defects(s).

C. Post Installation Safety Inspection:
1. One year after the date of final acceptance by the Owner, the Stage Rigging Contractor Supervisor shall return to the job site to conduct a thorough inspection of the rigging installation.
   a. All bolts shall be checked and tightened as required, cables and all cable connections inspected and all items given a thorough safety inspection in compliance with ANSI E1.47, Entertainment Technology – Recommended Guidelines for Entertainment Rigging System Inspections.
   b. All damage not caused by negligence on the part of the Owner shall be repaired and/or replaced.
   c. If the original supervisor is unavailable either because the supervisor no longer works for the contractor or due to issues fully beyond the control of the contractor, then an alternate rigger superintendent shall perform the inspection, under the following conditions:
      1) The alternate superintendent shall be ETCP-RT certified.
      2) The alternate superintendent shall have experience supervising installation on projects of similar scope and scale.

2. All materials, superintendent labor, transportation and living expenses for this work shall be furnished by the Stage Rigging Contractor at no additional cost to the Owner.
   a. The inspection and repair work shall be conducted during normal working hours at a time mutually agreed upon by the Owner and the Stage Rigging Contractor.
3. Within two weeks of the completion of the inspection, the Stage Rigging Contractor shall provide the Owner and Architect with a written report stating the findings of the inspection.

PART 2 - PRODUCTS

2.1 STAGE RIGGING MANUFACTURERS

A. Pre-approved Stage Rigging Manufacturers for work of this section shall include:
1. Weiss Inc.
   Fairview, NJ
   (201) 402-6500
   https://www.iweiss.com/
2. J.R. Clancy Inc.
   Syracuse, NY
   (315)451-3440
   https://www.jrclancy.com/
3. Texas Scenic Co.
   San Antonio, TX
   (210) 684-0091
   https://www.texasscenic.com/
4. Protech Theatrical Services, Inc.
   Las Vegas NV 89030
   (702) 639-0290
   www.protechlv.com

2.2 RIGGING CONTRACTORS

A. The Stage Rigging Contractor shall have been continuously engaged in the production of theatrical stage rigging equipment for at least fifteen years.

B. The Stage Rigging Contractor shall have installed a total of not less than five installations of equal or greater scope to system specified herein, which have been in service for a minimum of one year and a maximum of ten years.
1. Each of the listed stage rigging installations shall be in service in fully professional commercial theatres being operated by professional technicians.

C. Pre-approved Stage Rigging Contractors for work of this section shall include:
1. Chicago Flyhouse
   Chicago, IL
   (773) 533-1590
   https://www.flyhouse.com/
2. Weiss
   Fairview, NJ
   (201) 402-6500
   https://www.iweiss.com/
3. J.R. Clancy Inc.
   Syracuse, NY
   (315)451-3440
   https://www.jrclancy.com/
4. Texas Scenic
   San Antonio, TX
   (210) 684-0091
   https://www.texasscenic.com/

D. The Contractor for this section shall be the same Contractor that furnishes and installs the following related Division 11 theatrical systems specified on this project:
1. 116133 – Motorized Rigging
2. 116136 – Counterweight Rigging
3. 116139 – Fire Safety Curtain

4. 116163 – Acoustic Equipment

2.3 MATERIALS

A. Ferrous materials and accessories shall conform to the following ASTM and ANSI standard specifications:
1. Standard structural steel shapes and plates:
   a. ASTM A-36.
2. Miscellaneous steel items:
   a. ASTM A-283, grade optional.
3. Steel pipe:
   a. ASTM A-120
4. Gray iron castings:
   a. ASTM A-48, Class 30 unless otherwise specified.
5. Malleable iron castings:
   a. ASTM A-47
6. Bolts and nuts:
   a. B18.2.1&2
7. Welding electrodes shall be as permitted by AWS Code D1.0.

B. Wire Rope and Fittings
1. Wire rope shall be 7x19 construction, utility cable, sized as required, that meets Federal Specification RR-W-410E.
   a. Damaged or deformed cables shall not be used.
2. Use Nicopress copper sleeves or forged steel clips and conform to wire rope manufacturer's recommendations as to size, number and method of installation.

C. Aluminum Materials and Accessories
1. Thicknesses, gauges and tempers of aluminum products to meet structural standards.
2. Aluminum Castings: 214 or 356 alloy as per strength requirements.
3. Fasteners: Include bolts, nuts, washers, screws, nails, rivets and other fastenings necessary for proper erection and/or assembly of aluminum work.
4. Fabrication shall be by AWS certified welders.

D. Finishes for Items Without Factory Finish
1. Welds, burrs and rough surfaces on all interior ferrous metals shall be ground smooth and the completed assembly cleaned and all metal surfaces shall be given a minimum one coat of finish paint.
2. No painted finish shall be required on aluminum finishes.
3. Match all exposed fastenings to color and finish of adjacent material.

2.4 SAFETY STANDARDS

A. In order to establish minimum standards of safety, the following factors shall be used:
1. Cables and fittings: 8:1 Safety Factor
2. Terminating hardware: 5:1, or not exceeding WLL, whichever is more restrictive.
3. Purchase lines: Min. tensile strength of 4,860# when new.
4. Trim chain assembly: 5:1, or not exceeding WLL, whichever is more restrictive.
5. Batten clamps: 5:1, or not exceeding WLL, whichever is more restrictive.
6. Fiber rope lifting lines: 10:1, min. 5/8” diameter.
7. Motors: 1.0 Service factor
8. Gearboxes: 1.25 Mechanical Strength Service Factor
9. Cable bending ratio: Sheave diameter is 30 times diameter of cable
10. Tread pressures: 500# for cast iron, 900# for Nylatron ,1000# for steel
11. Maximum fleet angle: 1-1/2 degrees
12. Steel: 1/5 of yield
13. Bearings: L10 life of 2000 hours at two times required load at full speed
14. Bolts: Grade 5 or better, plated

2.5 GENERAL PURPOSE SINGLE-PURCHASE COUNTERWEIGHT RIGGING

A. The general-purpose stage rigging system shall be single purchase, tee-bar guided line sets. Each set shall include the following:
1. One upright 12-inch head block, with sheave grooved for six cables and one rope.
2. Six 8-inch underhung/upright loft blocks, each grooved for one cable.
3. One counterweight arbor with 1800 lbs. load capacity.

4. One safety rope lock at stage level locking rail
5. One 3/4-inch Multiline II or SureGrip synthetic rope purchase line.
6. One tension block.
7. Six 1/4-inch 7 x 19 galvanized aircraft cables, fitted with trim chains, screw-pin shackles, safety bolt, wire rope thimbles, and swage fittings.
8. One 60'-0" pipe batten, as shown on drawings, of 1-1/2-inch NPS, schedule 40 steel pipe with internal splices, line set numbers at each end.
9. For each line set, provide 1200 lbs. of steel counterweight per set, 80% at 2 inches thick, and 20% at 1 inch thick
    a. Distribute 95% of the counterweight along the loading bridge and 5% along the stage fly gallery.

2.6 SINGLE PURCHASE COUNTERWEIGHT RIGGING ITEMS

A. Head blocks:
1. Underhung
2. Equip at least six pipe spacers, through bolted to the side plates, to prevent cables escaping from the sheave grooves.
3. Sheave:
    a. 12-inch diameter
    b. Grooved to conform to rope and cable manufacturer's recommendations.
    c. Single cast or nylon sheave shall be
    d. Machined, faced, lathe turned and grooved for the respective number of 1/4-inch cables and one 3/4-inch rope.
4. Bearing:
    a. At least 1-inch diameter hub
    b. Tapered roller bearings with felt seals press fitted in the head block bore.
5. Shaft:
    a. Keyed to one side plate or otherwise restrained to prevent rotation.
    b. Proper adjustment of the bearings to be accomplished by "Flexloc" self-locking nut on the opposite side of the shaft.
6. Side plates:
    a. At least 10-gauge steel
    b. Weld each side plate to the base angle
7. Mounting Angle Iron:
    a. Two support angles for each head block for mounting to building structure
        1) Sized to support the specified loads
    b. Minimum of two bolts per base angle or mounting clips of sufficient size.
8. Aligned so that each groove, its center and sides, remain in the same vertical axis when the sheave is rotated.
9. Provide additional support steel to elevate the head block as required.

B. Loft blocks:
1. **U**nderhung
2. Sheave:
    a. 8-inch diameter
    b. Single cast or nylon
    c. Grooved to conform to rope and cable manufacturer's recommendations
    d. Machined, faced and bored for shaft and bearings
3. Bearing:
    a. At least 2-inch diameter hub
    b. Two tapered roller bearings in place operating on a 1/2-inch diameter steel shaft or sealed precision ball bearings on a 5/8-inch diameter steel shaft
4. Shaft:
    a. Keyed to one side plate to prevent the shaft from rotating
    b. Thread the opposite end of the shaft and equip with "Flexloc" self-locking nut
5. Side Plates:
    a. Minimum of 11-gauge steel
6. Install loft blocks at spacing as shown on drawings

C. Mule blocks:

1. Meets the same specifications as the head blocks, except that sheave shall be 10 inches in diameter, provided with suitable universal joint swivel bases and mounting stands or bracket to meet the job conditions.

D. Idler blocks:
1. Consists of one or more sheaves contained within an assembly to provide only vertical support of the lift lines
2. Mount to loft blocks or from building structure

E. Tension blocks:
1. Sheave:
   a. Cast iron or nylon
   b. 10-inch diameter
   c. Grooved for 3/4-inch rope
   d. Machined, faced and bored for shaft and bearings.
   e. Housing: one-piece gray iron casting
2. Bearing:
   a. 1/2-inch diameter steel shaft threaded
   b. Two precision ball bearing or tapered roller bearing assemblies
   c. Held with a hex head nut
3. Weight: at least 30 pounds
4. Rides in tee bar by means of UHMW guide assembles with 1/4-inch steel back plates.
   a. Secure each guide assembly to the block housing by two 3/8-inch bolts, nuts and lock washers

F. Single-Purchase Counterweight Arbors:
1. Loading capacity: 1800
   a. Leave an additional 10-inch clear space above a full load of weights for easy loading.
2. Arbor Head construction:
   a. 5/16-inch-thick steel plates or 1/4-inch steel plate
   b. Form into a channel with 3-inch sides
      1) Two vertical side legs and one vertical end leg.
      2) Weld leg joints
   c. Provide side legs with smooth holes to receive anchor shackles.
3. Connect lead cable from battens to shackles with thimbles and Nico-Press sleeves or two wire rope clips
   a. Dress tail of cable with tape
4. Arbor Bottom construction:
   a. Similar construction as arbor tops or of 3-inch 7.1#C ship channel or of flat bar 1/2 x 3 inches bent to join with 3/8 x 3-inch vertical flat tie bar.
5. Provide head and bottom members with 7/16-inch drop forged eye bolts welded in the center to receive 3/4-inch purchase line.
   a. Connect purchase line to forged eye with thimble and knot
      1) Dress tail with tape.
6. Provide a minimum of two UHMW plastic guide assemblies
7. Connect top and bottom together by two 3/4-inch diameter vertical ASTM A36 steel bars threaded at their ends only.
   a. At the top of the arbor, provide the rods with two nuts on top of head and one nut at bottom of head
   b. Tap the bottom plate holes to receive 3/4-inch threaded rods. Provide one 3/4-inch full nut below the bottom member.
   c. No nuts are acceptable on tops of arbor bottoms except when ship channel is used.
   d. Provide one thumb screw on each rod clamping collar for locking weights in place
   e. Provide at the bottom end of the onstage 3/4-inch rod, a 1/2-inch drop forged eye nut to be equal to Chicago Hardware No. C-181-A, tapped to fit 3/4-inch rod.
8. Spreader plates:
   a. Minimum three per arbor
   b. 1/8-inch x 2-inch flat bar steel
   c. Affix signs to the arbor back plate that reads:
   d. “CAUTION: Locate spreader plate here.” at 2-foot intervals
9. At the top and bottom of each arbor, provide 1/2 inches high line set ID numbers. Adhesive "stick-on" number labels may be used

G. Pipe Battens:

1. 1-1/2-inch NPS, schedule 40 steel pipe
2. Splices:
   a. Sleeve splice all joints
   b. 18-inch long, 9 inches extending into each pipe.
   c. Bolt through the sleeve with two 3/8 inches x 1-inch hex head, grade 5 bolts.
      1) Drill holes in pipes and sleeves so that all pipe sections are interchangeable
3. Color: Black (painted)
   a. Paint the last 12 inches at each end of the truss and pipe batten white or provide yellow plastic end caps.
   b. Mark centerline with a 1/2-inch painted yellow line around the circumference of the bottom pipe
   c. Paint 1/2-inch-wide white lines at 1-foot increments marked around the circumference of the batten, starting at center and working out to the ends
4. At each pick-up point, provide a red tape mark on each side of the trim chain for the full circumference of the top pipe.
5. Line Set Numbers:
   a. Mark each batten with its line set number
   b. Color: white
   c. 1-inch-high numerals
   d. Mark on the top and bottom of each batten 18 inches from each end, and 12 inches stage left of the centerline mark
6. Use trim chains for pickup cable batten connections

H. Pipe Batten Extensions:
1. Ten pipe extensions.
2. Length: 6 feet
3. 1-inch NPS schedule 80 steel pipe
4. Must sleeve within the 1-1/2" I.D. pipe batten.
5. Terminate extensions in a pipe collar welded in place and ground smooth to act as an end stop
6. Paint extensions white from end – 4 feet
   a. Paint the last 2 feet bright red
7. Install extensions on line sets designated by the Owner's representative

I. Pickup Cables:
1. Use 1/4-inch 7 x 19 utility cable
2. Breaking Strength: 7,000 lbs.
3. free of oil
4. Certification required.

J. Trim Chains:
1. Use either J.R. Clancy Grade 63 AlphaChain or SECOA STC chain
   a. 3,250 pounds working load
   b. Must meet OSHA 1910.184(e)(5) – Sling use,
   c. Length: 36 inches
   d. Use at the batten end of the pickup cables.
2. One end of the trim chain shall connect to pickup cable with thimbles and Nico-press sleeves.
3. Fit the other end with a 1/4-inch screw-pin shackle

K. Alternative batten clamp Trim Chains:
1. Assemble trim chain with 1/4-inch screw-pin shackle, steel batten clamp and either J.R. Clancy Grade 63 AlphaChain or SECOA STC chain,
2. 3,250 pounds working load
3. Must meet OSHA 1910.184(e)(5) – Sling use.

L. Purchase Lines:
1. 3/4-inch diameter rope
2. Multiline II synthetic rope free from slivers and foreign materials and in one continuous length.
3. No splices will be accepted

M. Counterweights:
1. Standard "U" slotted type flame cut steel,
2. Width: 6 inches
3. Grind all edges smooth
4. Cut two opposite corners at 45-degree angle to allow for ease of removal with alternately stacked counterweights.

5. Insert sufficient weight in each arbor to balance the empty pipe and paint the exposed edges of these weights "safety yellow".

N. Arbor Guide Tracks:
1. Use 1-1/2 inches x 1-1/2 inches x 3/16 inches tee-steel or J-bar aluminum extending from the stage level to the underside of the head block beams.
2. Space tracks as shown on centers.

O. Stop Bumpers:
1. Use 1-3/4 inches x 1-3/4 inches x 3/16 inches angle irons bolted to the tee tracks.
2. Bolt 2-inch x 2-inch hardwood to the angle iron.
3. On the arbor contact surface of the hardwood, mount 1/2-inch neoprene rubber to cushion the arbor impact.

P. Wall Battens:
1. Use the same angle iron as the upper and lower stop bumpers
2. Mount on 5-foot centers
3. Weld wall battens in place to tilt wall imbeds provided by the General Contractor
4. Fasten tee bars and hold parallel using "U" shaped clips at each wall batten

Q. J-Bar Connections:
1. All connections of wall knees, wall battens, stop battens, and tee guides shall have 3/4-inch slotted holes to permit perfect vertical alignment.
2. Use 5/16-inch x 7/8-inch machine bolts for all tee connections.
   a. For all other connections, use 3/8-inch x 1-1/4-inch bolts
3. Use a flat washer and a lock nut at all slotted connections
   a. Use lock washers at all other connections

R. Locking Rails:
1. Location: at the stage floor level and at the fly gallery level
2. Construction:
   a. Drill to receive rope locks 8 inches on center
   b. Use 3 inches x 4 inches x 1/4-inch steel angle for the rope lock
      1) Supported 2-foot 6-inches above the stage floor by C4 x 7.24 steel channel legs with diagonal bracing.
   c. Base plates on each leg for floor mounting and gussets for rigidity.
3. Bolt leg base plates through the floor slab or weld to structural steel for maximum uplift of 400 pounds per linear foot on the purchase lines through the rope locks.
4. On each locking rail, provide cards and mountings for further identification of line sets
5. Provide permanent line set number labels on the locking rail above the ID card slots
   a. Do not place these lineset number labels in the line set identification cards

S. Rope Locks:
1. Construction:
   a. Housings made out of a material having ductile properties that will deform plastically without fracturing
   b. Provide an adjustment mechanism on the rope lock for adjustment of the clamping members for worm ropes or ropes of differing diameters
   c. Encapsulate handle in plastic
   d. 50 pounds capacity
   e. Contains an integral mechanism designed to prevent accidental release
2. Operation:
   a. Holds locked position until manually released
3. Position Rope Locks to impose minimal wear on the operating line as it passes through the system.

2.7 INDEX STRIPLIGHTS AND SUPPORT OUTRIGGERS

A. Provide three sets of two circuit LED index striplights in lengths shown on the drawings and suspended on chains above the stage level locking rail
1. Provide sufficient chain to allow potential lowering of each striplight 2 feet.
2. Wire lamps on two circuits,
   a. One for a blue-wash
   b. One for a white-wash.
3. Provide LED lamps, in blue and warm-white.

B. Provide an outrigger assembly as shown on the drawings to support the index strip lights.

2.8 SINGLE PIN RAILS

A. Furnish single pin rails in type and lengths shown on the drawings in locations shown on drawings

B. Construction:
1. 3 1/2-inch I.D. steel pipe
2. Contains holes for removable steel belaying pins located every 12 inches on center on each rail.
3. Designed to accept either a maximum anticipated load of 500# PLF or a point load of 1000# PLF in either an upward or downward direction, at the midpoint between each pin rail support.

C. Provide 48 belaying pins, each 20 inches long.
1. Install 24 pins stage right and 24 pins stage left

2.9 LOADING BRIDGE POST AND CHAIN ARBOR GUARD RAILINGS

A. Provide pipe or square tube posts to the loading bridge as shown on the drawings.

B. Provide rails at +30 inches and +42 inches AFF of 4/0 proof coil chain extending from post to post along the entire length of the arbor side of the loading bridge.
1. One end of each length of chain shall be permanently attached to one post, and the opposite end of the chain shall have a 3/8-inch jaw and jaw turnbuckle and screw pin shackle.
a. Tape all cotter pins to eliminate all sharp edges

C. Tension each chain rail to eliminate swag

D. Withstand a force of minimum 200# in any direction

2.10 SIGNAGE

A. Provide and install signs with white background and 3/8-inch-high red letters to be mounted on the wall adjacent to the tee bar battery on the stage level, fly gallery level, and loading bridge level.
1. The signs shall read as shown on the drawings.
2. “Date of Last Inspection” and “Date of Next Required Inspection” information shall be in erasable marker.

B. Provide numbered labels to identify each line set at loading bridge level, either on the face of the kickplate, on the head block beam or suspended below the head block beam.

2.11 MISCELLANEOUS EQUIPMENT

A. Provide the following equipment, stored at grid iron level:
1. Eight 8-inch diameter upright head blocks
a. Meet the same requirements as the head blocks listed in above with two sheaves, each grooved for one 5/8-inch diameter rope line.
2. Eight 8-inch diameter upright loft blocks
a. Meet the same requirements as the loft blocks listed above with sheaves grooved for one 5/8-inch diameter rope line

B. Provide the following equipment, stored at fly gallery level with one half at stage left and one half at stage right:
1. Two 1200-foot coils of first quality 5/8-inch diameter Multiline II synthetic rope
2. Four 100# sandbags, filled, each with snap hooks with minimum 5/8-inch rope capacity.
3. Eight 50# sandbags, filled, each with snap hooks with minimum 5/8-inch rope capacity.
4. Eight 25# sandbags, filled, each with snap hooks with minimum 5/8-inch rope capacity.
5. Eight "Sunday hitches", each made of an 18-inch diameter loop of 1/4-inch 7x19 wire rope held with two Nicopress sleeves.
6. Eight 30-inch-long lengths of 1-1/2-inch NPS schedule 40 steel pipe to weight the spot lines onstage.

PART 3 - EXECUTION

3.1 GENERAL

A. Examine all conditions under which all presentation area rigging items shall be installed and notify the General Contractor in writing of any condition detrimental to the proper and timely completion of the work.

B. Contractor is solely and exclusively responsible for the satisfactory completion of this rigging system
1. Supply all tools required for the successful installation of the equipment herein.

2. Storage of all equipment and tools during the period of installation and for collecting and removing from the job site all packing materials, trash, scrap materials, etc.

C. The Stage Rigging Contractor shall be responsible for the protection of equipment and/or finished materials provided by other Contractors.

D. Prior to the completion of the installation, the Contractor shall notify the General Contractor and Architect to schedule an inspection of the system.
1. At the time of the inspection, the Stage Rigging Contractor shall furnish sufficient personnel to operate all equipment and to perform adjustments and tests as may be required by the Architect and/or the Owner's representatives.
2. Repair or replace equipment that does not meet specifications with new equipment
   a. Reschedule inspection under the same conditions listed previously
3. Remove all temporary to permit full operation and access to all equipment.
4. All temporary equipment shall be removed to permit full operation and access to all equipment.
5. Final review will be withheld until all systems have been thoroughly tested and found to be in first class operating condition in every circumstance.

3.2 INSTALLATION SUPERVISION

A. Installation of the rigging systems shall be supervised by the Contractor's own experienced superintendent having extensive experience in installing work of this kind.
1. Superintendent shall be an Entertainment Technician Certification Program (ETCP) Certified Rigger - Theatre.
   a. Contractor shall provide the Architect with a copy of the superintendent’s ETCP certification and shall make a copy of this certification available on the job site for the length of the installation.
2. An ETCP Certified Rigger - Theatre shall be present at all times during the rigging system installation.

B. The same individual shall remain in charge of the work throughout the installation of the rigging system until work is completed excepting only the intervention of circumstances completely beyond the control of the Stage Rigging Contractor.

C. The superintendent shall represent the Rigging System Contractor and all directions given to him shall be binding as if given to the Rigging System Contractor.
1. The Rigging System Contractor may require the Owner to confirm such directions in writing.

3.3 FIELD QUALITY CONTROL

A. Rigging System shall be installed in accordance with OSHA Safety and Health Standards and all local codes. All welding shall be in full compliance with the most recent edition of the Structural Welding Code (ANSI / AWS D1.1).

B. All equipment shall be installed in locations shown on Construction Drawings and shall be installed plumb, straight and true and shall function as designed.

C. All components shall be installed to prevent abrasion of moving items against any part of the building structure or other equipment.
1. Sheaves shall be so aligned as to provide fleet angles of the cables not exceeding 2 degrees.
2. Provide mule blocks, cable rollers and guides as required to provide proper alignment and movement around obstructions.

D. Eyes at cable terminations shall be formed over thimbles of correct size.

E. The Stage Rigging Contractor shall perform all drilling and fitting required in the setting of materials and all cutting and fitting required in the fitting of materials to the adjoining work of other Contractors.

3.4 OWNER TRAINING

A. Contractor’s installation superintendent shall perform owner training

B. Schedule instruction with the Owner's designated representatives.

C. Provide all O&M materials, as designated in this Specification, at the time of training

D. Instruction shall be independent of the system check-out and activation. Length of engineering check-out and activation shall not affect the length of instruction time.
1. Instruction shall not necessarily follow immediately after the system check-out and activation

E. Provide up to twelve hours of owner training to include the following:

1. Up to eight hours of instruction shall cover the safe and proper operation of the equipment, including limit switch placement and adjustment, use of the control panel, etc., to the Owner's designated representative.
2. An additional four hours of training shall be dedicated to walking up to six users through an ANSI inspection of one lineset of each type.
    a. ANSI inspection training shall cover what to look and listen for, how to identify common problems in each rigging system, and when a problem needs to be addressed immediately by a professional rigger.

F. Instruction, at Owner’s digression, may occur in multiple time blocks.
1. If training is non-continuous, provide one form for each training segment.

G. Provide written documentation of Owner training to the Owner upon completion.
1. Form to include:
    a. The date, time, and location of training.
    b. Name, title, company and signature of trainer.
    c. Name, title, and signature of all participants.
    d. Topics covered at training.

H. Training may be video and audio recorded by the owner at the owner’s expense.

END OF SECTION 11 61 36

SECTION 11 61 39

FIRE SAFETY CURTIAN

PART 1 - GENERAL

1.1 WORK OF THIS SECTION

A. This Section includes all labor, materials, equipment, and services necessary to furnish and install the Fire Curtain System as shown on the drawings and/or specified herein, including but not limited to the following:
   1. A motorized, straight lift, automatically closing fire curtain
   2. associated rigging and release line as indicated on the drawings and
   3. Meet all requirements applicable codes including NFPA and IBC.

B. Related work in other Sections:
   1. 116133 – Motorized Rigging
   2. 116136 – Counterweight Rigging
   3. 116123 – Theatrical and Acoustic Drapery

1.2 SUBSTITUTIONS

A. Substitutions are allowed when the substitution improves the quality, decrease installation time, or reduce cost.
   1. Submit a proposal that clearly outlines construction features of the product so that true and accurate comparisons may be made.
      a. Samples of the proposed substation item/s may be requested by the Architect and/or Owner for evaluation

B. No product bid which deviates from the details of the Construction Documents will be considered unless such deviation has been approved in advance by the Architect.

1.3 PROJECT CONDITIONS

A. Provide all new equipment of the latest design

B. No extras will be allowed due to the Contractor's misunderstanding of the work involved or its lack of knowledge of any field conditions due to failure to make accurate field measurements or a thorough investigation of the job site

1.4 SUBMITTALS

A. Submit shop drawings for review by the Architect before fabrication can begin. Such review does not relieve the Contractor of the responsibility of providing equipment in accordance with this Specification.

B. Shop Drawings:
   1. Show dimensions, sizes, gauges, thicknesses, finishes, joining, attachments and relationship of work to adjoining construction.
   2. Clearly show power, wire, and conduit requirements for all work to be provided by the Contractor.
   3. Where items must fit and coordinate with finished surfaces and/or constructed spaces, take measurements at site and not from drawings.
   4. Where other materials must be set to exact locations to receive rigging, furnish assistance and directions necessary to permit other trades to locate their work.
   5. Where welded connections, concrete or masonry inserts are required to receive work, show exact locations required and all such drawings shall be furnished to the trades responsible for installing the connectors or inserts.
   6. Show locations of all lubrication points.
   7. Include engineering and load calculations as well as stamp and seal of a registered professional engineer.
   8. Catalog work sheets showing illustrated cuts of items may be submitted for standard manufactured items.
   9. Include a copy of the installation superintendent’s ETCP Certified Rigger - Theatre certification. A copy of the installation superintendent’s ETCP certification shall be available on the job site for the length of the installation.

C. Any deviation from this Specification shall be clouded and noted in letters a minimum 1/4-inch high.
   1. In order for a deviation to be considered, it must upgrade the quality of the equipment or respond to a field condition.

D. The Stage Rigging Contractor shall, if requested by the Owner or Architect, furnish satisfactory evidence as to the kind and quality of materials he proposes to furnish by submission of exact samples of hardware to be used in this contract.
   1. Owner retains the samples until such time that this contract has been completed and accepted.

E. Upon completion of installation, Contractor shall provide Operation and Maintenance (O&M) manuals that shall include record shop drawings, parts lists, operational instruction, service/maintenance recommendations, component working load limits, etc.
   1. One printed “hard” copy of the O&M manual
   2. Two flash drive electronic versions of the O&M manual

1.5 WARRANTY

A. Assure that the rigging is properly installed, free of defects in materials and workmanship and shall provide a warranty on all equipment and workmanship provided under this contract for a period of two years from the date of the final acceptance.

B. During the warranty period, repair or replacement of defective materials and faulty workmanship shall be provided, at no cost to the Owner, within ten days of written notification of defects(s).

C. Post Installation Safety Inspection:
   1. One year after the date of final acceptance by the Owner, the installation superintendent shall return to the job site to conduct a thorough inspection of the rigging installation.
      a. Check all bolts and tighten as required, inspect all cable connections and give all items a thorough safety inspection in compliance with ANSI E1.47, Entertainment Technology – Recommended Guidelines for Entertainment Rigging System Inspections.
      b. Repair or replace all damaged items
      c. If the original superintendent is unavailable either because the superintendent no longer works for the contractor or due to issues fully beyond the control of the contractor, then an alternate rigger superintendent shall perform the inspection, under the following conditions:
         1) Be ETCP-RT certified
         2) Have experience supervising installation on projects of similar scope and scale
   2. The Contractor is responsible for all materials, superintendent labor, transportation and living expenses for this work at no additional cost to the Owner.
      a. Conduct inspection and repair work during normal working hours at a time mutually agreed upon by the Owner and the Contractor.
   3. Provide the Owner and Architect with a written report stating the findings of the inspection within two weeks of completion of the inspection.

PART 2 - PRODUCTS

2.1 APPROVED MANUFACTURERS

A. Manufacturers for work in this section:
   1. Weiss Inc.
      Fairview, NJ
      (201) 402-6500
      https://www.iweiss.com/
   2. J.R. Clancy Inc.
      Syracuse, NY
      (315)451-3440
      https://www.jrclancy.com/
   3. Texas Scenic Co.
      San Antonio, TX
      (210) 684-0091
      https://www.texasscenic.com/

4. Protech Theatrical Services, Inc.
   3431 N. Bruce St.
   Las Vegas NV
   (702) 639-0290
   www.protechlv.com

B. The Contractor shall have been continuously engaged in the production of theatrical stage rigging equipment for at least fifteen years.

C. The Contractor shall have installed a total of not less than five installations of equal or greater scope to system specified herein, which have been in service for a minimum of one year and a maximum of ten years.
   1. Each of the listed stage rigging installations shall be in service in fully professional commercial theatres being operated by professional technicians.

D. The Contractor for this section shall be the same Contractor that furnishes and installs the following related Division 11 theatrical systems specified on this project:
   1. 116133 – Motorized Rigging
   2. 116136 – Counterweight Rigging

2.2 GENERAL

A. Curtain sized as shown on the drawings and operate from stage right
   1. Verify dimensions in the field

B. Operate curtain within smoke pockets

C. Provide an approved curtain of non-combustible material designed and installed to protect against the passage of flame, smoke, and hot gases in the proscenium opening

D. The curtain shall be operated by an automatic heat activated device to descend instantly and safely and to completely close the proscenium opening, and, by an auxiliary operating device, to permit prompt and immediate manual closing of the proscenium opening.
   1. Duration and speed of the automatic closing function of the fire curtain shall meet all applicable codes and standards, including NFPA, IBC, and ANSI E1.22.
   2. Provide electric fusible links or electronic release mechanism that, upon receiving signal from fire alarm system, lowers the fire curtain.

E. Provide all items not intentionally omitted to make the fire curtain installation complete in all respects to conform with applicable NFPA and Building Codes and Regulations.

2.3 MATERIALS

A. Ferrous materials and accessories shall conform to the following ASTM and ANSI standard specifications:
   1. Standard structural steel shapes and plates:
      a. ASTM A-36.
   2. Miscellaneous steel items:
      a. ASTM A-283, grade optional.
   3. Steel pipe:
      a. ASTM A-53
   4. Gray iron castings:
      a. ASTM A-48, Class 30 unless otherwise specified.
   5. Malleable iron castings:
      a. ASTM A-47
   6. Bolts and nuts:
      a. B18.2.1&2
   7. Welding electrodes shall be as permitted by AWS Code D1.0.

B. Wire Rope and Fittings
   1. Wire rope shall be 7x19 construction, utility cable, sized as required, that meets Federal Specification RR-W-410E.
      a. Damaged or deformed cables shall not be used.
   2. Cable fittings shall be Nicopress copper sleeves or forged steel clips and conform to wire rope manufacturer's recommendations as to size, number and method of installation.

C. Aluminum Materials and Accessories
   1. Thicknesses, gauges and tempers of aluminum products shall be as required for proper forming operations and to meet structural standards.
   2. Aluminum Castings: 214 or 356 alloy as per strength requirements.

3. Fasteners: Include bolts, nuts, washers, screws, nails, rivets and other fastenings necessary for proper erection and/or assembly of aluminum work.
4. Fabrication shall be by AWS certified welders.

D. Finishes for Items Without Factory Finish
1. Welds, burrs and rough surfaces on all interior ferrous metals shall be ground smooth and the completed assembly cleaned and all metal surfaces shall be given a minimum one coat of finish paint.
2. No painted finish shall be required on aluminum finishes.
3. All exposed fastenings shall match color and finish of adjacent material.

E. Pipes
1. Provide a 2-inch NPS, schedule 40 steel pipe batten placed in the pocket at the top of the curtain
2. Provide a 2-inch NPS schedule 40 steel pipe batten in the bottom pocket of the curtain.

2.4 SAFETY STANDARDS

A. In order to establish minimum standards of safety, the following factors shall be used:
1. Cables and fittings: 8:1 Safety Factor
2. Terminating hardware: 5:1, or not exceeding WLL, whichever is more restrictive.
3. Trim chain assembly: 5:1, or not exceeding WLL, whichever is more restrictive.
4. Batten clamps: 5:1, or not exceeding WLL, whichever is more restrictive.
5. Motors: 1.0 Service factor
6. Gearboxes: 1.25 Mechanical Strength Service Factor
7. Cable bending ratio: Sheave diameter is 30 times diameter of cable
8. Tread pressures: 500# for cast iron, 900# for Nylatron ,1000# for steel
9. Maximum fleet angle: 1-1/2 degrees
10. Steel: 1/5 of yield
11. Bearings: L10 life of 2000 hours at two times required load at full speed
12. Bolts: Grade 5 or better, plated

2.5 STRAIGHT LIFT FIRE CURTAIN

A. Construction:
1. Non-combustible, non-asbestos, non-carcinogenic, silica-based cloth of sufficient weight and composition
   a. Meets or exceeds the requirements set forth in all applicable codes and standards, including NFPA, IBC, and ANSI E1.22
   b. Continuous length of fabric running vertically
      1) No horizontal seams
   c. Minimum 1” overlap with double rows of stitching on seams.
   d. Sew with flame retardant thread that has the same or greater thickness than the yarns in the cloth

B. Provide minimum 6-inch pockets of double thickness at the top and bottom of the curtain for the pipe battens.
1. On the back of the bottom pocket provide openings at each end, at center line, and 21 feet left and right of center line making installation of bottom pipe easier.

C. At the bottom of the curtain, provide a 3-inch-thick yielding pad of non-combustible material to form a seal when the fire curtain is in the closed position.
1. The yielding pad shall be covered with a double thickness of cloth.

D. Wire Guides
1. At each side of the fire curtain provide a minimum 6-inch turn back hem
2. Hold the sides of the fire curtain to the guide cables with bronze guides, placed not more than 18 inches apart
   a. Fasten each guide to the curtain with a minimum of three bolts or rivets.

E. Above the proscenium opening, provide a smoke seal between the fire curtain and the wall.
1. This seal shall be of sufficient width to bear on the curtain when the curtain is in the closed position.
2. Attach smoke seal to the upstage side of the proscenium wall

2.6 MOTORIZED FIRE SAFETY CURTAIN WINCH

A. Construction:
1. One motorized winch assembly with integrated centrifugal speed governor to control curtain descent containing the following:
a. Built-in metal safety enclosure
b. Basic control station
c. Provisions for attachment of clew guide cables.

B. Winch to hold curtain in storage position by means of a brake with release attached to the emergency release line. Use 1/4-inch 7x19 Small Diameter Specialty Cord for drive line. Aircraft cables are acceptable.
1. Virtually maintenance free winch for the user's ease of operation.
2. Utilize Four total factory-wired and tested limit switches, for both over travel and operational limits, as standard.
3. Winch shall comply with NFPA 80, Chapter 20 Fabric Fire Safety Curtains Standard.
4. Include winch as standard equipment

C. Capacity:
1. 1250 pounds as standard
2. If additional capacity is necessary, augment with a lattice-type guide track

D. Lattice-Type Guide Track:
1. Long enough to accommodate the counterweight arbor plus the travel of the curtain
2. Terminate wire ropes at the top of the arbor with jaw and eye turnbuckles
a. Provide thimbles to accommodate the cable and fit through the turnbuckle's eye
3. Cable shall be secured with proper size and number of wire rope clips or Nicopress sleeves
4. Provide turnbuckles rated for a safety factor of not less than 5
a. Long enough to allow six inches of adjustment after installation
b. Use jam nuts or "mouse" with wire to prevent rotation
5. Attach the lattice track to the wall along its length every 4-feet minimum, using 1/4-inch x 2-inch formed brackets
a. Provide all materials required to extend the lattice track out from any uneven proscenium wall conditions as required
6. Size arbor to properly counterbalance weight
a. Provide two locking stop collars and a minimum of three steel flat bar spacer plates on the arbor
7. Provide counterweight in various thicknesses to properly counterbalance the fire curtain plus
8. Provide spring stop bumpers at the bottom of the lattice track

E. Control system:
1. "Push-to-operate" style system
a. Attach directly to the winch enclosure
b. Works in tandem with wall mount release boxes
2. Maintained E-stop button shall operate a line contactor, which removes power completely from the reversing contactor and controls.

F. Low voltage controls:
1. UL listed
2. Factory wired and tested

G. Power shall not be required for emergency operation of Fire Curtain release system

2.7 EMERGENCY CONTROL LINE SYSTEM

A. Furnish and install a complete fire or emergency control line system, consisting of the following:
1. Minimum 3/32-inch 7x19 utility cable
2. Install one line on each side of the proscenium opening

B. Extend line system up both sides and above the proscenium opening.

C. Use a mechanical quick-release device that can be easily reset for any attachment to the emergency control line

2.8 MANUAL EMERGENCY DEPLOYMENT

A. Activate of one of two mechanical quick-release assemblies
1. one on each side of the proscenium opening.

B. Activation:
1. Pull a minimum 1-1/2-inch diameter red ring, attached to a quick-release pin that is pinned through two steel plates housing a minimum 1-inch diameter ring that is securely attached to the emergency release line.

C. Quick release mechanisms shall be such that they can quickly and easily be reset in the event of erroneous activation.

D. Other similar activation assemblies that are positive in nature and meet the basic criteria of the quick release system detailed above may be used.

2.9 ELECTRONIC EMERGENCY DEPLOYMENT

A. Provide one electronic mechanism which will release the fire line automatically upon signal from alarm system.
1. Mechanism shall allow for test release of the Fire Curtain fire line. If electric fusible links are provided, provide five additional links.
2. If an electrically held mechanism is provided, provide a battery and “trickle” charger to supply power to the mechanism to prevent release of fire curtain in the event of a power failure.

2.10 SIGNAGE

A. Display appropriate signs in English near each emergency control line release mechanism.
1. For the release system listed above, the sign shall read:

B. “IN CASE OF FIRE, PULL RED RING TO LOWER FIRE CURTAIN AUTOMATICALLY!” with an arrow pointing to the location of the ring.

C. Provide and install signs with white background and 3/8-inch-high red letters to be mounted on the wall on the stage level, fly gallery level, and loading bridge level at a position that is conspicuous to workers performing rigging work.
1. The signs shall read as shown on the drawings.
2. Use erasable marker for “Date of Last Inspection” and “Date of Next Required Inspection” information

2.11 SMOKE POCKETS

A. Construction:
1. 18 inches deep
2. Minimum 1/4-inch-thick structural steel shapes and plates with a bolted construction using minimum 3/8-inch Grade 5 bolts on minimum 4-foot centers to attach plates to the steel shapes for the entire height of the smoke pocket.
3. Begin at 6 inches off stage from the proscenium opening as shown on the drawings
4. Color: black

B. Vertically extend smoke pockets from the stage floor to the underside of the grid iron
1. Securely fasten to the upstage side of the proscenium wall with minimum 1/2-inch diameter Grade 5 bolts in anchors on minimum 4-foot centers.

2.12 RIGGING

A. Head Block
1. Head Block Construction:
a. Sheave:
1) 16-inch diameter
2) Grooved to conform to rope and cable manufacturer's recommendations
3) Machined, faced, lathe turned and grooved for the respective number of 1/4-inch cables and one 3/4-inch rope
4) Equip with at least six pipe spacers, through bolted to the side plates, to prevent cables escaping from the sheave grooves
b. Bearing:
1) At least 1-inch diameter hub
2) Tapered roller bearings with felt seals press fitted in the head block bore
c. Shaft:
1) Keyed to one side plate to prevent the shaft from rotating
2) Thread the opposite end of the shaft and equip with "Flexloc" self-locking nut

d. Side Plates:
1) 10-gauge steel
2) Weld to the base angle
e. Mounting Angle Iron:
1) Two support angle irons for mounting to building structure
a) Sized for the specific load
2) Minimum of two bolts per base angle or mounting clips of sufficient size

2. Component parts of head blocks shall meet the same requirements as head blocks listed in 116136 – Counterweight Rigging
3. Install head block in location as shown on drawings
4. Align head blocks so that each groove, its center and sides, remains in the same vertical axis when the sheave is rotated.
5. Provide additional support steel to elevate the head block as required.

B. Loft Blocks
1. Loft Block Construction:
a. Upright
b. Nylon
c. Sheave:
1) 12-inch diameter
2) Grooved to conform to rope and cable manufacturer's recommendations
3) Machined, faced, and bored for shaft and bearings
d. Bearing:
1) At least 2-inch diameter hub
2) Two tapered roller bearings in place operating on a 1/2-inch diameter steel shaft or sealed precision ball bearings on a 5/8-inch diameter steel shaft
e. Shaft:
1) Keyed to one side plate to prevent the shaft from rotating
2) Thread the opposite end of the shaft and equip with "Flexloc" self-locking nut
f. Side Plates:
1) Minimum 11-gauge steel
g. Mounting Angle Iron:
1) Two support angle irons for mounting to building structure
a) Sized for the specific load
2) Minimum of two bolts per base angle or mounting clips of sufficent size
h. Cables:
1) 1/4-inch 7x19 steel pick-up cables
2) Attach cables to the counterweight carriage using turnbuckles, cable thimbles and wire rope clips or Nicopress sleeves

2. Component parts of loft blocks shall meet the same requirements as loft blocks listed in 116136 – Counterweight Rigging
3. Install loft blocks at spacing as shown on drawings

C. Safety Chain
1. Provide 1/4-inch proof coil safety chains leading from the top batten to custom mounting steel as required.
a. Adjust chains so that they support the curtain when it is lowered, and the bottom batten is resting on the yield pad supported by the floor

PART 3 - EXECUTION

3.1 GENERAL

A. Examine all conditions under which all presentation area rigging items shall be installed and notify the General Contractor in writing of any condition detrimental to the proper and timely completion of the work.

B. Contractor is solely and exclusively responsible for the satisfactory completion of this rigging system
1. Supply all tools required for the successful installation of the equipment herein.
2. Storage of all equipment and tools during the period of installation and for collecting and removing from the job site all packing materials, trash, scrap materials, etc.

C. The Stage Rigging Contractor shall be responsible for the protection of equipment and/or finished materials provided by other Contractors.

D. Prior to the completion of the installation, the Contractor shall notify the General Contractor and Architect to schedule an inspection of the system.
   1. At the time of the inspection, the Contractor shall furnish sufficient personnel to operate all equipment and to perform adjustments and tests as may be required by the Architect and/or the Owner's representatives.
   2. Repair or replace equipment that does not meet specifications with new equipment
      a. Reschedule inspection under the same conditions listed previously
   3. Remove all temporary to permit full operation and access to all equipment.
   4. Final review will be withheld until all systems have been thoroughly tested and found to be in first class operating condition in every circumstance.

3.2 INSTALLATION SUPERVISION

A. Installation of the rigging systems shall be supervised by the Rigging System Contractor's own experienced superintendent having extensive experience in installing work of this kind.
   1. Superintendent shall be an Entertainment Technician Certification Program (ETCP) Certified Rigger - Theatre.
      a. Rigging System Contractor shall provide the Architect with a copy of the superintendent’s ETCP certification and shall make a copy of this certification available on the job site for the length of the installation.
   2. An ETCP Certified Rigger - Theatre shall be present at all times during the rigging system installation.

B. The same individual shall remain in charge of the work throughout the installation of the rigging system until work is completed excepting only the intervention of circumstances completely beyond the control of the Contractor.

C. The superintendent shall represent the Contractor and all directions given to him shall be binding as if given to the Contractor.
   1. The Contractor may require the Owner to confirm such directions in writing.

3.3 FIELD QUALITY CONTROL

A. Install rigging system in accordance with OSHA Safety and Health Standards and all local codes. All welding shall be in full compliance with the most recent edition of the Structural Welding Code (ANSI / AWS D1.1).

B. Install all equipment in locations shown on Construction Drawings
   1. Install plumb, straight and true and function as designed.

C. Install all components to prevent abrasion of moving items against any part of the building structure or other equipment.
   1. Align sheaves as to provide fleet angles of the cables not exceeding two degrees.
   2. Provide mule blocks, cable rollers and guides as required to provide proper alignment and movement around obstructions.

D. Form cable termination eyes over thimbles of correct size

E. The Contractor shall perform all drilling and fitting required in the setting of materials and all cutting and fitting required in the fitting of materials to the adjoining work of other Contractors.

3.4 OWNER TRAINING

A. Contractor’s installation superintendent shall perform owner training

B. Schedule instruction with the Owner's designated representatives.

C. Provide all O&M materials, as designated in this Specification, at the time of training

D. Instruction shall be independent of the system check-out and activation. Length of engineering check-out and activation shall not affect the length of instruction time.
   1. Instruction shall not necessarily follow immediately after the system check-out and activation

E. Provide up to four hours of owner training to include the following:
   1. Up to two hours of instruction shall cover the safe and proper operation of the equipment, including limit switch placement and adjustment, use of the control panel, etc., to the Owner's designated representative.
   2. An additional two hours of training shall be dedicated to walking up to 6 users through an ANSI inspection of one lineset of each type.
      a. ANSI inspection training shall cover what to look and listen for, how to identify common problems in each rigging system, and when a problem needs to be addressed immediately by a professional rigger.

F. Instruction, at Owner's digression, may occur in multiple time blocks.
   1. If training is non-continuous, provide one form for each training segment.

G. Provide written documentation of Owner training to the Owner upon completion.
   1. Form to include:
      a. The date, time, and location of training.
      b. Name, title, company and signature of trainer.
      c. Name, title, and signature of all participants.
      d. Topics covered at training.

H. Training may be video and audio recorded by the owner at the owner's expense.

END OF SECTION 11 61 39

SECTION 11 61 63

ORCHESTRA SHELL

PART 1 - GENERAL

1.1 WORK INCLUDED

A. This Section includes all labor, materials, equipment, and services necessary to manufacture, deliver and install an Orchestra Shell System as shown on the drawings and specified herein, including but not limited to the following:
   1. Rolling acoustic towers.
   2. Overhead acoustic ceiling panels.

B. It shall be the responsibility of the Orchestra Shell Manufacturer to furnish equipment complete in all respects and to provide any additional equipment required to fulfill the intent of these drawings and specifications regardless of whether or not such items are herein specified or indicated.

1.2 GENERAL

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

B. Related work in other Sections
   1. 116133 – Motorized Rigging

C. Site Conditions: Contractor shall be responsible for verifying that the job conditions are ready to receive work in this section. Contractor must alert the General Contractor to any existing conditions that may adversely affect execution of work, so that resolution may be reached before commencement of installation.

1.3 SUBMITTALS

A. Submittals shall be according to the Conditions of the Contract and Division Specification Sections.

B. Orchestra Shell Manufacturer shall prepare and submit complete shop drawings according to the requirements set forth in the Contract Documents.

C. Shop Drawings shall be submitted and reviewed by the Architect before fabrication can begin.
   1. Such review does not relieve the Orchestra Shell Manufacturer of the responsibility of providing equipment in accordance with this Specification.

D. Shop Drawings shall include layout, fabrication, and installation drawings showing product components in assembly with adjacent materials and products

E. Shop Drawings shall show dimensions, sizes, weights, gauges, thicknesses, finishes, circuiting, joining, attachments, lubrication points, and relationship of work to adjoining construction.

F. The Orchestra Shell Manufacturer shall, if requested by the Owner or Architect, furnish satisfactory evidence as to the kind and quality of materials he proposes to furnish by submission of exact samples of equipment to be used in this contract.
   1. The samples shall be retained by the Owner until such time that all items contracted for have been installed and accepted.

G. Upon completion of installation, Orchestra Shell Manufacturer shall submit three copies of an Operation and Maintenance manual which shall include as-built shop drawings, parts lists, operational instruction, maintenance recommendations, etc.
   1. One O&M manual shall be a printed hard copy.
   2. O&M manual shall also be provided in electronic format on two flash drives.

1.4 DELIVERY, STORAGE AND HANDLING

A. Delivery and installation of the Orchestra Shell System shall be as required in the Construction Documents.

B. Factory-assemble and finish components prior to shipment.

C. Deliver all materials to the job site suitably crated, packed and protected, and bearing the manufacturer's identification label and the nomenclature of the product(s) found in the carton.

D. Orchestra Shell Manufacturer shall confirm delivery dates with the Owner/Construction Manager a minimum of 30 days in advance of scheduled delivery.

1.5 WARRANTY

A. The Orchestra Shell System shall conform to all applicable code requirements and shall be in conformance with industry standards of operations and practice.
   1. All materials, arrangements, and procedures shall comply with applicable OSHA requirements.

B. The Orchestra Shell Manufacturer shall assure that the shell is properly installed, free of defects in materials and workmanship, and shall provide a warranty on all equipment and workmanship provided under this contract for a minimum two years from the date of the final acceptance by the Owner.

C. During the warranty period, repair or replacement of defective materials and/or repairs of faulty workmanship shall be provided, at no cost to the Owner, within 10 days of written notification of defects(s).

1.6 MANUFACTURERS

A. Manufacturers and orchestra shell systems for work of this Section shall include:
   1. Wenger Corporation
      Owatonna, MN
      (800) 268-0148
      https://www.wengercorp.com/
   2. StageRight Crop.
      Clare, MI
      (989) 386-7393
      https://stageright.com/
   3. Sightline Commercial Solutions
      Minneapolis, MN
      (877) 215-7245
      https://www.sightlinecommercial.com

B. Products of other manufacturers may be acceptable. However, manufacturers capable of providing specified products shall not, for convenience of their normal production methods, vary from the specification. Owner and Architect shall be the sole parties capable of determining bidder's compliance with specifications.

PART 2 - PRODUCTS

2.1 GENERAL

A. The Acoustical Shell System shall consist of a full stage symphonic enclosure made up of rolling acoustic towers and overhead ceiling panels of sufficient size and density to control and reflect a maximum range of audible frequencies.

B. The Shell System shall permit adjustment of reflector height and size to accommodate varying performance types and acoustical requirements. Acoustical panels shall be adjusted for angle and position to assure proper blending and projection of sound.

C. The Shell System shall be designed to permit easy storage without dismantling.

D. Orchestra shell towers and ceiling panels shall be stressed-skin composite type with a minimum of STC 23 to meet performance requirements
   1. The core of the towers and ceiling panels shall be 1-1/2" thick honeycomb material that has an open geometric pattern with cell walls vertical to panel skins and defined by alternating straight and sine wave layers.
      a. Height of sine wave shall be 1/2", wall thickness shall correspond to 60lb. Kraft.
      b. Bonding of core material to panel faces shall be with permanently cured urethane adhesive. Foam core materials and contact adhesives shall not be permitted.

E. The face of the panels shall be 1/4" thick veneer hardwood plywood-faced medium density fiberboard stressed skin, in stain color selected by the Owner, with no exposed fasteners.
   1. Veneer shall be slip-matched and balance matched within the panel face.
   2. Finish shall be transparent, comparable to AWI custom grade acrylic lacquer.

F. Provide deduct pricing for the following face panel alternates in lieu of the base project hardwood veneer plywood:
   1. For all panels, the face of the panels shall be plastic laminate top surface on 3/16-inch-thick hardboard stressed skin. Plastic laminate shall be in color selected by Owner, with no exposed fasteners.

G. Back of each panel shall be 3/16” thick hardboard stressed skin, painted black.

H. Straight panel edges shall be reinforced with extruded aluminum edge frame.

2.2 ROLLING ACOUSTIC TOWERS

A. Acoustic towers shall be self-supporting, sound reflecting structures equipped with leveling, nesting "A-shaped" counterweighted bases and all hardware necessary to safely transport them to and from storage and lock into place when in "performance" position.

B. Provide rolling wall towers in sizes as shown on the drawing.

C. The wall tower base shall incorporate a counterweight of required weight to allow the towers to be moved safely about the stage.

D. Structural frames shall incorporate tower wing hinges.

E. Each tower shall be movable by transporter(s) that lock onto and lift the towers and allows them to move safely about the stage.
   1. Transporter shall allow towers to be moved in any direction.

F. Each tower base shall have multiple, adjustable height levelers to allow for irregularities in the stage floor.

G. Numbered markers shall be inserted flush with the stage floor indicating the location of each tower insuring consistent setup.

H. Towers shall consist of three panels hinged together to obtain tower width as indicated on drawings.

I. Designated side wall towers shall be equipped with doors for entering and exiting the performing area. Doorways shall have a minimum of 3'-0" wide open clearance.
   1. Doors shall have self-lubricating bearings for quiet operation.

J. All instructions pertaining to the safe handling and operation of the towers shall be affixed to the tower in plain view.

2.3 OVERHEAD CEILING PANELS

A. Stage overhead ceiling panels shall be sound reflective and include integral hardware for storage without interference with adjacent stage equipment.
   1. Ceiling panel shall be in sizes as shown on the drawings.
   2. Verify dimensions in shop drawings.

B. Overhead panels shall be ~~removable and also~~ designed to fold vertically permitting storage on the stage rigging system. The overhead panel design shall allow each panel to be rotated by two people.

C. Each overhead panel shall be equipped with necessary hardware to hang from a stage rigging lineset 1-1/2" NPS schedule 40 pipe truss batten.
   1. Method of attachment to truss batten must allow for installation or removal of each overhead panel.
   2. Hardware must permit angular adjustment from horizontal plane to 40 degrees.
   3. The hardware must also have the capability of locking the panels in a vertical position so that they may be stored on the batten.

D. Integral LED light fixtures shall be incorporated into the ceiling to provide an even, general down light wash of the stage. Shop drawings shall reflect Shell Manufacturer suggested fixture locations.
   1. A mechanical tilt switch shall be provided at each light fixture to prevent accidental activation when the ceiling panel is in the vertical, storage position.

E. When the panels are stored on the rigging batten, the maximum upstage/down stage storage space required shall be 14”.

F. Each complete row of ceiling panels shall not exceed the load capacity of the designated linesets. Verify weight in shop drawings.

PART 3 - EXECUTION

3.1 GENERAL

A. Examine all conditions under which all Orchestra Shell items shall be installed and notify the Construction Manager in writing of any condition detrimental to the proper and timely completion of the work.

B. Responsibility for the manufacture and installation of the orchestra shell shall rest solely and exclusively with the Orchestra Shell Manufacturer.

C. The Orchestra Shell System Manufacturer shall be responsible for storage of all equipment and tools during the period of installation.

D. The Orchestra Shell Manufacturer shall be responsible for collecting and removing all packing materials, trash, scrap materials, etc. from the job site.

E. The Orchestra Shell Manufacturer shall be responsible for the protection of equipment and/or finished materials provided by other Contractors.

F. Prior to the completion of the installation, the Orchestra Shell Manufacturer shall notify the Construction Manager to arrange a date for observation of the system.
   1. At the time of the observation, the Orchestra Shell Manufacturer shall furnish sufficient personnel to operate all equipment and to perform adjustments as required by the Owner's representatives.

3.2 INSTALLATION

A. Installation of the orchestra shell shall be supervised by the Orchestra Shell Manufacturer's own experienced superintendent having extensive experience in installing work of this kind.

B. Orchestra shell overhead ceiling panels shall be installed on stage rigging single purchase, tee-bar guided line sets with motorized winch assist provided by the Rigging Manufacturer/Installer in locations shown on the drawings.

C. Verify setting of units in performance and storage positions.

D. Verify adjustability of units.

E. Install and test integral lighting.

F. The superintendent or other Orchestra Shell Manufacturer's representative shall provide minimum four hours of instruction to Owner's designated representative(s) in the safe, efficient operation of the Orchestra Shell System.

3.3 FIELD QUALITY CONTROL

A. All equipment shall be installed in locations shown on Construction Drawings and shall be installed plumb, straight and true, and function as designed, safely and quietly, in accordance with manufacturer’s recommendations and approved submittals.

B. All lighting fixtures shall be focused by the Orchestra Shell Manufacturer to provide an even, general down light wash of the stage.

C. Clean exposed surfaces of acoustical shells. Comply with manufacturer’s written instructions for cleaning and touchup of minor finish damage.

D. Repair or replace defective work as directed by Architect upon inspection.

END OF SECTION 11 61 63

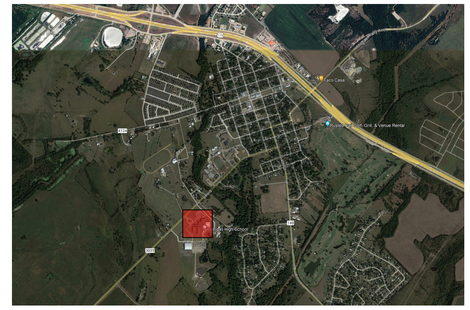
CRANDALL ISD

PERFORMING ARTS CENTER ADDITION TO CRANDALL HIGH SCHOOL

13385 FM 3039
CRANDALL, TX 75114

ISSUE FOR BID AND PERMIT
07.25.2024

PROJECT LOCATION



PROJECT TEAM

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PROJECT DESCRIPTION

A NEW GROUND UP ADDITION TO THE EXISTING CRANDALL ISD HIGH SCHOOL. ADDITION WILL HOUSE PERFORMING ARTS LEARNING SPACES ALONG WITH A NEW PERFORMING ARTS THEATER. NEW ADDITION WILL BE SEPARATED FROM THE EXISTING HIGH SCHOOL WITH AN EXISTING FIRE WALL.

BUILDING CODE INFORMATION

2021 INTERNATIONAL BUILDING CODE (IBC)
2021 INTERNATIONAL FIRE CODE (IFC)
2021 INTERNATIONAL MECHANICAL CODE (IMC)
2021 INTERNATIONAL FUEL GAS CODE (IFGC)
2023 NATIONAL ELECTRICAL CODE (NEC)
2021 INTERNATIONAL ENERGY CONSERVATION CODE (IECC)
2012 TEXAS ACCESSIBILITY STANDARDS (TAS)

SHEET LIST

.GENERAL.

G0.1	COVER SHEET
G1.1	GENERAL NOTES, SYMBOLS AND ABBREVIATIONS
	.CODE.
CP0.1	BUILDING USE ANALYSIS
CP1.1	LEVEL 01 - CODE PLAN
CP1.2	LEVEL 02 - CODE PLAN
CP1.3	AUDIENCE CHAMBER CATCHMENT ZONES
CP2.0	TESTED ASSEMBLIES
CP2.1	TESTED ASSEMBLIES
	ENERGY
EN0.1	MECHANICAL COMPLIANCE CERTIFICATE
EN0.2	ENVELOPE COMPLIANCE CERTIFICATE
EN0.3	LIGHTING COMPLIANCE CERTIFICATE
	.CIVIL.
C1.00	CIVIL COVER SHEET
C1.01	EXISTING TOPOGRAPHIC PLAN
C1.02	DEMOLITION PLAN
C1.03	SITE PLAN
C1.04	DIMENSION CONTROL PLAN
C1.05	DIMENSION CONTROL PLAN INSET
C1.06	GRADING PLAN
C1.07	GRADING PLAN LOADING DOCK INSET
C1.08	STORM DRAIN PLAN
C1.09	STORM DRAIN PROFILES
C1.10	WATER AND SANITARY SEWER PLAN
C1.11	PAVING PLAN
C1.12	EROSION CONTROL PLAN
C1.13	EROSION CONTROL DETAILS
C1.14	SITE DETAILS
C1.15	PAVING DETAILS
C1.16	STORM DRAIN DETAILS
C1.17	WATER AND SANITARY SEWER DETAILS
C1.18	WATER DETAILS
L1.01	LANDSCAPE PLAN
L1.02	LANDSCAPE NOTES
L1.03	LANDSCAPE DETAILS
L1.04	LANDSCAPE DETAILS
IR1.01	IRRIGATION PLAN
IR1.02	TREE IRRIGATION PLAN
IR1.03	IRRIGATION SCHEDULE & NOTES
IR1.04	IRRIGATION DETAILS

.ARCHITECTURAL.

AS1.1	ARCHITECTURAL SITE PLAN
AS1.2	ARCHITECTURAL SITE ENLARGED PLANS
AD1.1B	LEVEL 01 - AREA B- DEMOLITION PLAN
AD3.1B	LEVEL 01 - AREA B - REFLECTED CEILING DEMOLITION PLAN
A1.1	LEVEL 01 - OVERALL PLAN
A1.1A	LEVEL 01 - AREA A - FLOOR PLAN
A1.1B	LEVEL 01 - AREA B - FLOOR PLAN
A1.2	LEVEL 02 - OVERALL PLAN
A1.2A	LEVEL 02 MEZZANINE - AREA A - FLOOR PLAN
A1.3	LEVEL 03 CATWALK - OVERALL PLAN
A1.4	OVERALL ROOF PLAN
A2.1	ENLARGED PLAN - AUDIENCE CHAMBER - LEVEL 01
A2.2	ENLARGED PLAN - AUDIENCE CHAMBER - LEVEL 02
A2.3	ENLARGED PLAN - AUDIENCE CHAMBER - CATWALK
A2.4	ENLARGED PLAN - AUDIENCE CHAMBER - LOADING BRIDGE
A2.5	ENLARGED PLAN - AUDIENCE CHAMBER - GRID LEVEL
A2.6	ENLARGED PLAN - AUDIENCE CHAMBER - SEATING PLAN
A2.11	ENLARGED PLAN - BAND / PERCUSSION ROOMS RENOVATION
A2.12	ENLARGED PLAN - BAND / PERCUSSION ROOMS RENOVATION
A2.15	ENLARGED RESTROOM PLANS AND ELEVATIONS - FRONT OF HOUSE
A2.16	ENLARGED RESTROOM PLANS AND ELEVATIONS - BACK OF HOUSE
A3.0	TYPICAL CEILING PLANS RULES
A3.1	LEVEL 01 - OVERALL REFLECTED CEILING PLAN
A3.1A	LEVEL 01 - AREA A - REFLECTED CEILING PLAN
A3.1B	LEVEL 01 - AREA B - REFLECTED CEILING PLAN
A3.2	LEVEL 02 - OVERALL REFLECTED CEILING PLAN
A3.2A	LEVEL 02 - MEZZANINE - AREA A - REFLECTED CEILING PLAN
A3.3	LEVEL 03 - CATWALK & GRID - REFLECTED CEILING PLAN
A3.4	LEVEL 04 - GRID - REFLECTED CEILING PLAN
A4.1	EXTERIOR ELEVATIONS
A4.2	EXTERIOR ELEVATIONS
A5.1	BUILDING SECTIONS
A5.2	BUILDING SECTIONS
A6.1	WALL SECTIONS
A6.2	WALL SECTIONS
A7.1	STAIR VIEWS
A7.2	STAIR VIEWS
A8.2	PARTITION TYPES
A8.3	DOOR & FRAME TYPE & SCHEDULE
A8.5	WINDOW TYPES, SCHEDULES, & ELEVATIONS

.ARCHITECTURAL.

A9.0	EXTERIOR ASSEMBLIES
A9.1	EXTERIOR DETAILS
A9.2	EXTERIOR DETAILS
A9.3	EXTERIOR DETAILS
A9.4	EXTERIOR DETAILS
A9.5	EXTERIOR DETAILS
	INTERIORS.
A10.1	INTERIOR ELEVATIONS
A10.2	INTERIOR ELEVATIONS
A10.3	INTERIOR ELEVATIONS
A10.4	INTERIOR ELEVATIONS
A10.5	INTERIOR ELEVATIONS
A10.6	INTERIOR ELEVATIONS
A10.7	INTERIOR ELEVATIONS
A10.8	INTERIOR ELEVATIONS
A10.9	INTERIOR ELEVATIONS
A10.10	INTERIOR ELEVATIONS
A10.11	INTERIOR ELEVATIONS
A11.1	INTERIOR DETAILS - PARTITIONS
A11.2	INTERIOR DETAILS - DOOR AND FRAME
A11.3	INTERIOR DETAILS - FLOORING
A11.4	INTERIOR DETAILS - GENERAL
A11.5	INTERIOR DETAILS - GENERAL CONT.
A11.6	INTERIOR DETAILS - VERTICAL CIRCULATION
A11.7	INTERIOR DETAILS - AUDIENCE CHAMBER
A11.8	INTERIOR DETAILS - AUDIENCE CHAMBER
A11.9	INTERIOR DETAILS - AUDIENCE CHAMBER
A11.10	INTERIOR DETAILS - AUDIENCE CHAMBER
A12.01	FINISH SCHEDULES
A12.1A	LEVEL 01 - AREA A - FINISH PLAN
A12.1B	LEVEL 01 - AREA B - FINISH PLAN
A12.2A	LEVEL 02 - AREA A - FINISH PLAN
A12.2B	LEVEL 02 - AREA B - FINISH PLAN
A12.3	LEVEL 03 - CATWALK - FINISH PLAN
A13.1A	LEVEL 01 - AREA A - FF&E PLAN
A13.1B	LEVEL 01 - AREA B - FF&E PLAN
A13.2A	LEVEL 02 - AREA A - FF&E PLAN
	.STRUCTURAL.
S0.1	GENERAL STRUCTURAL NOTES
S0.2	GENERAL STRUCTURAL NOTES & SPECIAL INSPECTIONS
S0.3	GENERAL STRUCTURAL NOTES, SYMBOLS & ABBREVIATIONS

.STRUCTURAL.

S1.1	LEVEL 01 OVERALL FOUNDATION PLAN
S1.1A	LEVEL 01 AREA A - FOUNDATION PLAN
S1.1B	LEVEL 01 AREA B - FOUNDATION PLAN
S2.2A	LEVEL 02 MEZZANINE - AREA A - FRAMING PLAN
S2.3	LEVEL 03 CATWALK - OVERALL FRAMING PLAN
S2.3A	LEVEL 03 CATWALK - AREA A - FRAMING PLAN
S2.3B	LEVEL 03 CATWALK - AREA B - FRAMING PLAN
S2.4A	LEVEL 04 AUDIENCE CHAMBER - AREA A - FRAMING PLAN
S2.6A	LEVEL 06 STAGE HOUSE - AREA A - FRAMING PLAN
S3.1	STRUCTURAL DETAILS
S3.2	STRUCTURAL DETAILS
S3.4	STRUCTURAL DETAILS
S3.5	STRUCTURAL DETAILS
S5.1	STEEL TYPICAL DETAILS
S5.2	STEEL TYPICAL DETAILS
S5.3	STEEL TYPICAL DETAILS
S5.4	STEEL SECTIONS
S5.5	STEEL SECTIONS
S5.6	STEEL SECTIONS
S5.7	STEEL SECTIONS
S5.8	STEEL SECTIONS
S5.9	STEEL SECTIONS
S6.1	BRACE ELEVATIONS
S6.2	BRACE ELEVATIONS
	.FIRE PROTECTION.
FP0.1	FIRE PROTECTION SYMBOLS & ABBREVIATIONS
FP0.2	FIRE PROTECTION ABBREVIATIONS
FP1.1	LEVEL 01 - FIRE PROTECTION PLAN
FP1.2A	LEVEL 02 MEZZANINE - AREA A - FIRE PROTECTION PLAN
	.PLUMBING.
P0.1	PLUMBING GENERAL NOTES & SYMBOLS
P0.2	PLUMBING ABBREVIATIONS
P02.1B	LEVEL 01 - AREA B - DEMOLITION PLAN
P2.1	OVERALL UNDERGROUND PLUMBING PLAN
P2.1B	LEVEL 01 - AREA B - PLUMBING PLAN
P2.1A	LEVEL 01 - AREA A - PLUMBING PLAN

.PLUMBING.

P2.2AB	LEVEL 02 MEZZANINE - AREA A - PLUMBING PLAN
P2.3	OVERALL ROOF PLUMBING PLAN
P3.1	ENLARGED PLUMBING PLANS
P4.1	WASTE & VENT RISER DIAGRAMS
P4.2	DOMESTIC RISER DIAGRAM
P4.3	STORM RISER DIAGRAM
P5.1	PLUMBING DETAILS
P6.1	PLUMBING SCHEDULES
	.MECHANICAL.
M0.1	MECHANICAL SYMBOLS, ABBREVIATIONS & NOTES
MD1.1B	LEVEL 01 - AREA B - HVAC DEMOLITION PLAN
M1.1A	LEVEL 01 - AREA A - HVAC PLAN
M1.1B	LEVEL 01 - AREA B - HVAC PLAN
M1.2A	LEVEL 02 MEZZANINE - AREA A - HVAC PLAN
M1.3A	LEVEL 03 - AREA A - ROOF MECHANICAL PLAN
M1.3B	LEVEL 03 - AREA B - MECHANICAL PLAN
M1.4B	LEVEL 04 - AREA B - ROOF MECHANICAL PLAN
M5.1	CONTROLS DIAGRAMS
M5.2	CONTROLS DIAGRAMS
M5.3	CONTROLS DIAGRAMS
M7.1	MECHANICAL DETAILS
M7.2	MECHANICAL DETAILS
M8.1	MECHANICAL SCHEDULES
	.ELECTRICAL.
E0.1	ELECTRICAL SYMBOLS, ABBREVIATIONS & NOTES
ED1.1B	LEVEL 01 - AREA B - ELECTRICAL DEMOLITION PLAN
ES1.1	ELECTRICAL SITE PLAN
ES1.2	SITE LIGHTING PHOTOMETRICS

.ELECTRICAL.

EL1.1A	LEVEL 01 - AREA A - LIGHTING PLAN
EL1.1B	LEVEL 01 - AREA B - LIGHTING PLAN
EL1.2A	LEVEL 02 MEZZANINE - AREA A - LIGHTING PLAN
EL1.3A	LEVEL 03 CATWALK - AREA A - LIGHTING PLAN
EL1.4A	LEVEL 04 GRID - AREA A - LIGHTING PLAN
ELF1.1A	LEVEL 01 - AREA A - LIGHTING FLOOR PLAN
ELF1.3A	LEVEL 03 - AREA A - LIGHTING FLOOR PLAN
E2.1	LEVEL 01 - POWER PLAN
E2.1A	LEVEL 01 - AREA A - POWER PLAN
E2.1B	LEVEL 01 - AREA B - POWER PLAN
E2.2A	LEVEL 02 MEZZANINE - AREA A - POWER PLAN
E2.3A	LEVEL 03 CATWALK - AREA A - POWER PLAN
E2.4A	LEVEL 04 GRID - AREA A - POWER PLAN
E2.5A	ROOF LEVEL - POWER PLAN
E2.6A	ROOF LIGHTNING PROTECTION PLAN
E3.1A	LEVEL 01 - AREA A - SPECIAL SYSTEMS PLAN
E3.1B	LEVEL 01 - AREA B - SPECIAL SYSTEMS PLAN
E3.2A	LEVEL 02 MEZZANINE - AREA A - SPECIAL SYSTEMS PLAN
E3.3A	LEVEL 03 CATWALK - AREA A - SPECIAL SYSTEMS PLAN
E5.1	ELECTRICAL DIAGRAMS
E6.1	ELECTRICAL DETAILS
E6.2	ELECTRICAL DETAILS
E6.3	ELECTRICAL DETAILS
E6.4	LIGHTING ELEVATIONS
E6.5	LIGHTING ELEVATIONS
E7.1	LIGHTING SCHEDULES
E7.2	ELECTRICAL SCHEDULES
E7.3	ELECTRICAL SCHEDULES
E7.4	ELECTRICAL SCHEDULES

.THEATRICAL.

QT0.01	THEATRICAL GENERAL INFORMATION
QT1.01	LEVEL 1 - THEATRICAL LIGHTING PLAN
QT1.02	LEVEL2 - THEATRICAL LIGHTING PLAN, CONTROL BOOTH AND ELECTRICS
QT1.03	LEVEL 3 - THEATRICAL LIGHTING PLAN, CATWALK AND FOLLOWSPOT
QT1.04	LEVEL 4 - THEATRICAL LIGHTING PLAN, GRID
QT1.21	LEVEL 1 - THEATRICAL DRAPERY PLAN - THEATER
QT1.22	LEVEL 1 - THEATRICAL DRAPERY PLAN AND SECTION - PERCUSSION ROOM
QT1.23	LEVEL 2 - THEATRICAL AND ACOUSTIC DRAPERY PLAN, CATWALK
QT1.31	LEVEL 1 - THEATRICAL RIGGING PLAN
QT1.32	LEVEL 2 - THEATRICAL RIGGING PLAN
QT1.33	LEVEL 3 - THEATRICAL RIGGING PLAN - LOADING BRIDGE
QT1.34	LEVEL 4 - THEATRICAL RIGGING PLAN - GRID
QT4.21	LEVEL 1 - ORCHESTRA PIRELI PLAN
QT5.21	THEATRICAL DRAPERY, LONGITUDINAL SECTION
QT5.22	THEATRICAL & ACOUSTIC DRAPERY SECTIONS
QT5.23	THEATRICAL RIGGING - TRANSVERSE SECTION - TYPICAL COUNTERWEIGHT LINESET
QT5.24	THEATRICAL RIGGING TRANSVERSE SECTION - MOTORIZED LIGHTING LINESET
QT5.25	THEATRICAL RIGGING - TRANSVERSE SECTION - MOTORIZED ACOUSTIC CEILING LINESET
QT5.26	THEATRICAL RIGGING - TRANSVERSE SECTION - FIRE CURTAIN
QT5.31	THEATRICAL RIGGING - LONGITUDINAL SECTION
QT5.61	ORECHESTRA SHELL SECTION
QT5.11	THEATRICAL WIRING DEVICE DETAILS & SCHEDULE
QT5.12	THEATRICAL CONTROL DEVICE DETAILS & SCHEDULE
QT5.14	THEATRICAL HOUSE LIGHT CONTROL DEVICE DETAILS & SCHEDULE
QT5.15	THEATRICAL RACK & PANEL PHYSICAL PROPERTIES
QT5.21	THEATRICAL & ACOUSTIC DRAPERY DETAILS
QT5.22	THEATRICAL & ACOUSTIC DRAPERY DETAILS Copy 1
QT5.31	THEATRICAL RIGGING DETAILS
QT5.33	THEATRICAL RIGGING DETAILS, FIRE CURTAIN
QT5.36	THEATRICAL RIGGING DETAILS, SIGNAGE
QT5.37	THEATRICAL RIGGING POWER & CONTROL DIAGRAM
QT6.11	THEATRICAL LIGHTING CONTROL DIAGRAM

.AUDIOVISUAL.

TA0.01	AUDIOVISUAL GENERAL NOTES
TA0.01	AUDIOVISUAL GENERAL NOTES
TA0.02	AUDIOVISUAL GENERAL DETAILS
TA0.02	AUDIOVISUAL GENERAL DETAILS
TA1.01	AUDIOVISUAL WIRING DEVICE PLAN, FIRST LEVEL - AREA A
TA1.01A	LEVEL 01 - AREA A - AUDIOVISUAL WIRING DEVICE PLAN
TA1.01B	LEVEL 01 - AREA B - AUDIOVISUAL WIRING DEVICE PLAN
TA1.02A	LEVEL 02 - AREA A - AUDIOVISUAL WIRING DEVICE PLAN
TA1.03A	CATWALK - AREA A - AUDIOVISUAL WIRING DEVICE PLAN
TA1.11	AUDIOVISUAL EQUIPMENT PLAN, FIRST LEVEL - AREA A
TA1.11A	LEVEL 01 - AREA A - AUDIOVISUAL EQUIPMENT PLAN
TA1.11B	LEVEL 01 - AREA B - AUDIOVISUAL EQUIPMENT PLAN
TA1.12A	LEVEL 02 - AREA A - AUDIOVISUAL EQUIPMENT PLAN
TA1.13A	CATWALK - AREA A - AUDIOVISUAL EQUIPMENT PLAN
TA2.01A	LEVEL 01 - AREA A - REFLECTED CEILING PLAN
TA2.01B	LEVEL 01 - AREA B - REFLECTED CEILING PLAN
TA2.02A	LEVEL 02 - AREA A - REFLECTED CEILING PLAN

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COVER SHEET

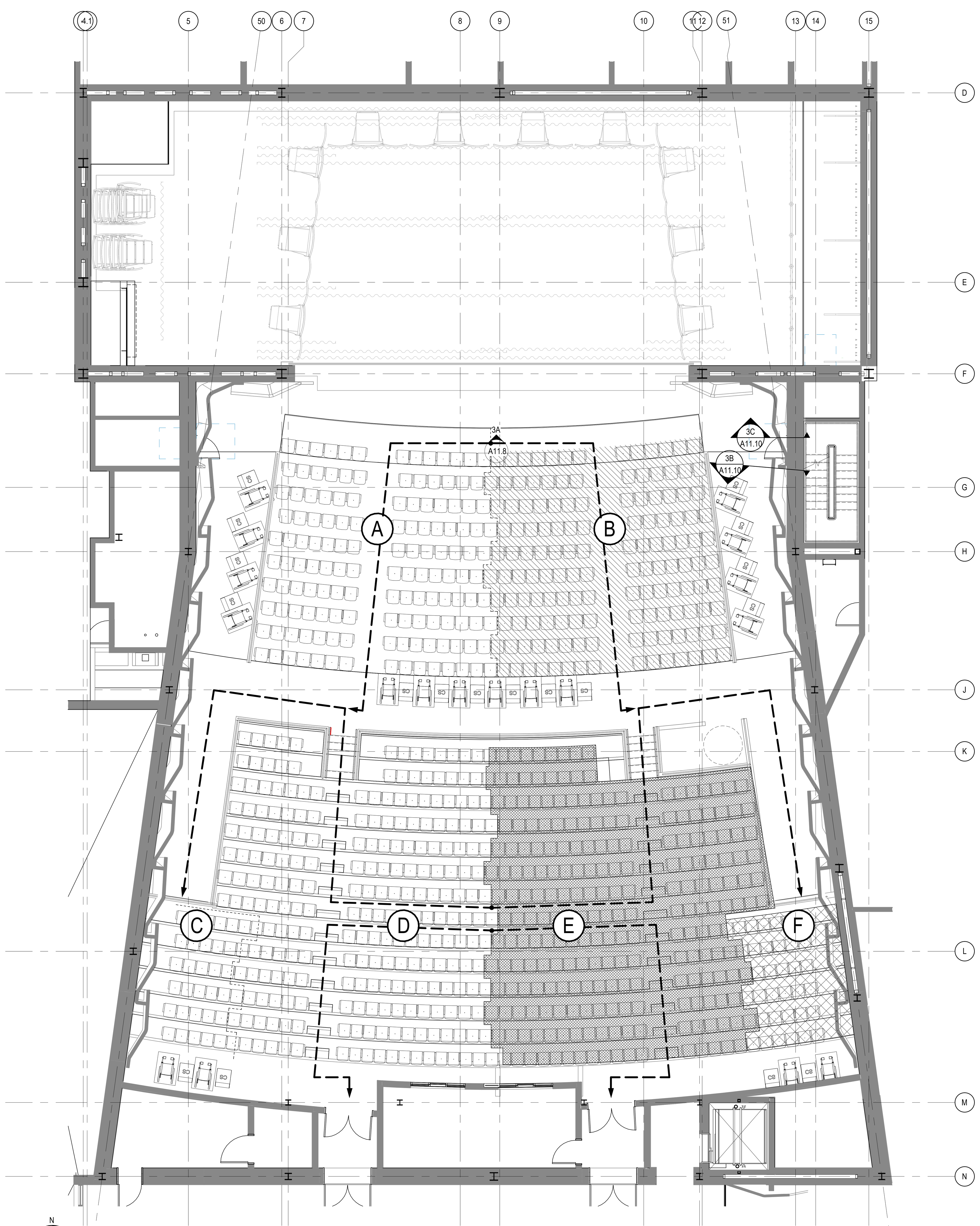
G0.1

SEE FIRE PROTECTION DRAWINGS FOR STANDPIPE LOCATIONS

FIRE EXTINGUISHER CABINETS

FEC-2 RECESSED FIRE EXTINGUISHER CABINET

SEE CP1.1 AND CP1.2 FOR CODE PLAN
SEE CP1.1 AND CP1.2 EGRESS DOORS AND PATHS
SEE A2.1 FOR SEATING INFORMATION



LEVEL 03 - CODE PLAN - CATCHMENT ZONES

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

AUDIENCE CHAMBER SEATING

TOTAL SEATS PROVIDED:	816	
ACCESSIBLE SEAT POSITIONS:	09 REQUIRED 18 PROVIDED	("501 TO 5000" CATEGORY, PER IBC TABLE 1109.2.2.1)
COMPANION SEATS:	09 REQUIRED 18 PROVIDED	
DESIGNATED AISLE SEATS:	05 REQUIRED 06 PROVIDED	(5% OF 89 = 5 REQUIRED)

CLEAR WIDTH OF AISLE ACCESSWAYS:

COMPLYING WITH IBC SECTION 1030.13.2, REQUIRED CLEAR WIDTHS OF AISLE ACCESSWAYS ARE PROVIDED (MEASURED AS THE CLEAR HORIZONTAL DISTANCE FROM THE BACK OF THE ROW AHEAD AND THE NEAREST PROJECTION OF THE ROW BEHIND). REFER TO ENLARGED LIFE SAFETY PLANS AND DETAILS ON CP1.1 AND CP1.2.

PER 1030.13.2.1 FOR DUAL ACCESS ROWS: FOR ROWS OF SEATING SERVED BY AISLES OR DOORWAYS AT BOTH ENDS, THERE SHALL BE NOT MORE THAN 100 SEATS PER ROW. THE MINIMUM CLEAR WIDTH OF 12 INCHES BETWEEN ROWS SHALL BE INCREASED BY 0.3 INCH FOR EVERY ADDITIONAL SEAT BEYOND 14 SEATS. THE MINIMUM CLEAR WIDTH IS NOT REQUIRED TO EXCEED 22 INCHES.

PER 1030.13.2.2 FOR SINGLE ACCESS ROWS: FOR ROWS OF SEATING SERVED BY AN AISLE OR DOORWAY AT ONLY ONE END OF THE ROW, THE MINIMUM CLEAR WIDTH OF 12 INCHES BETWEEN ROWS SHALL BE INCREASED BY 0.6 INCH FOR EVERY ADDITIONAL SEAT BEYOND SEVEN SEATS. THE MINIMUM CLEAR WIDTH IS NOT REQUIRED TO EXCEED 22 INCHES.

LEVEL 01: MAX. NUMBER OF SEATS AT A DUAL ACCESS ROW = 14.
16 - 14 = 2
2 * 0.3 INCH = 0.6 + 12 = 12.6 INCHES (REQ'D CLEAR WIDTH OF AISLE ACCESSWAY)
GREATER THAN 13 INCHES PROVIDED. SEE DETAIL 2/CP1.3.

LEVEL 01: MAX. NUMBER OF SEATS AT A SINGLE ACCESS ROW = 7.
7 - 7 = 0
12 INCHES (REQ'D CLEAR WIDTH OF AISLE ACCESSWAY)
GREATER THAN 12 INCHES PROVIDED. SEE DETAIL 2/CP1.3.

LEVEL 02: MAX. NUMBER OF SEATS AT A DUAL ACCESS ROW = 24.
24 - 14 = 10
10 * 0.3 INCH = 3 + 12 = 15 INCHES (NOT REQUIRED TO EXCEED 22 INCHES)
15 INCHES = REQ'D CLEAR WIDTH OF AISLE ACCESSWAY
GREATER THAN 15 INCHES PROVIDED. SEE DETAIL 2/CP1.3.

LEVEL 02: MAX. NUMBER OF SEATS AT A SINGLE ACCESS ROW = 7.
7 - 7 = 0
12 INCHES = REQ'D CLEAR WIDTH OF AISLE ACCESSWAY)
GREATER THAN 12 INCHES PROVIDED. SEE DETAIL 2/CP1.3.

ASSISTED LISTENING SYSTEMS:

ASSISTED LISTENING SYSTEM PROVIDED. SEE SHEET TA-613. LISTENING DEVICES WILL BE AVAILABLE AT THE CONCIERGE DESK.

NUMBER OF DEVICES REQUIRED PER IBC - CHAPTER 1109.2.7.1:
TOTAL NUMBER OF SEATS: 814
20 DEVICES PLUS 1 PER 33 SEATS OVER 500 SEATS OF SEATS REQUIRED FOR ASSISTED LISTENING DEVICES - REQUIRED: 30 PROVIDED: 30

1 PER 4 OF ALD'S REQUIRED TO BE HEARING AID COMPATIBLE - REQUIRED: 08 PROVIDED: 08

SEATING TYPE GRAPHIC LEGEND

ACCESSIBLE SEAT POSITION, COMPLYING W/ IBC SECTION 1109.2.2.

CS — COMPANION SEATS, COMPLYING W/ IBC SECTION 1109.2.3. AT LEAST ONE COMPANION SEAT COMPLYING WITH SECTION 1109.2.3 SHALL BE PROVIDED IMMEDIATELY ADJACENT TO EACH WHEELCHAIR SPACE REQUIRED BY SECTION 1109.2.2.

DA — DESIGNATED AISLE SEATS, COMPLYING W/ IBC SECTION 1109.2.5. AT LEAST 5 PERCENT OF THE TOTAL NUMBER OF AISLE SEATS PROVIDED SHALL COMPLY W/ SECTION 1109.2.5 AND SHALL BE THE AISLE SEATS LOCATED CLOSEST TO ACCESSIBLE ROUTES.

CATCHMENT LEGEND

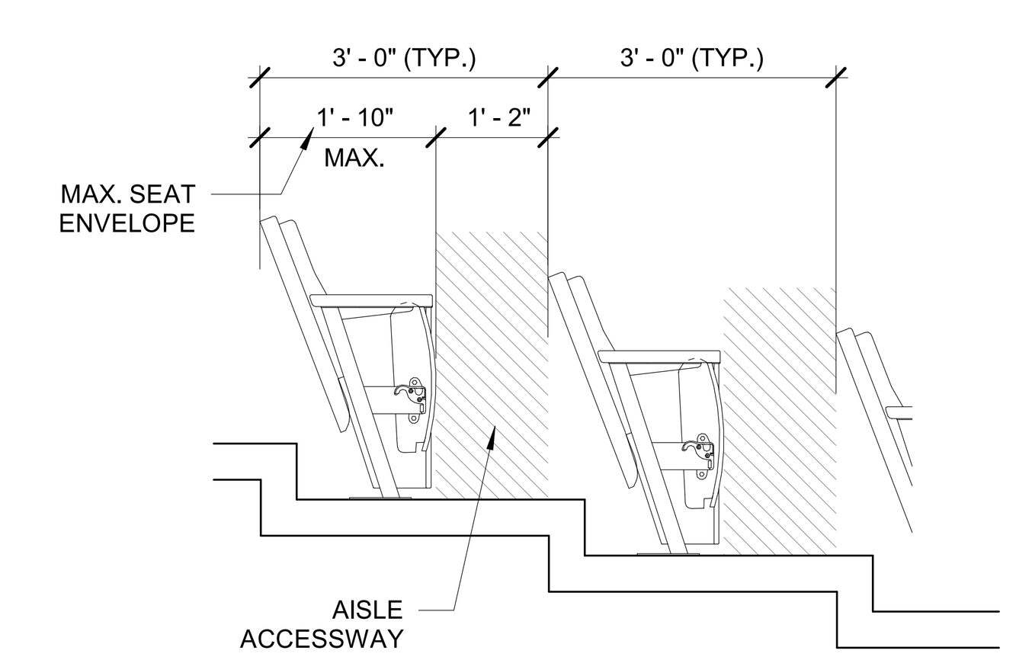
AUDIENCE CHAMBER CATCHMENT ZONE OCCUPANCY NUMBERS

- A 140 OCCUPANTS
- B 140 OCCUPANTS
- C 34 OCCUPANTS
- D 237 OCCUPANTS
- E 230 OCCUPANTS
- F 35 OCCUPANTS

THEATRICAL SEATING SCHEDULE

Type	Angle	Count
(CS) Companion Seat		18
(DA) DESIGNATED AISLE - 20"	20.00°	4
(DA) DESIGNATED AISLE - 21"	20.00°	1
(DA) DESIGNATED AISLE - 22"	20.00°	1
(WC) Accessible Seat		18
FIXED SEATING - 19"	16.00°	230
FIXED SEATING - 20"	20.00°	125
FIXED SEATING - 20"	16.00°	250
FIXED SEATING - 21"	20.00°	96
FIXED SEATING - 21"	16.00°	39
FIXED SEATING - 22"	20.00°	53
FIXED SEATING - 22"	16.00°	18
Grand total		853

FIXED THEATRICAL SEATING BASIS OF DESIGN -
WENGER CAVEA - FABRIC SEAT BOTTOMS AND BACKS W/ WOOD VENER.



21 DEGREE ANGLED SEAT

2/CP1.3 CLEAR AISLE ACCESSWAY WIDTHS

SCALE: 1/2" = 1'-0"

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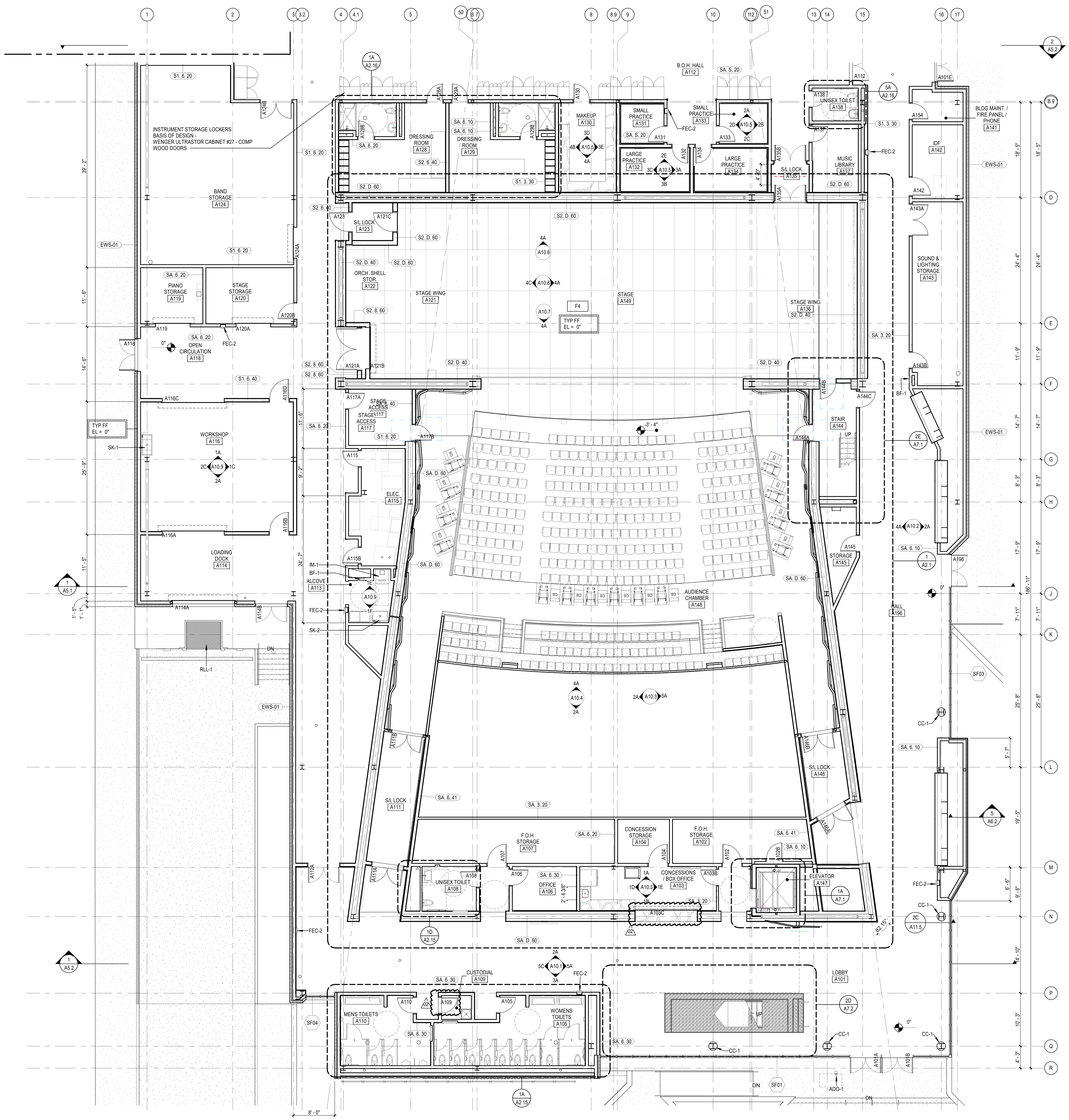
AUDIENCE CHAMBER CATCHMENT ZONES

CP1.3



LEVEL 01 - AREA A - FLOOR PLAN

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

GENERAL ARCHITECTURAL NOTES

1. PARTITION TYPES SHALL BE DESIGNATED ON FLOOR PLANS (XX. X. XX) THUS: SEE SHEET A8.3 FOR TYPES. ALL INTERIOR PARTITIONS ARE TYPE SA.3.20 UNLESS NOTED OTHERWISE.
2. ALL MASONRY WALLS AND INTERIOR STUD WALLS SHALL EXTEND TO UNDERSIDE OF FLOOR OR ROOF DECK ABOVE UNLESS NOTED OTHERWISE, PER PARTITION TYPE.
3. PROVISIONS SHALL BE MADE AT ALL FULL HEIGHT NON-BEARING WALLS FOR 1-INCH VERTICAL MOVEMENT OF THE BUILDING STRUCTURE WITHOUT TRANSFER OF COMPRESSIVE LOADS TO WALL. FILL IRREGULARITIES BETWEEN TOP OF WALL AND DECK ABOVE WITH MINERAL WOOL INSULATION OR FIRE STOPPING MATERIALS AS REQUIRED TO MEET FIRE RATING OF RESPECTIVE WALLS. SEE DETAILS ON SHEET XX.X.
4. SEE STRUCTURAL DRAWINGS FOR BRACING OF NON-LOAD BEARING MASONRY WALLS.
5. FURNISH AND INSTALL FIRE-TREATED WOOD BLOCKING OR METAL BACKING PLATE IN METAL STUD PARTITIONS FOR THE PROPER ANCHORAGE OF ALL WALL ATTACHED ITEMS; I.E. TOILET ACCESSORIES, CASEWORK, MILLWORK, WALL-MOUNTED FIXTURES, MARKER BOARDS, TACK BOARDS, DOOR STOPS, AUDIO VISUAL BRACKETS, AND OTHER WALL ATTACHED ITEMS.
6. GYPSUM BOARD SURFACES SHALL BE ISOLATED WITH CONTROL JOINTS WHERE SHOWN ON DRAWINGS AND AS DESCRIBED IN THE SPECIFICATIONS.
7. MASONRY CONTROL JOINTS (CJ) AND CONTROL JOINTS ABOVE (CJA) SHALL BE LOCATED AS SHOWN ON THE FLOOR PLAN AND BUILDING ELEVATIONS, AND WHERE LARGE PLUMBING VENTS OR RISERS OCCUR IN SINGLE WYTHE MASONRY WALLS, AND WHERE MASONRY WALLS BEARING ON THE CONCRETE FLOOR SLAB ABUT MASONRY WALLS BEARING ON CONCRETE FOOTINGS OR AS INDICATED ON DRAWINGS.
8. EXTEND FURRING CHANNELS AND GYPSUM BOARD UP 4 INCHES ABOVE FINISHED CEILING ON CMU WALLS.
9. SCRIBE GYPSUM WALL BOARD OF WALLS AND PARTITIONS TO IRREGULARITIES OF DECK ABOVE. SEAL TIGHTLY AROUND ALL PENETRATIONS.

REFERENCE KEYNOTES

ADO-1	ACCESSIBLE DOOR OPERATOR
BF-1	BOTTLE FILLER
CC-1	COLUMN COVER, SNAP TOGETHER
FEC-2	FIRE EXTINGUISHER CABINET RECESSED
IM-1	ICE MACHINE
RLL-1	RECESSED DOCK LEVELER, 5,000 LBS. CAPACITY
SK-1	
SK-2	

1 EXISTING WALL COVERING IN-WALL UTILITIES TO REMAIN, NEW WALLS TO TIE IN.
2 EXISTING WALL INFILL

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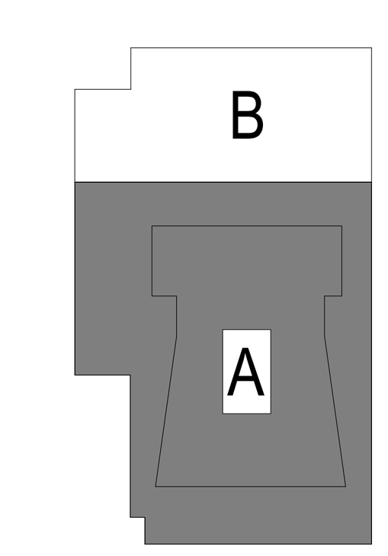
KEY PLAN



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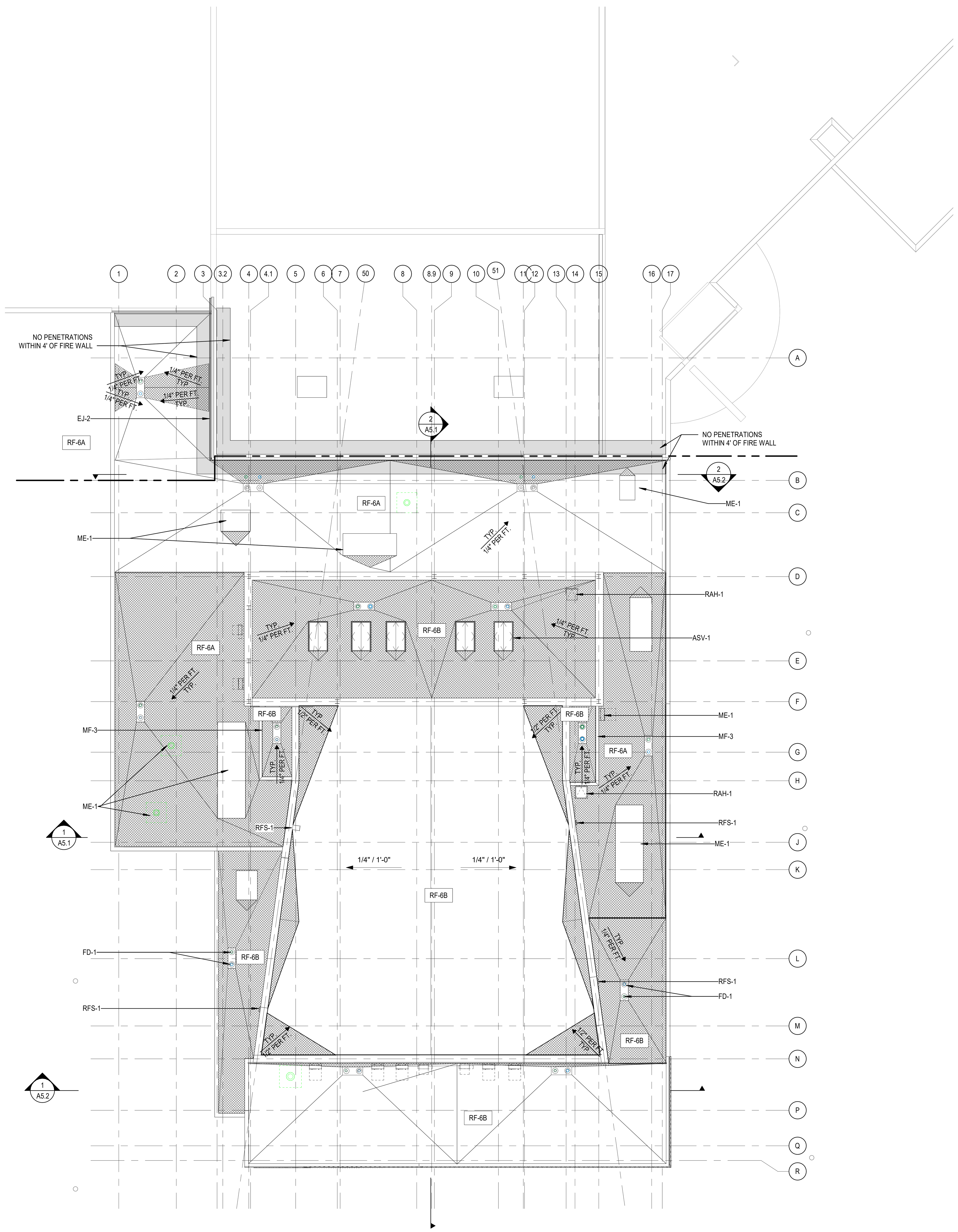
LEVEL 01 - AREA A - FLOOR PLAN

A1.1A



OVERALL ROOF PLAN

SCALE: 1/16" = 1'-0"

STAGEHOUSE SMOKE VENT INFORMATION:
- STAGE AREA: 3,508 SF
- 5% TOTAL AREA REQUIRED: .05 X 3508 SF = 175.4 SF PER IBC 410.2.7 ROOF VENTS
  5 X 40 SF ROOF VENT OPENINGS = 200 SF TOTAL ROOF VENT OPENING

ROOF PLAN GENERAL NOTES

A. ROOF PLAN GENERAL NOTES APPLY TO ALL ROOF PLAN SHEETS.
B. ROOF SLOPES ARE CREATED BY SLOPING THE ROOF STRUCTURE UNLESS NOTED OTHERWISE. SEE STRUCTURAL DRAWINGS FOR ELEVATIONS OF THE HIGH AND LOW POINTS TO DETERMINE PROPER TAPER IN INSULATION.
C. TAPERED INSULATION SHALL PROVIDE A MINIMUM OF 1/4-INCH PER FOOT OF SLOPE TO ROOF DRAINS, UNLESS NOTED OTHERWISE.
D. AREAS MARKED WITH A HATCHED PATTERN INDICATE TAPERED INSULATION.
E. ALL ROOF CURBS TO BE A MINIMUM OF 12 INCHES ABOVE ROOFING LEVELS. PROVIDE TAPERED INSULATION ROOF SADDLES AT ROOF CURBS TO PROVIDE DRAINAGE AROUND CURB.
F. SEE STRUCTURAL DRAWINGS FOR FRAMING AROUND ROOF PENETRATIONS.
G. COORDINATE THE SIZE AND LOCATION OF ROOF PENETRATIONS FOR MECHANICAL AND ELECTRICAL EQUIPMENT. REFER TO MECHANICAL AND ELECTRICAL DRAWINGS FOR PENETRATIONS NOT SHOWN ON THIS DRAWING.
H. FLASH DRAINS, CURBS, VENTS AND STACKS PER MANUFACTURER'S RECOMMENDATIONS IF DETAIL NOT SHOWN ON DRAWINGS.
I. NO ROOF PENETRATIONS ALLOWED WITHIN 4'-0" EACH SIDE OF FIREWALL. SEE CODE PLAN FOR FIRE WALL LOCATIONS.

REFERENCE KEYNOTES

ASV-1	AUTOMATIC SMOKE VENT
EJ-2	EXPANSION JOINT COVER TYPE 2
FD-1	METAL ROOF DRAIN
ME-1	MECHANICAL EQUIPMENT
MF-3	PREFINISHED SHEET METAL PARAPET CAP W/ CONT CLEAT
RAH-1	ROOF ACCESS HATCH
RFS-1	ROOF SCUPPER

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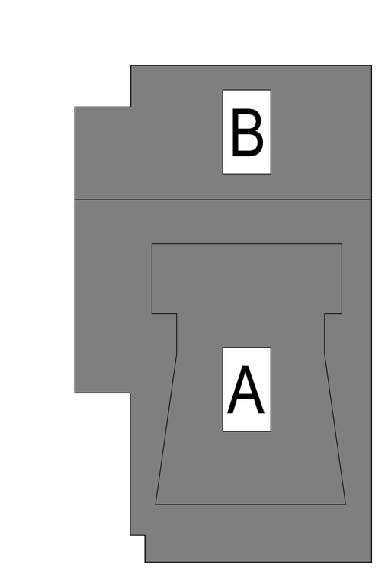
KEY PLAN



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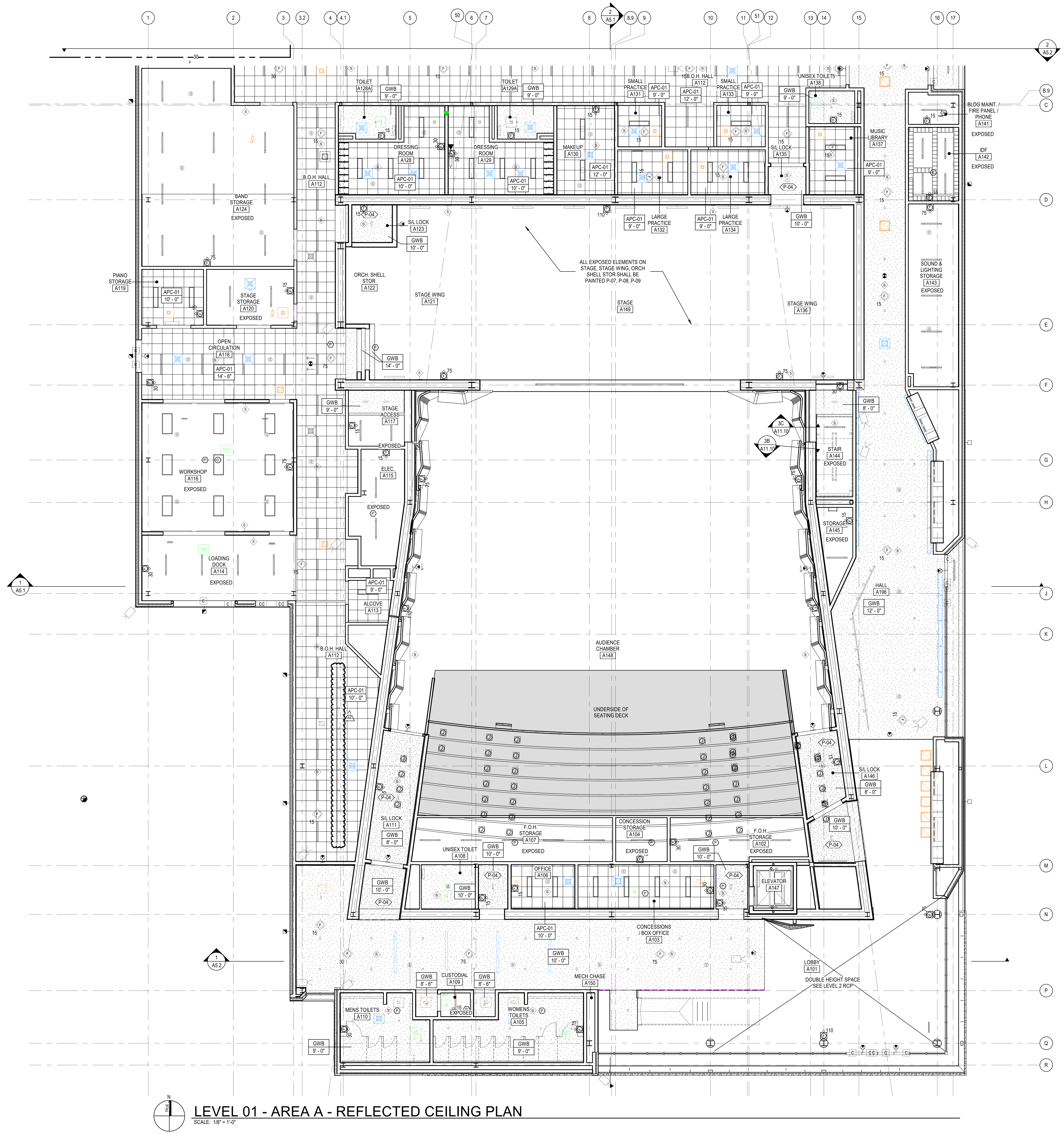
OVERALL ROOF PLAN
A1.4



LEVEL 01 - AREA A - REFLECTED CEILING PLAN

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

REFLECTED CEILING PLAN GENERAL NOTES

A. REFLECTED CEILING PLAN GENERAL NOTES APPLY TO ALL REFLECTED CEILING PLAN SHEETS.
B. ALL CEILING GRIDS/PANELS SHALL BE CENTERED IN EACH ROOM UNLESS NOTED OTHERWISE.
C. CEILING HEIGHTS ARE NOTED ON THE REFLECTED CEILING PLANS ARE MEASURED FROM THE FINISH FLOOR OF THE ROOM.
D. ALL ELECTRICAL FIXTURES, SPEAKERS, SMOKE AND THERMAL DETECTORS, MECHANICAL GRILLES, SPRINKLER HEADS, AND OTHER CEILING MOUNTED DEVICES, SHALL BE CENTERED BETWEEN CEILING GRIDS UNLESS NOTED OTHERWISE. SPRINKLER HEADS SHALL BE WITHIN A 3-INCH RADIUS CENTERED BETWEEN CEILING GRIDS.
E. IN ACOUSTICAL CEILING PANELS WITH SCORE IN THE CENTER, CENTER DEVICES REFERENCE IN NOTE D IN ONE HALF OF THE TILE. DO NOT LOCATE ON THE SCORE. FOR ACP WITH MULTIPLE SCORED PATTERNS, COORDINATE LOCATION WITH THE ARCHITECT.
F. PROVIDE SUSPENSION SYSTEM AROUND ELECTRICAL FIXTURES, MECHANICAL GRILLES, DIFFUSERS, AND OTHER CEILING MOUNTED DEVICES. AT ACOUSTICAL PANEL CEILINGS.
G. ALL DIMENSIONS ON REFLECTED CEILING PLANS ARE ACTUAL AND ARE TO THE FOLLOWING UNLESS NOTED OTHERWISE:
   a. FACE OF FINISHED WALL
   b. FACE OF FINISHED BULKHEADS
   c. CENTERLINE OF COLUMNS
   d. CENTERLINE OF TEES
H. IN AREAS WITH EXPOSED STRUCTURE CEILINGS, COORDINATE EXACT LOCATIONS OF MECHANICAL GRILLES, DIFFUSERS, DUCTWORK AND ELECTRICAL FIXTURES WITH EACH REPRESENTATIVE SUBCONTRACTOR.
I. IN AREAS WITH EXPOSED STRUCTURE CEILINGS, ALL STRUCTURE, DUCTS, PIPES, CONDUIT TO BE PAINTED.
J. ALL WALLS EXTEND TO UNDERSIDE OF DECK EXCEPT THOSE SHOWN SHADED IN WHICH GYPSUM BOARD OR MASONRY EXTENDS MIN 4 INCHES ABOVE FINISHED CEILING. ALL METAL STUDS EXTEND TO UNDERSIDE OF FLOOR OR ROOF DECK.

REFERENCE KEYNOTES

SHEET NOTES

1 DEMOLISH EXISTING LAY IN CEILING
2 DEMOLISH EXISTING LIGHT FIXTURES
3 DEMOLISH EXISTING ACOUSTICAL PANELS

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KEY PLAN

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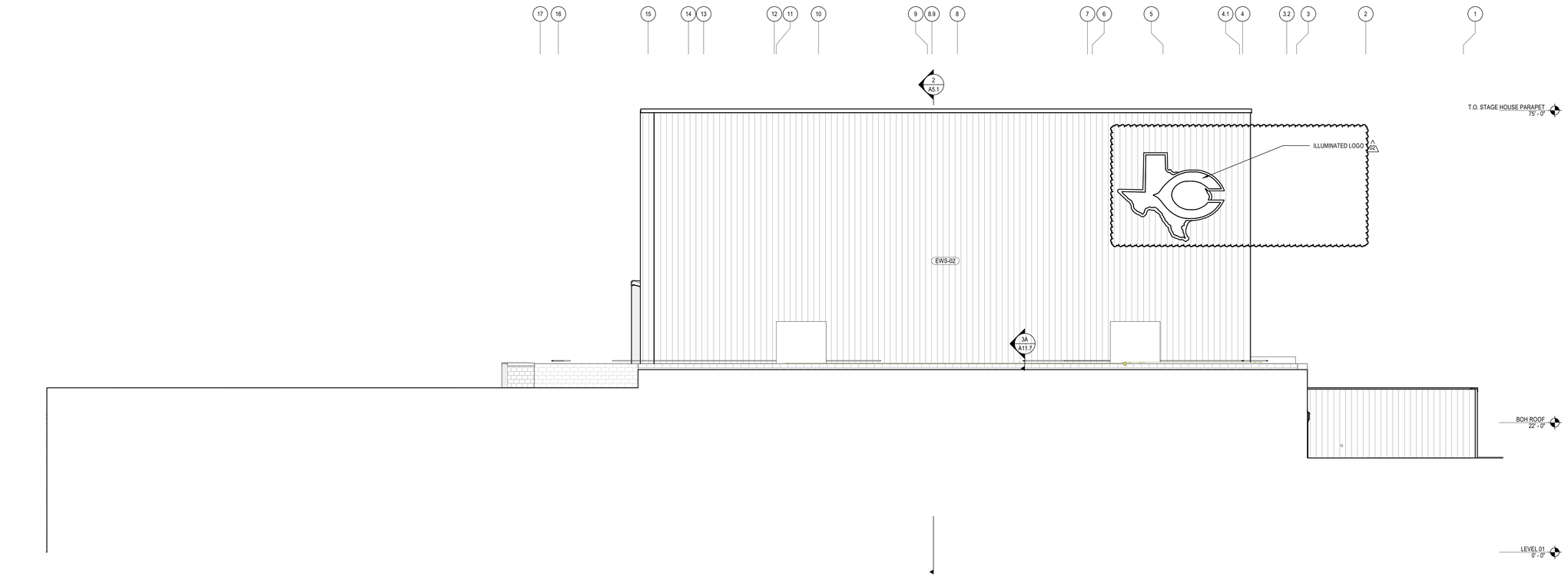
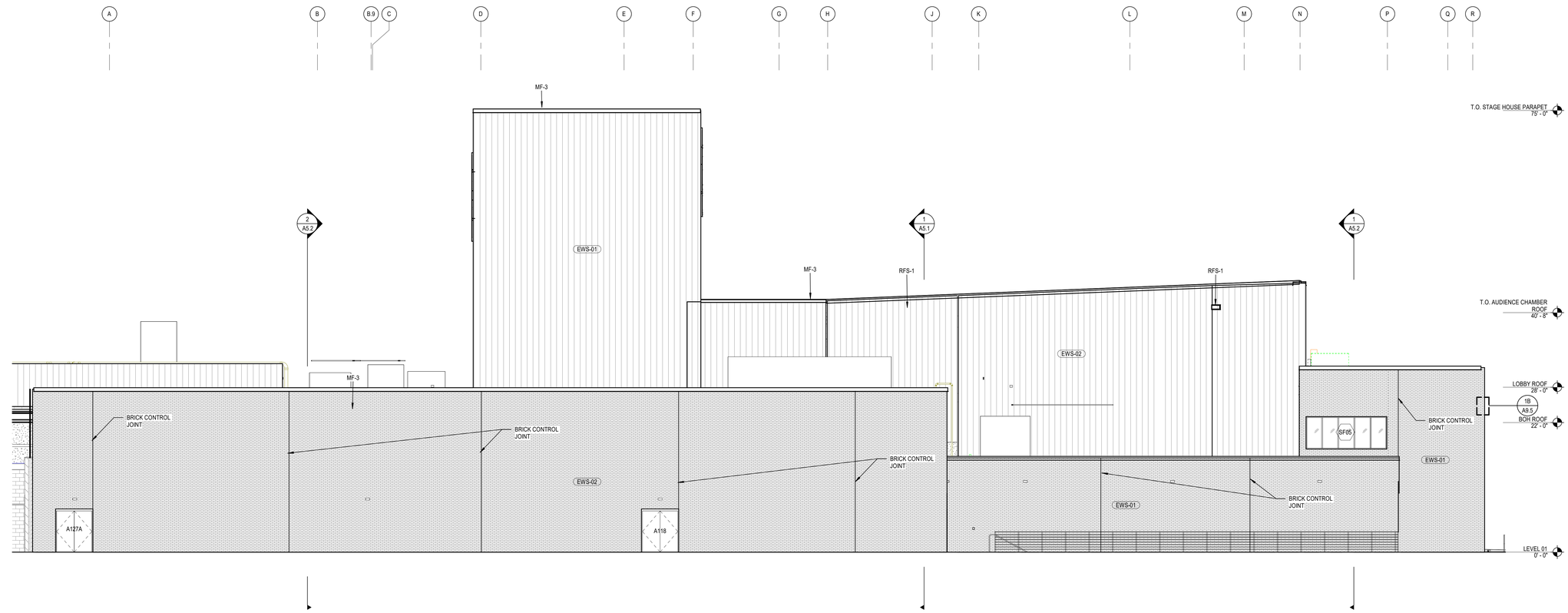
LEVEL 01 - AREA A - REFLECTED CEILING PLAN

A3.1A



3A A4.1 NORTH BUILDING ELEVAION

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



01 5A A4.1 WEST BUILDNIG ELEVATION

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

REFERENCE KEYNOTES

MF-3	PREFINISHED SHEET METAL PARAPET CAP W/ CONT CLEAT
RFS-1	ROOF SCUPPER

DLR GROUP

REGISTERED ARCHITECT STATE OF TEXAS CHARLES E. BRYANT

CRANDALL ISD HIGH SCHOOL

PAC ADDITION

13385 Fm 3039, Crandall, TX 75114

ISSUE FOR BID AND PERMIT

2024.07.25

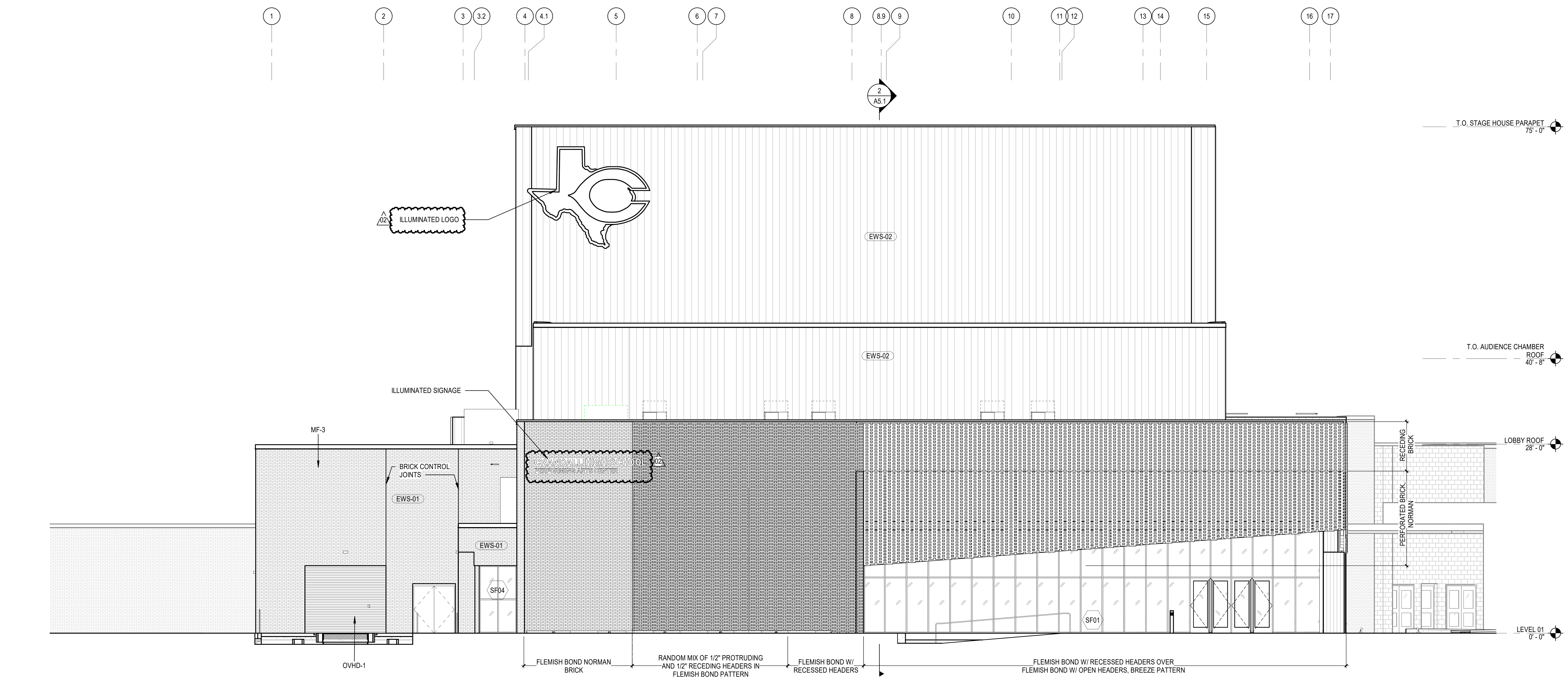
REVISIONS

01	08/19/24	ADDENDUM 01
02	09/03/24	ADDENDUM 02

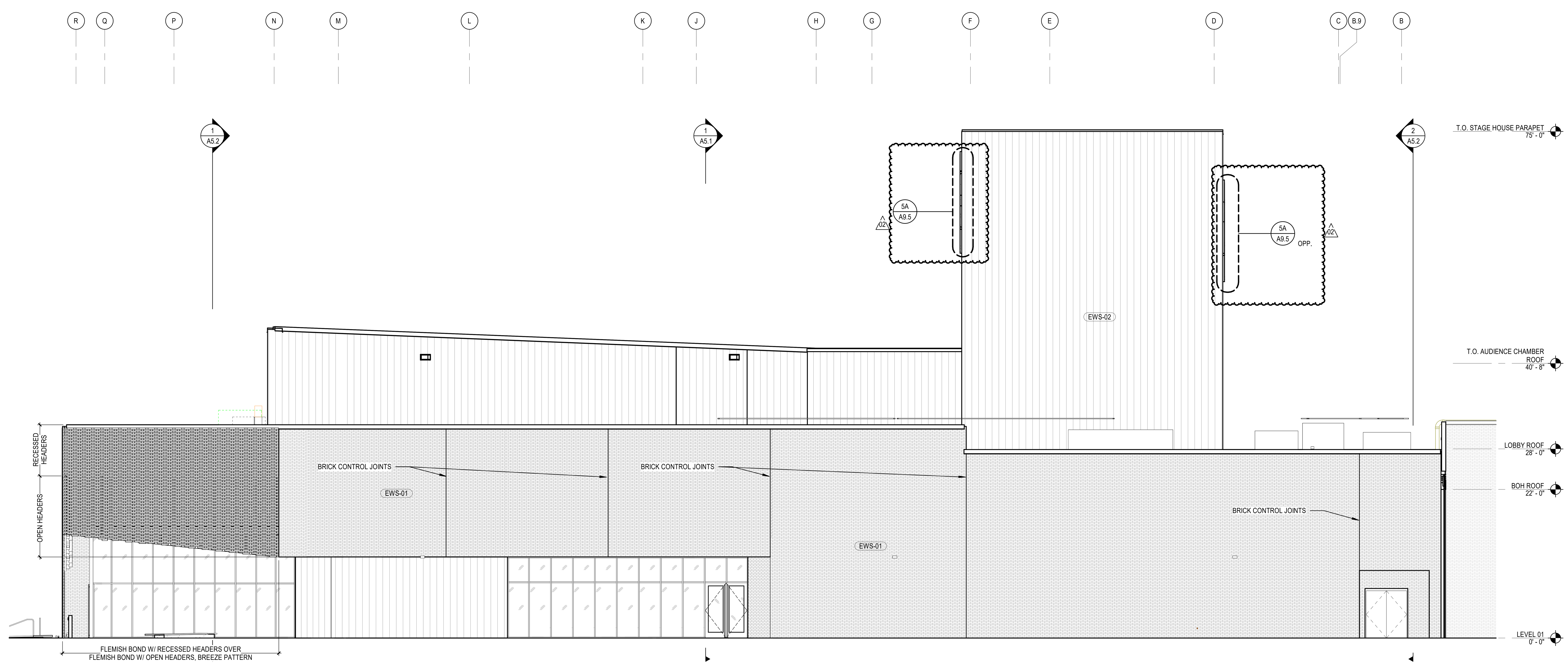
39-23712-00

EXTERIOR ELEVATIONS

A4.1



3A A4.2 SOUTH BUILDING ELEVATION
SCALE: 1/8" = 1'-0"



5A A4.2 EAST BUILDING ELEVATION
SCALE: 1/8" = 1'-0"

REFERENCE KEYNOTES

MF-3	PREFINISHED SHEET METAL PARAPET CAP W/ CONT CLEAT
OVHD-1	OVERHEAD COILING DOOR

DLRGROUP

CRANDALL ISD HIGH SCHOOL
PAC ADDITION
13385 Fm 3039, Crandall, TX 75114

ISSUE FOR BID AND PERMIT
2024.07.25
REVISIONS

01	08/19/24	ADDENDUM 01
02	09/03/24	ADDENDUM 02

39-23712-00

EXTERIOR ELEVATIONS

A4.2

Autodesk Docs://39-23712-00 Crandall ISD - PAC/39-23712-00_Crandall ISD_AR_2024.rvt
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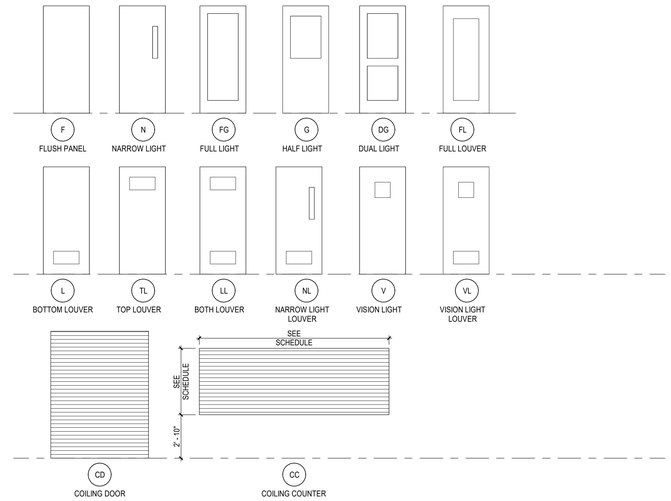
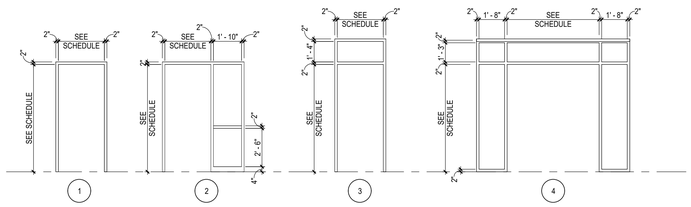
DOOR AND FRAME SCHEDULE

NUMBER	PANEL: NO. OF PANELS	PANEL: WIDTH	PANEL: HEIGHT	PANEL: THICKNESS	PANEL: MATERIAL	PANEL: GLASS	PANEL: TYPE	FRAME: MATERIAL	FRAME: TYPE	FIRE RATING	Door STC Rating	Door Gasket Type	AAOS Shared HW Set	DETAILS: HEAD	DETAILS: JAMB LEFT	DETAILS: JAMB RIGHT	DETAILS: SILL	Comments	Door Security	KICK PLATE
LEVEL 01																				
A101A	2	2' - 11 79/128"	8' - 2"	1 3/4"	ALUM	TIG	DG	ALUM		-			3.0						Yes	NO
A101B	2	3' - 0"	8' - 2"	1 3/4"	ALUM	TIG	DG	ALUM		-			1.0						Yes	NO
A101C	2	3' - 0"	7' - 0"	1 3/4"	HM	TIG	DG	HM	1	90 MIN			32.0						No	YES
A101E	2	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	-			6.0							NO
A102	1	3' - 8"	7' - 0"	1 3/4"	HM		F	HM	1	-			18.0						No	YES
A102B	1	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	-			12.0						No	NO
A103B	1	3' - 0"	7' - 0"	1 3/4"	HM	TIG	N	HM	1	-			19.0						No	NO
A103C	1	12' - 0"	4' - 0"	0"	STL		CC	*Interior - Black Paint		-			55.0					LOCKABLE WHEN NOT IN USE ON INTERIOR SIDE OF ROOM A103	No	-
A104	1	3' - 8"	7' - 0"	1 3/4"	HM		F	HM	1	-			18.0						No	YES
A105	1	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	-			52.0						No	YES
A106	1	3' - 0"	7' - 0"	1 3/4"	HM	CTG	N	HM	1	-			46.0						No	NO
A107	1	3' - 8"	7' - 0"	1 3/4"	HM		F	HM	1	-			18.0						No	YES
A108	1	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	-			41.0						No	NO
A109	1	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	-			10.0						No	NO
A110	1	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	-			52.0						No	YES
A111A	2	3' - 0"	7' - 0"	1 3/4"	HM - P06		F	HM - P06	1	-		G1	30.0						No	NO
A111B	2	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	-			54.0						No	NO
A112	2	3' - 0"	7' - 0"	1 3/4"	HM	CTG	DG	HM	1	-			33.0						No	YES
A112A	2	3' - 0"	7' - 0"	1 3/4"	HM	CTG	DG	HM	1	-			35.0						Yes	NO
A114A		12' - 0"	10' - 0"		STL		CD	Steel, Paint Finish, Dark Gray, Matte		-			55.0						No	-
A114B	2	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	-			4.0						Yes	YES
A115	1	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	45 MIN			25.0						No	NO
A115B	1	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	45 MIN			25.0						No	NO
A116A		12' - 0"	10' - 0"		STL		CD	Steel, Paint Finish, Dark Gray, Matte		45 MIN			55.0						No	-
A116B	1	3' - 8"	7' - 0"	1 3/4"	HM		F	HM	1	45 MIN			21.0						No	YES
A116C		12' - 0"	14' - 0"		STL		CD	Steel, Paint Finish, Dark Gray, Matte		45 MIN			55.0						No	-
A116D	1	3' - 8"	7' - 0"	1 3/4"	HM		F	HM	1	45 MIN			22.0						No	YES
A117A	1	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	45 MIN		G1	13.0						No	YES
A117B	1	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	-			7.0						No	YES
A118	2	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	-		G1	5.0					EXIT ONLY - NO EXTERIOR HARDWARE		YES
A119		6' - 8"	8' - 0"		STL		CD	STL		-			55.0						No	-
A120A		6' - 8"	8' - 0"		STL		CD	STL		-			55.0						No	-
A120B	1	3' - 0"	7' - 0"	1 3/4"	HM	CTG	N	HM	1	-			11.0						No	YES
A121A	2	4' - 0"	9' - 0"	1 3/4"	HM		F	ALUM	1	-	STC 51		36.0						No	YES
A121B		6' - 0"	14' - 0"		STL		CD	STL		90 MIN			55.0						No	-
A121C	1	3' - 8"	7' - 0"	1 3/4"	HM		F	HM	1	-			48.0						No	YES
A123	1	3' - 8"	7' - 0"	1 3/4"	HM		F	HM	1	90 MIN		G1	26.0						No	YES
A124A		6' - 0"	8' - 0"		STL		CD	STL		45 MIN			55.0						No	-
A124B	2	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	45 MIN			23.0						No	YES
A125	2	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	45 MIN			23.0						No	YES
A126	1	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	-			11.0						No	YES
A127	2	3' - 0"	7' - 0"	1 3/4"	HM	CTG	DG	HM	1	-			33.0						No	YES
A127A	2	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	-			4.0							YES
A127B	2	3' - 0"	7' - 0"	1 3/4"	HM	TIG	DG	HM	1	90 MIN			34.0						No	YES
A128A	1	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	45 MIN			43.0						No	NO
A128B	1	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	-			42.0						No	NO
A129A	1	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	45 MIN			43.0						No	NO
A129B	1	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	-			42.0						No	NO
A130	1	3' - 0"	7' - 0"	1 3/4"	HM	TIG	N	HM	1	45 MIN			43.0						No	NO
A131	1	3' - 0"	7' - 0"	1 3/4"	HM	TIG	N	HM	1	45 MIN		G2	9.0						No	YES
A132	1	3' - 0"	7' - 0"	1 3/4"	HM	TIG	N	HM	1	45 MIN		G2	15.0						No	YES
A133	1	3' - 0"	7' - 0"	1 3/4"	HM	TIG	N	HM	1	45 MIN		G2	15.0						No	YES
A134	1	3' - 0"	7' - 0"	1 3/4"	HM	TIG	N	HM	1	45 MIN		G2	15.0						No	YES
A135A	2	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	-			53.0							YES
A135B	2	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	90 MIN		G1	31.0							YES
A137	1	3' - 0"	7' - 0"	1 3/4"	HM	TIG	N	HM	1	45 MIN		G2	14.0						No	NO
A138	1	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	-			42.0						No	NO
A139	1	3' - 0"	7' - 0"	1 3/4"	HM	CTG	N	HM	1	-			44.0						No	NO
A140	1	3' - 0"	7' - 0"	1 3/4"	HM	CTG	N	HM	1	-			47.0						No	NO
A142	1	3' - 6"	7' - 0"	1 3/4"	HM		F	HM	1	-			57.0						Yes	NO
A143A	2	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	-			24.0						No	YES
A143B	1	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	-			10.0						No	NO
A144A	1	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	-			51.0						No	YES
A144B	1	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	90 MIN			40.0						No	YES
A144C	1	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	-		G1	50.0						No	YES
A145	1	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	-			10.0						No	NO
A146A	2	3' - 0"	7' - 0"	1 3/4"	HM - P06		F	HM - P06	1	-		G1	30.0						No	NO
A146B	2	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	-			54.0						No	NO
A154	1	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	-			10.0						No	NO
A196	2	3' - 1 7/256"	8' - 2"	1 3/4"	ALUM	TIG	DG	ALUM		-			2.0					EXIT ONLY - NO EXTERIOR HARDWARE	No	NO
E100A	2	3' - 0"	7' - 0"	1 3/4"	HM	FRG	N	HM	1	-		G1	29.0							YES
E100B	2	3' - 0"	7' - 0"	1 3/4"	HM	FRG	N	HM	1	90 MIN		G2	29.0							YES
E100C	2	3' - 0"	7' - 0"	1 3/4"	HM	FRG	N	HM	1	90 MIN		G2	29.0							YES
E100D	2	3' - 0"	7' - 0"	1 3/4"	HM	FRG	N	HM	1	-		G2	37.0							YES
E101	1	3' - 0"	7' - 0"	1 3/4"	HM	FRG	N	HM	1	-		G1	28.0						No	NO
E102A	1	3' - 0"	7' - 0"	1 3/4"	HM	FRG	N	HM	1	-		G1	45.0						No	NO
E102B	1	3' - 0"	7' - 0"	1 3/4"	HM	FRG	N	HM	1	-		G1	45.0						No	NO
E103	1	3' - 0"	7' - 0"	1 3/4"	HM	FRG	N	HM	1	-		G1	45.0						No	NO
E104	1	3' - 0"	7' - 0"	1 3/4"	HM	FRG	N	HM	1	-		G2	28.0						No	NO
E106A	2	3' - 0"	7' - 0"	1 3/4"	HM	FRG	N	HM	1	90 MIN		G2	29.0							YES
E106B	1	3' - 0"	7' - 0"	1 3/4"	HM	FRG	N	HM	1	90 MIN		G2	27.0						Yes	YES
E106C	2	3' - 0"	7' - 0"	1 3/4"	HM	FRG	N	HM	1	90 MIN		G1	29.0							YES
MEZZANINE 02																				
A202	1	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	-			52.0						No	YES
A203	1	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	-			10.0						No	NO
A204	1	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	-			52.0						No	YES
A205	1	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	-			39.0						No	YES
A205A	1	3' - 6"	7' - 0"	1 3/4"	HM		F	HM	1	-			56.0						Yes	NO
A206A	2	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	-		G1	30.0						No	NO
A206B	2	3' - 0"	7' - 0"	1 3/4"	HM - P06		F	HM - P06	1	-			54.0						No	NO
A207	1	3' - 0"	7' - 0"	1 3/4"	HM - P06		F	HM - P06	1	-		G1	17.0						No	YES
A208A	2	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	-		G1	30.0						No	NO
A208B	2	3' - 0"	7' - 0"	1 3/4"	HM - P06		F	HM - P06	1	-			54.0						No	NO
CATWALK LEVEL 03																				
A300	1	3' - 0"	7' - 0"	1 3/4"	HM - P05		F	HM - P05	1	-			19.0							NO
A300A	2	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	-			38.0						No	NO
A301A	1	3' - 0"	7' - 0"	1 3/4"	HM - P05		F	HM - P05	1	-		G1	16.0							NO
A302A	1	3' - 0"	7' - 0"	1 3/4"	HM	CTG	N	HM	1	-			20.0						No	NO
A302B	1	3' - 0"	7' - 0"	1 3/4"	HM		F	HM	1	-			16.0						No	NO
A303	1	3' - 0"	7' - 0"	1 3/4"	HM - P05		F	HM - P05	1	-			19.0							NO
A304	1	3' - 0"	7' - 0"	1 3/4"	HM - P05		F	HM - P05	1	-		G1	16.0							NO
A344	1	3' - 0"	7' - 2"	1 3/4"	HM - P05		F	HM - P05	1	-		G1	49.0						No	YES
A349A	1	3' - 0"	7' - 0"	1 3/4"	HM - P05		F	HM - P05	1	90 MIN			8.0							YES
A349B	1	3' - 0"	7' - 0"	1 3/4"	HM - P05		F	HM - P05	1	90 MIN			8.0							YES



DOOR PANEL TYPES



INTERIOR FRAME TYPES

DOOR AND FRAME SCHEDULE GENERAL NOTES

A. ALL EXTERIOR HOLLOW METAL FRAMES SHALL BE FILLED WITH INSULATION.
B. ALL INTERIOR HOLLOW METAL FRAMES SET IN MASONRY AND CONCRETE WALLS SHALL BE GROUTED SOLID.
C. ALL HOLLOW METAL FRAMES SET IN METAL STUD WALLS SHALL BE FILLED WITH MINERAL WOOL BLANKET INSULATION.
D. ALL EXTERIOR FRAMES SHALL BE INSTALLED WITH 1/4" SHIM AND SEALANT AROUND PERIMETER OF FRAME.
E. MASONRY LINTELS AND STEEL LINTELS ARE SHOWN ON STRUCTURAL DRAWINGS.
F. GLASS TYPES FOR DOORS ARE INDICATED IN THE DOOR GLAZING COLUMN OF THE DOOR AND FRAME SCHEDULE. GLASS TYPES FOR FRAMES ARE INDICATED ON THE FRAME ELEVATIONS.
G. FOR COILING DOORS, GRILLES AND SECTIONAL DOORS, WIDTH AND HEIGHT DIMENSIONS SHOWN IN DOOR AND FRAME SCHEDULE REPRESENT FINISHED OPENING SIZE. CONTRACTOR TO COORDINATE EXACT SIZE OF DOOR WITH MANUFACTURER.
H. FRAME MANUFACTURER SHALL COORDINATE LOCATIONS OF ALL CONCEALED CONDUIT AND J-BOXES REQUIRED FOR SECURITY SYSTEM HARDWARE PRIOR TO MANUFACTURING OF HOLLOW METAL FRAMES AND COORDINATE WITH SECURITY HARDWARE AND DEVICES.
I. PROVIDE HEAD RECEIVERS AT ALUMINUM STOREFRONTS AND CURTAIN WALLS AS REQUIRED FOR STRUCTURAL DEFLECTION ALLOWANCE.
J. SEE SPECIFICATIONS HARDWARE SECTION FOR HARDWARE SETS NOTED IN DOOR AND FRAME SCHEDULE.

DOOR PANEL TYPE DESCRIPTIONS

DG	DUAL LITE GLASS
F	FLUSH PANEL
FG	FULL LITE GLASS
FL	FULL LOUVERED
G	HALF LITE GLASS
GL	HALF LITE GLASS & LOUVERED
L	LOUVERED (BOTTOM)
LL	LOUVERED (TOP & BOTTOM)
N	NARROW LITE GLASS
NL	NARROW LITE GLASS & LOUVERED
TL	LOUVERED (TOP)
V	VISION LITE GLASS (10" SQUARE)
VL	VISION LITE GLASS & LOUVERED

GLAZING TYPE DESCRIPTIONS

AFG	ATTACK RESISTANT GLASS FILM
CG	CLEAR FLOAT GLASS
CIG	CLEAR INSULATING GLASS
CTG	CLEAR TEMPERED FLOAT GLASS
02 CTG	CLEAR TEMPERED INSULATING GLASS
FRG	FIRE-RESISTIVE GLASS
GL	GLASS
IIP	INSULATED INFILL PANEL GLASS
LG	LAMINATED GLASS
PG	PATTERN GLASS
PIG	PATTERN INSULATING GLASS
SG	SPANDREL GLASS
SG	SPECIALTY GLASS
TFG	TINTED FLOAT GLASS
TG	TEMPERED GLASS
TIG	TINTED INSULATING GLASS
TTG	TINTED TEMPERED FLOAT GLASS
TTIG	TINTED TEMPERED INSULATING GLASS

DLR GROUP
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REGISTERED ARCHITECT
CHARLES E. BRYANT
STATE OF TEXAS

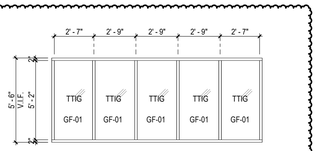
CRANDALL ISD HIGH SCHOOL
PAC ADDITION
13385 Fm 3039, Crandall, TX 75114

ISSUE FOR BID AND PERMIT
2024.07.25
REVISIONS
01 08/19/24 ADDENDUM 01
02 09/03/24 ADDENDUM 02

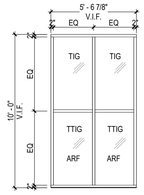
39-23712-00

DOOR & FRAME TYPE & SCHEDULE

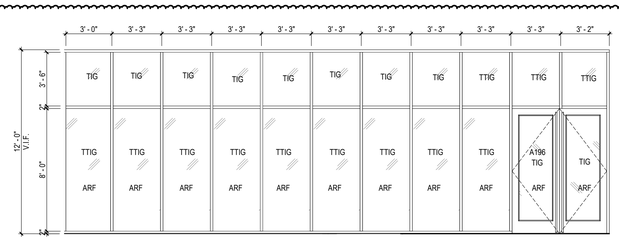
A8.3



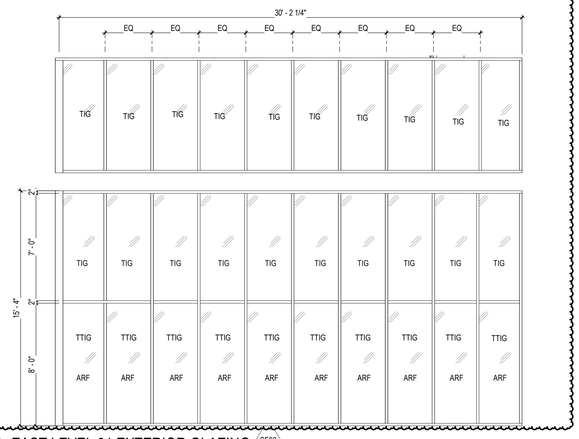
1A A8.5 WEST LEVEL 02 EXTERIOR GLAZING SF05
SCALE: 1/4" = 1'-0"



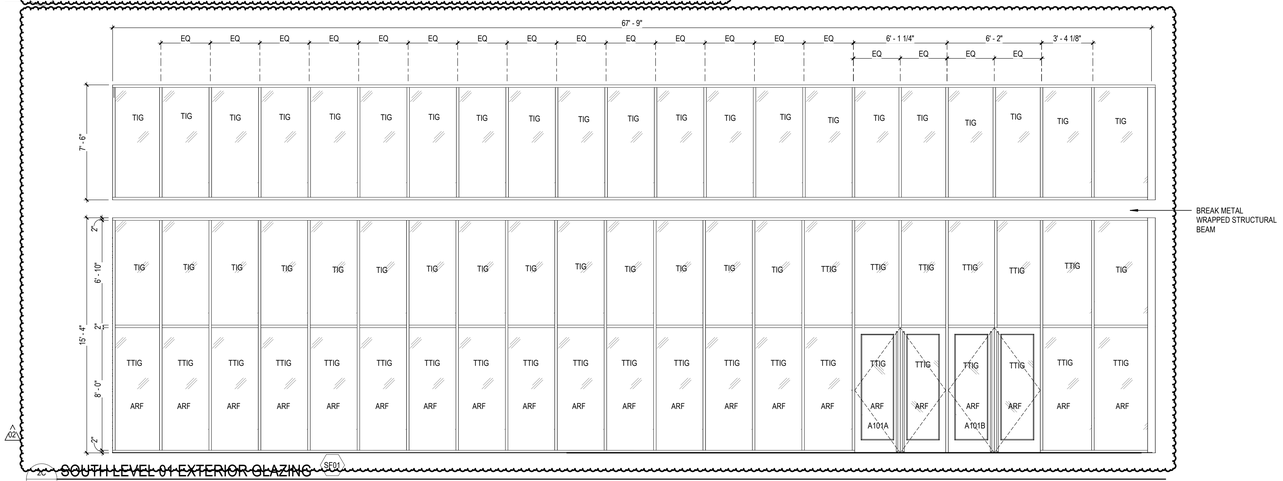
1B A8.5 SOUTH LEVEL 01 EXTERIOR GLAZING SF04
SCALE: 1/4" = 1'-0"



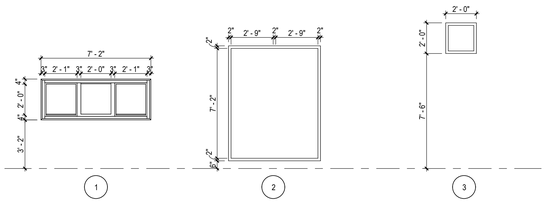
1C A8.5 EAST LEVEL 01 EXTERIOR GLAZING SF03
SCALE: 1/4" = 1'-0"



2A A8.5 EAST LEVEL 01 EXTERIOR GLAZING SF02
SCALE: 1/4" = 1'-0"



2C A8.5 SOUTH LEVEL 01 EXTERIOR GLAZING SF01
SCALE: 1/4" = 1'-0"



INTERIOR WINDOW ELEVATIONS

EXTERIOR STOREFRONT SCHEDULE

MARK	FRAME TYPE	FRAME DEPTH	FRAME MATERIAL	DETAILS HEAD	DETAILS JAMB LEFT	DETAILS JAMB RIGHT	DETAILS SILL	COMMENTS
SF01	A	6"	ALUM					
SF02								
SF03		6"	ALUM					
SF04		6"	ALUM					
SF05		6"	ALUM					

INTERIOR WINDOW SCHEDULE

NUMBER	FRAME TYPE	FRAME MATERIAL	FIRE RATING	DETAILS HEAD	DETAILS JAMB LEFT	DETAILS JAMB RIGHT	DETAILS SILL	COMMENTS
A116	1	ALUM	-					ACOUSTICALLY RATED, BASIS OF DESIGN -DEVAC 450 GLIDER, LAMINATED GLASS
A117	1	ALUM	-					ACOUSTICALLY RATED, BASIS OF DESIGN -DEVAC 450 GLIDER, LAMINATED GLASS
A118	2	HM	-					ACOUSTICALLY RATED, BASIS OF DESIGN -DEVAC 450 GLIDER, LAMINATED GLASS
A119	2	HM	-					ACOUSTICALLY RATED, BASIS OF DESIGN -DEVAC 450 GLIDER, LAMINATED GLASS
A121	3	HM	-					PROJECTION WINDOW, OPTICALLY CLEAR, LOW-IRON FLOAT GLASS. 1. Basis-of-Design: AMIRAN, Schott North America

GLAZING TYPE DESCRIPTIONS

A22	AFG	ATTACK RESISTANT GLASS FILM
	CG	CLEAR FLOAT GLASS
	CIG	CLEAR INSULATING GLASS
	CTG	CLEAR TEMPERED FLOAT GLASS
	CTIG	CLEAR TEMPERED INSULATING GLASS
A22	FRG	FIRE-RESISTIVE GLASS
	GL	GLASS
	IIP	INSULATED INFILL PANEL GLASS
	LG	LAMINATED GLASS
	PG	PATTERN GLASS
	PIG	PATTERN INSULATING GLASS
	SG	SPANDREL GLASS
	SG	SPECIALTY GLASS
	TFG	TINTED FLOAT GLASS
	TG	TEMPERED GLASS
	TIG	TINTED INSULATING GLASS
	TTG	TINTED TEMPERED FLOAT GLASS
	TTIG	TINTED TEMPERED INSULATING GLASS

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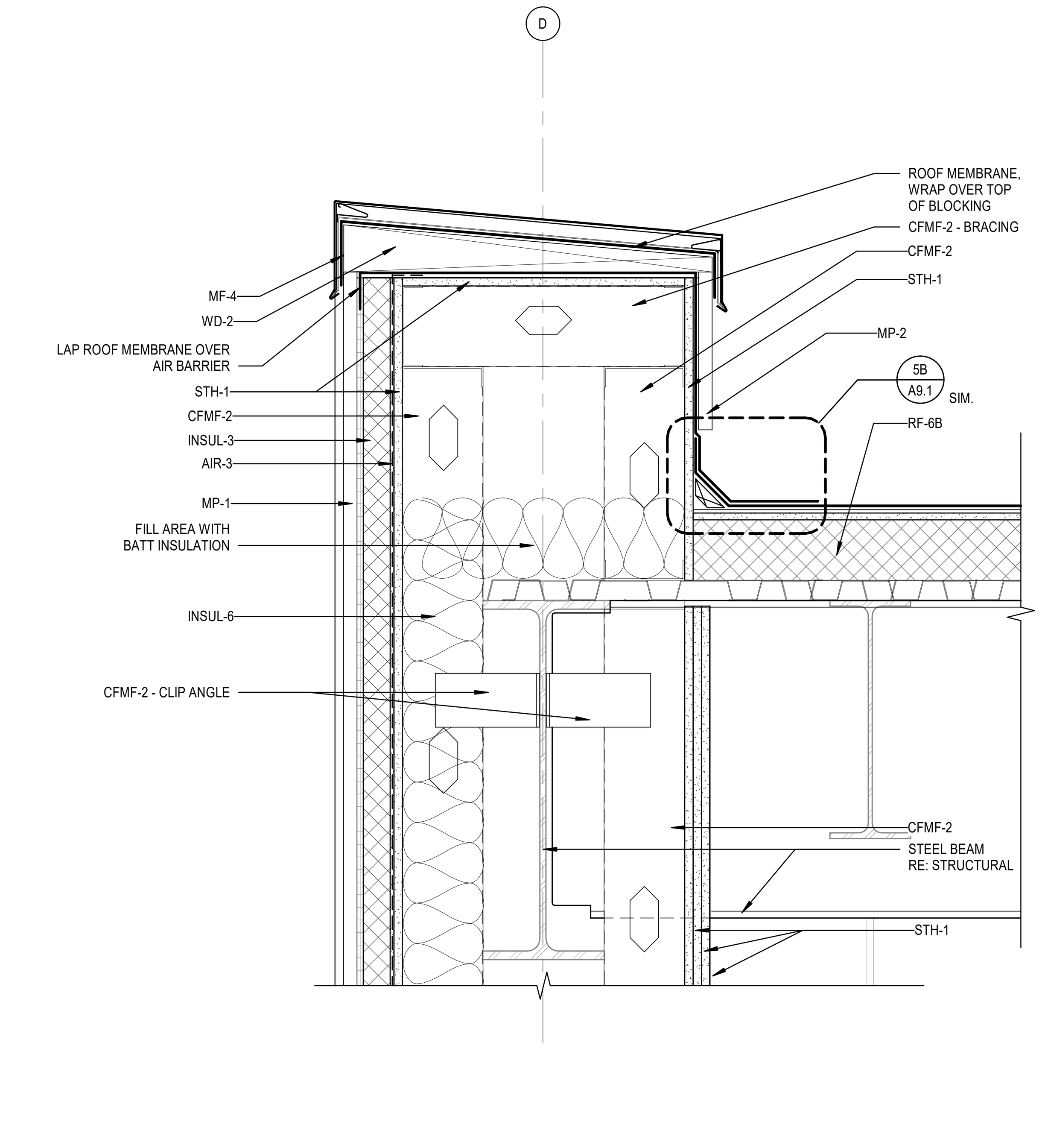
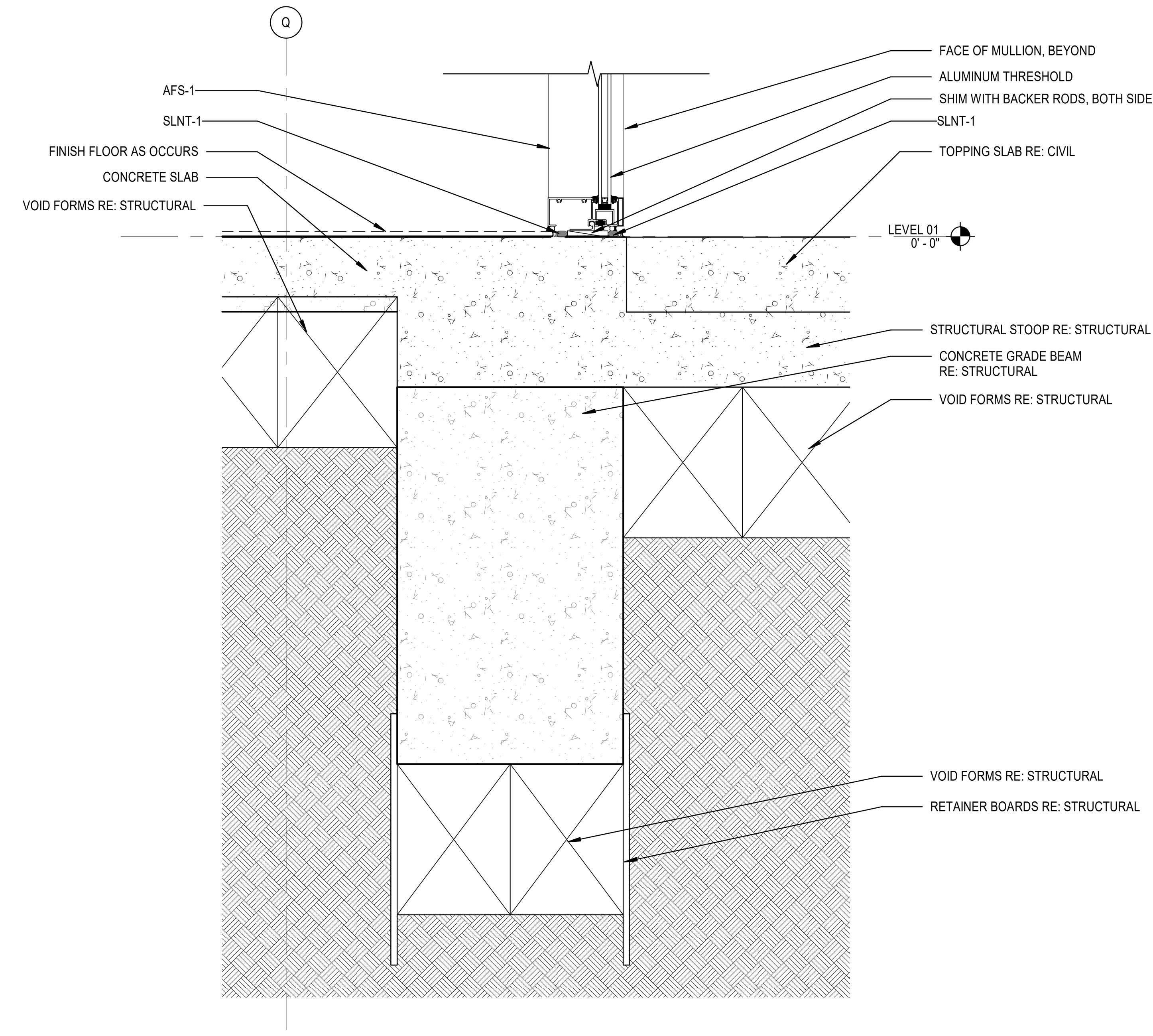
WINDOW TYPES, SCHEDULES, & ELEVATIONS

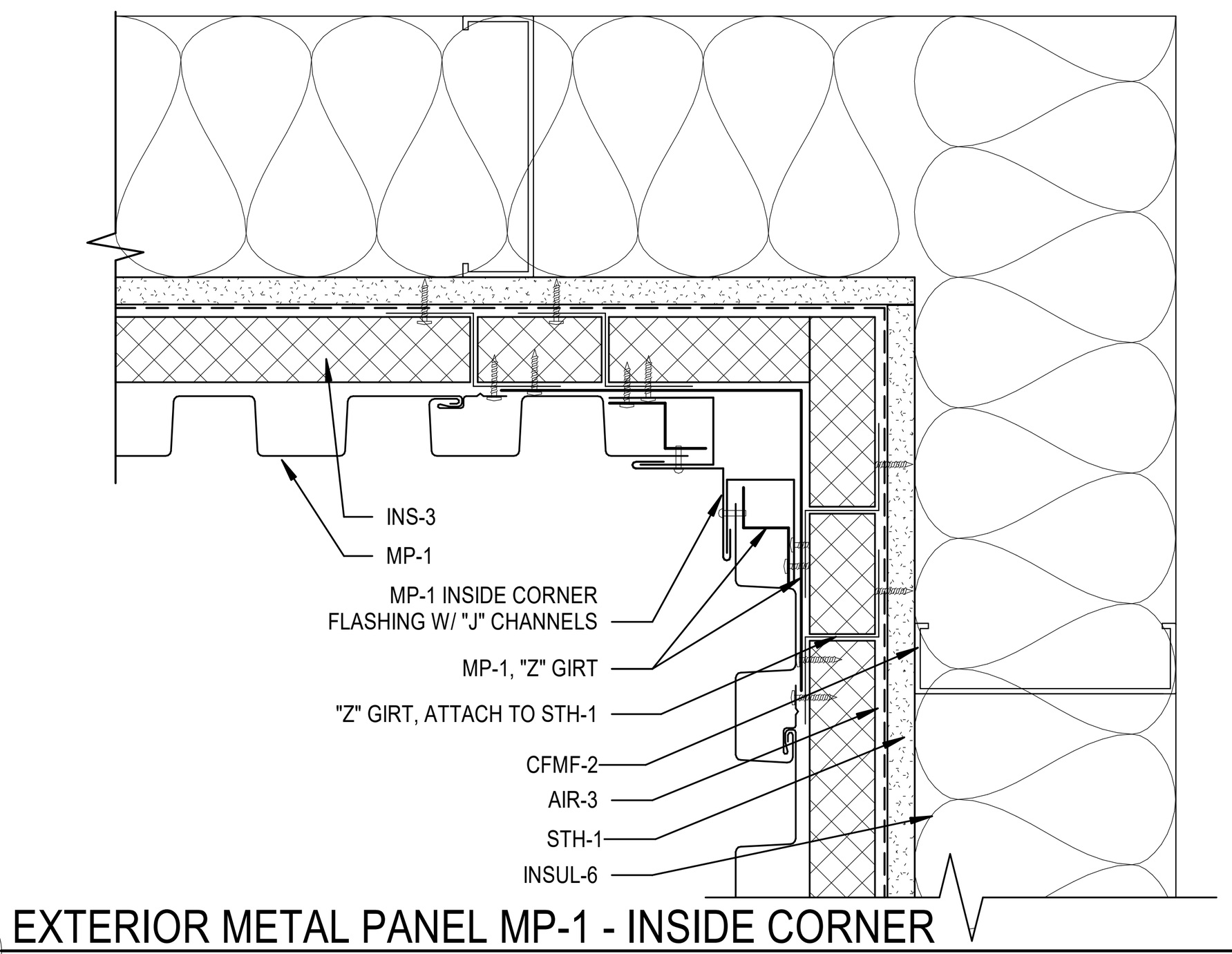
A8.5



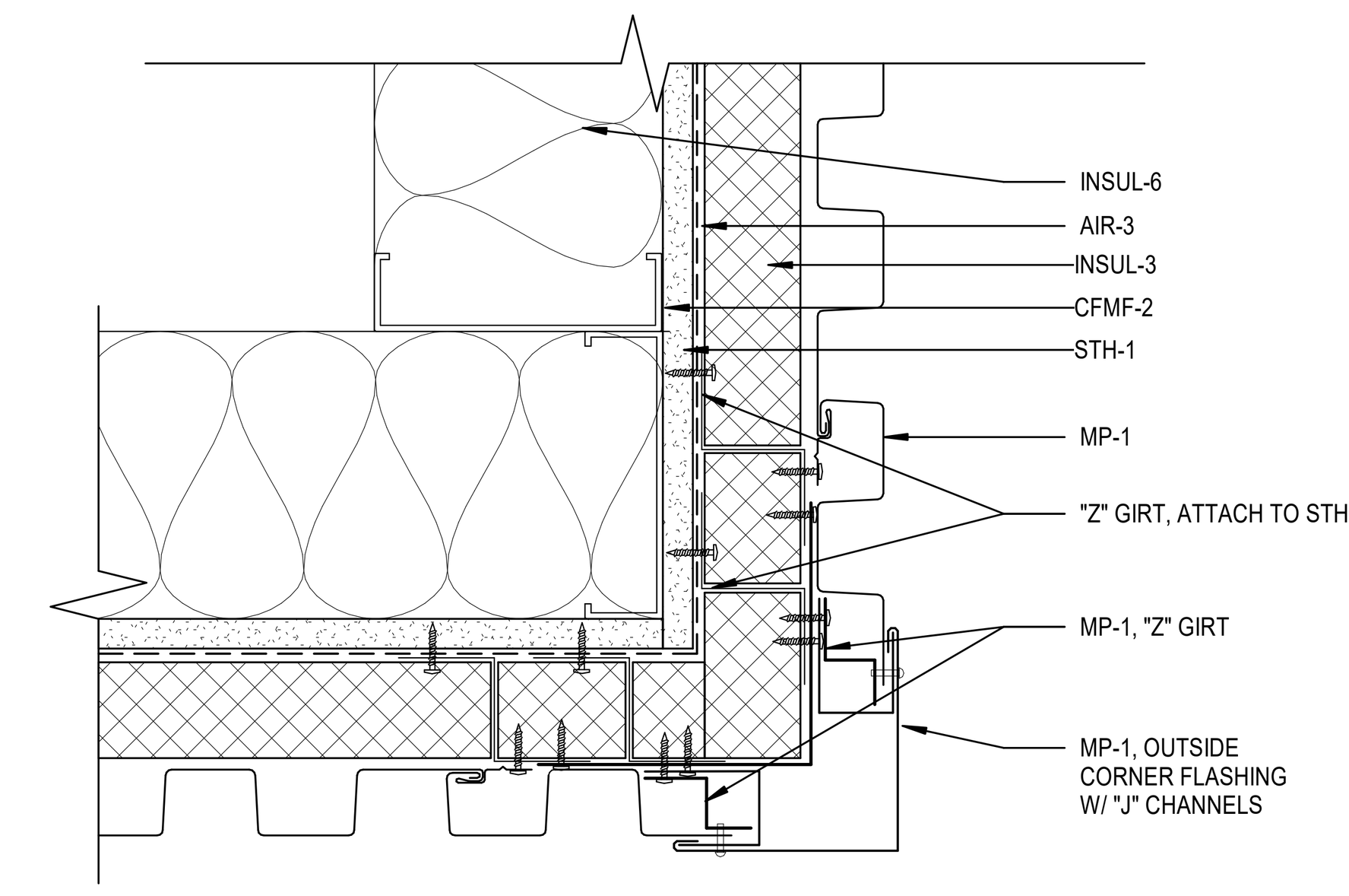
2A | A9.1
PARAPET CAP AT METAL WALL PANEL
SCALE: 1 1/2" = 1'-0"



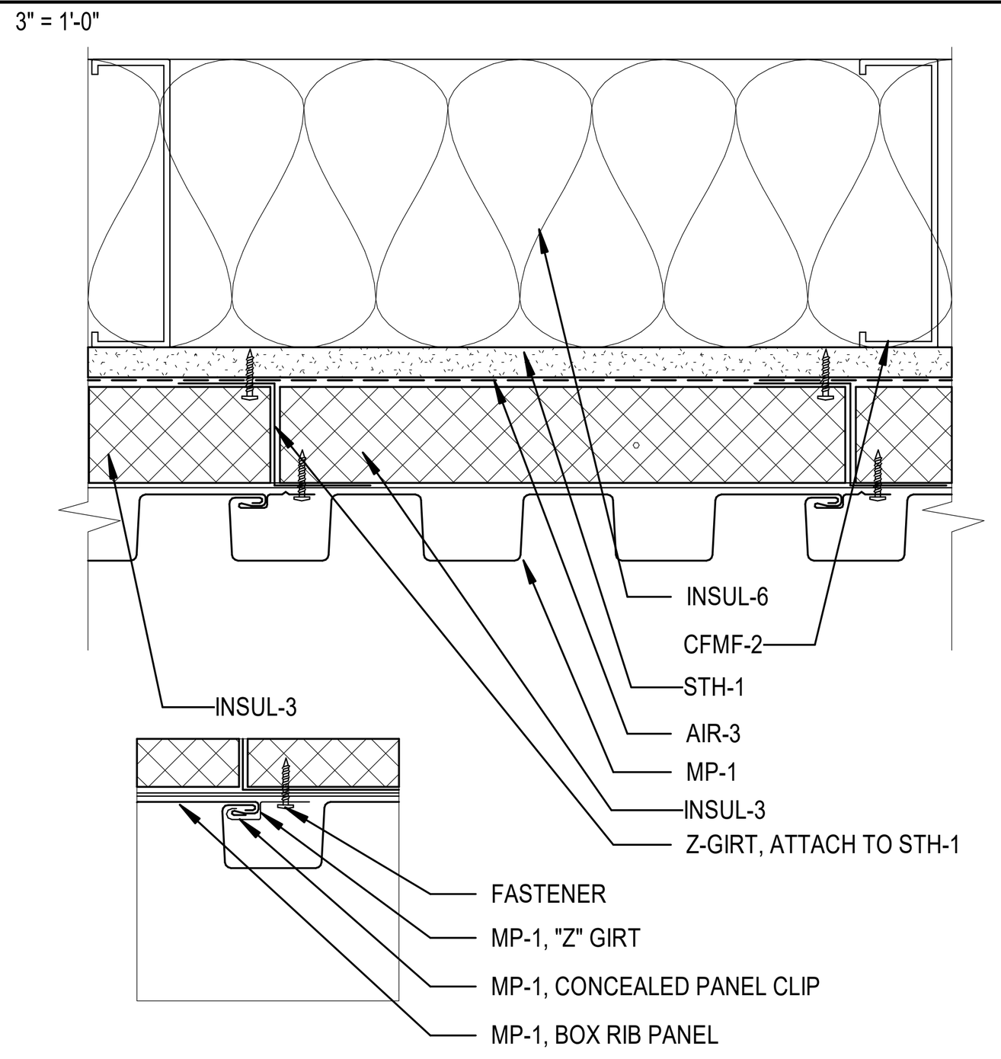
2C | A9.1
WALL SECTION DETAIL
SCALE: 1 1/2" = 1'-0"



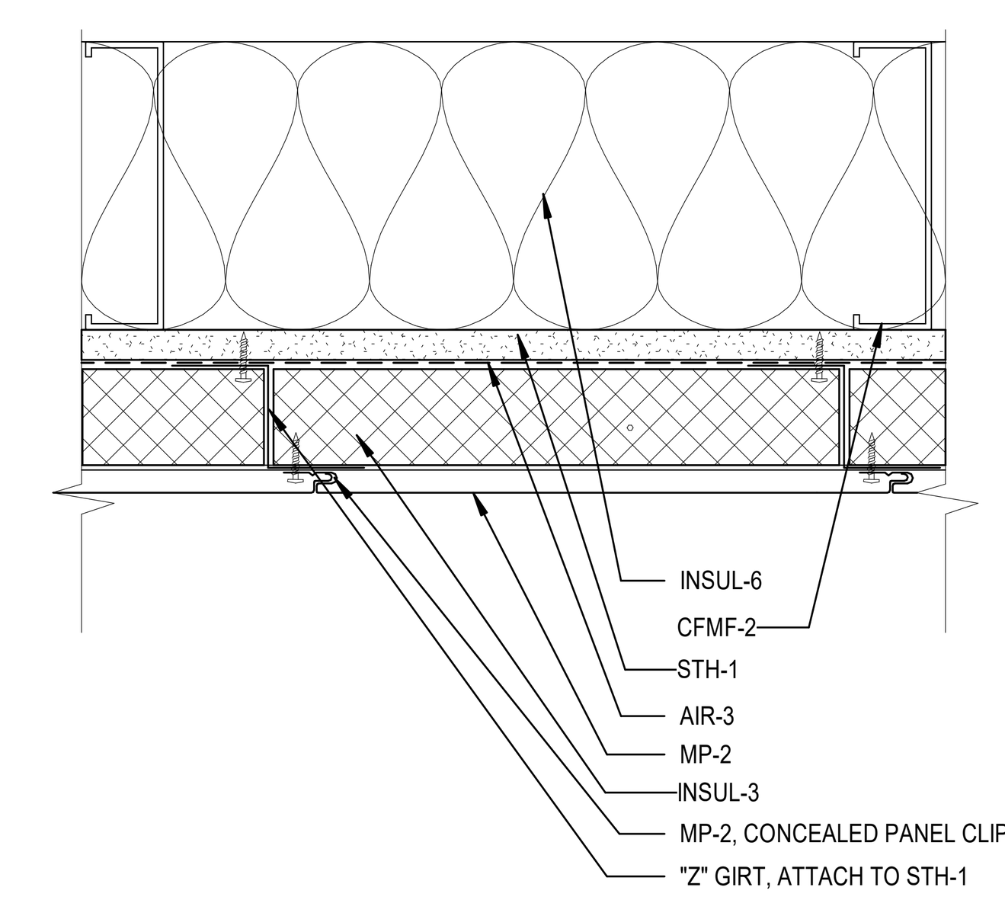
1E | A9.1
EXTERIOR METAL PANEL MP-1 - INSIDE CORNER
SCALE: 3" = 1'-0"



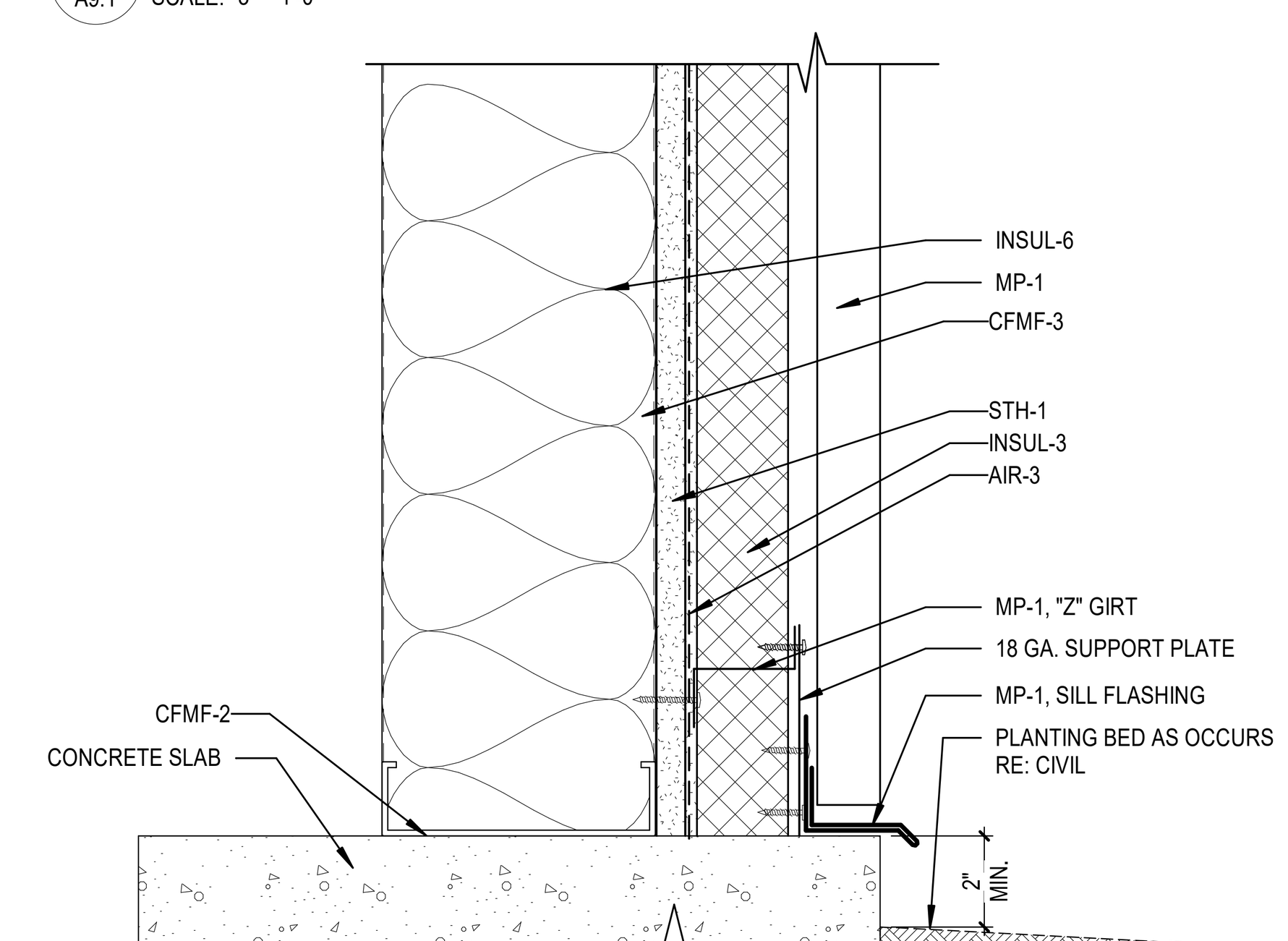
2E | A9.1
EXTERIOR METAL PANEL MP-1 - OUTSIDE CORNER
SCALE: 3" = 1'-0"



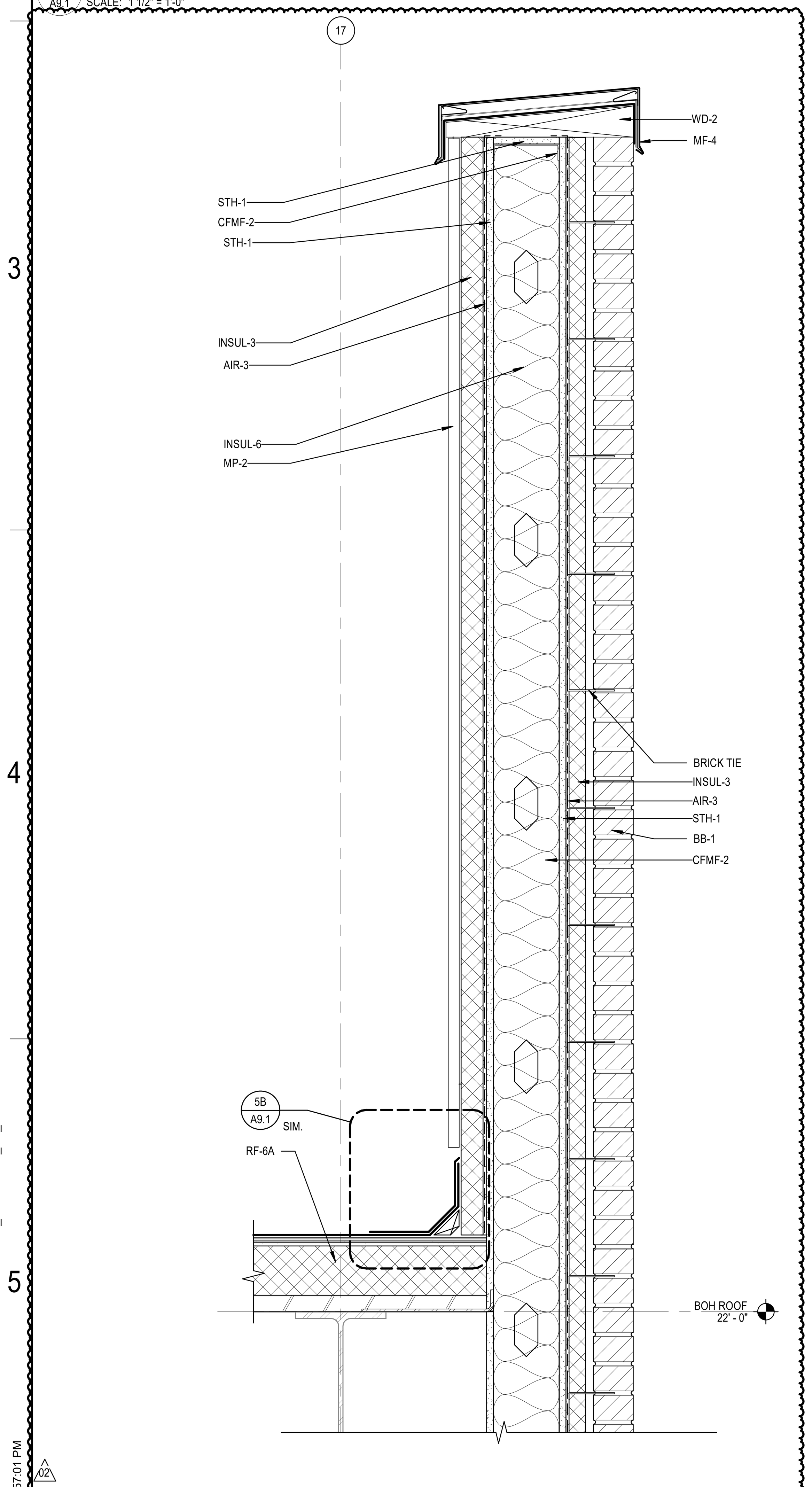
3E | A9.1
METAL PANEL SYSTEM MP-1
SCALE: 3" = 1'-0"



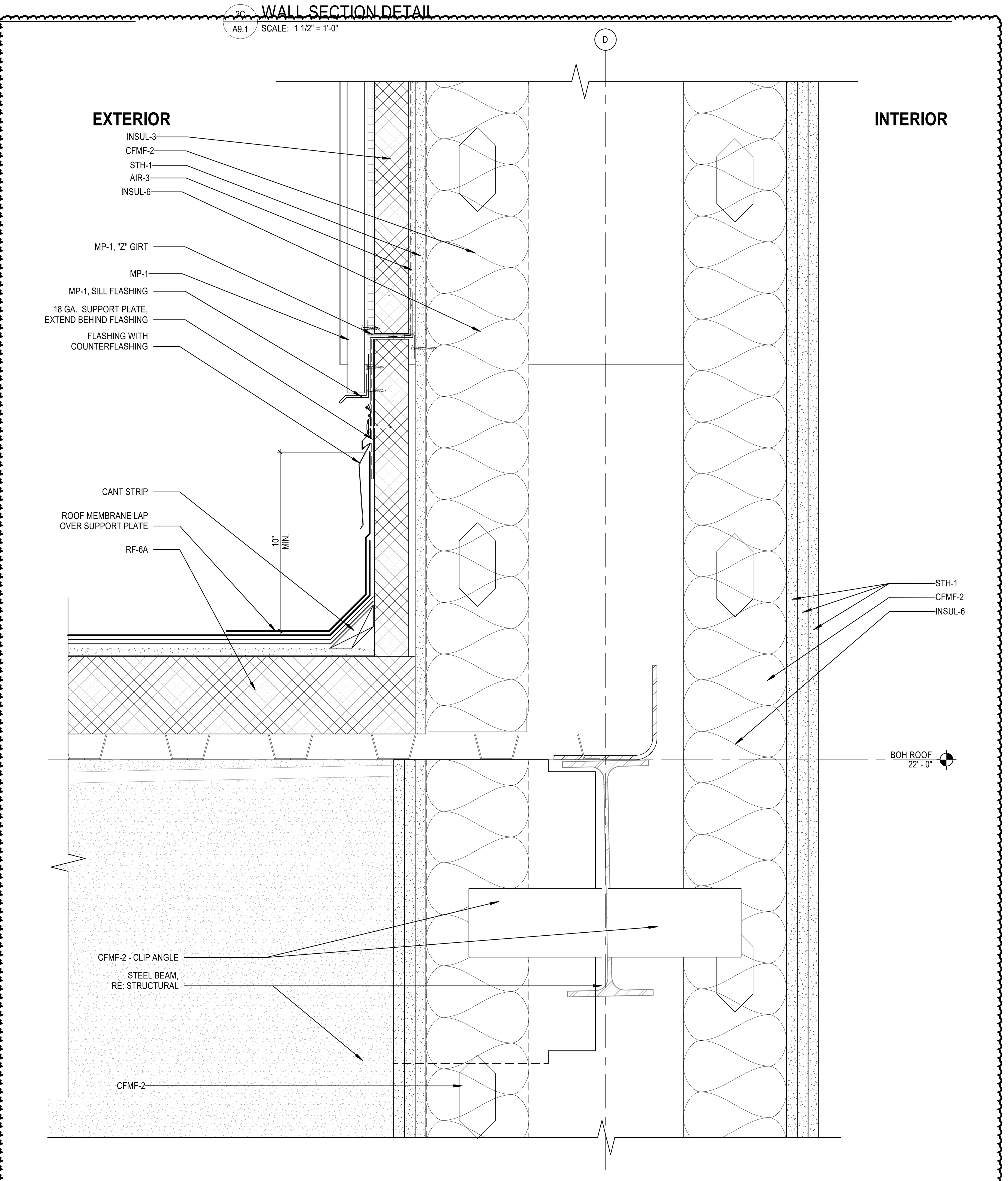
4E | A9.1
METAL PANEL SYSTEM MP-2
SCALE: 3" = 1'-0"



5E | A9.1
METAL PANEL WALL SYSTEM - SILL
SCALE: 3" = 1'-0"



5A | A9.1
PARAPET CAP AT BRICK VENEER WALL
SCALE: 1 1/2" = 1'-0"



5B | A9.1
EXTERIOR METAL WALL PANELS AT ROOF
SCALE: 3" = 1'-0"

REFERENCE KEYNOTES

AFS-1	ALUM FRAMED STOREFRONT TYPE 1
AIR-3	WEATHER BARRIER
CFMF-2	CFMF EXTERIOR NON-LOAD-BEARING WALL FRAMING
CFMF-3	CFMF INTERIOR NON-LOAD-BEARING WALL FRAMING
INSUL-3	POLYISOCYANURATE (POLYISO) INSULATION
INSUL-6	MINERAL-WOOL BLANKET INSULATION, UNFACED
MF-4	PREFINISHED SHEET METAL COPING W/ CONT CLEAT
MP-1	FORMED METAL WALL PANEL, PAC-CLAD BOX RIB 3, OR SIMILAR
MP-2	FORMED METAL WALL PANEL, PAC-CLAD FLUSH PANEL, OR SIMILAR. AT ALL PLACES WHERE ROOF TO CAP EXCEEDS 12" AS SHOWN, LAP UNDER COPING
RF-6B	2-PLY MODIFIED BITUMINOUS MEMBRANE ROOFING OVER METAL ROOF DECK
SLNT-1	SEALANT TYPE 1
STH-1	GLASS-MAT GYPSUM SHEATHING
WD-2	2X TREATED WOOD BLOCKING

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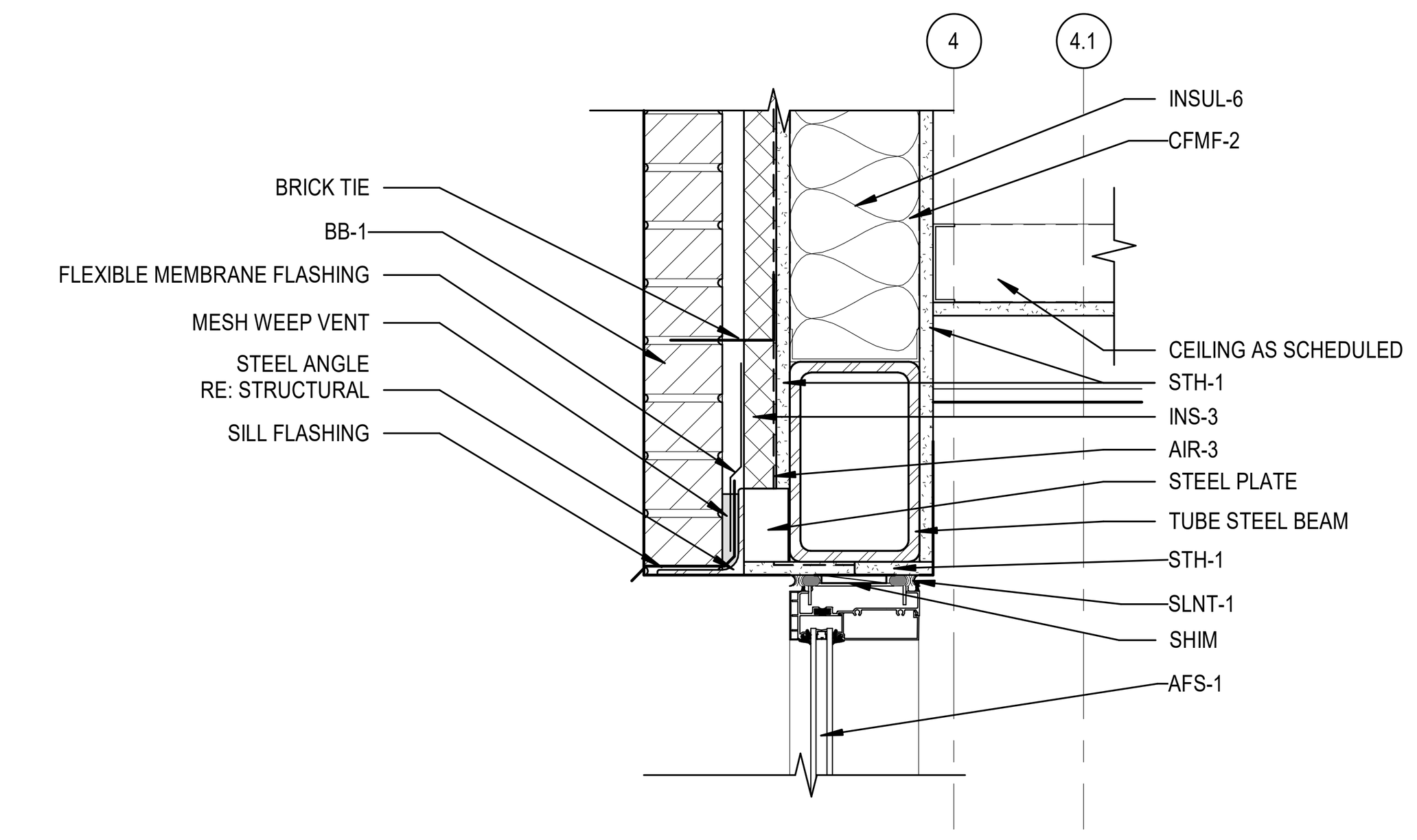
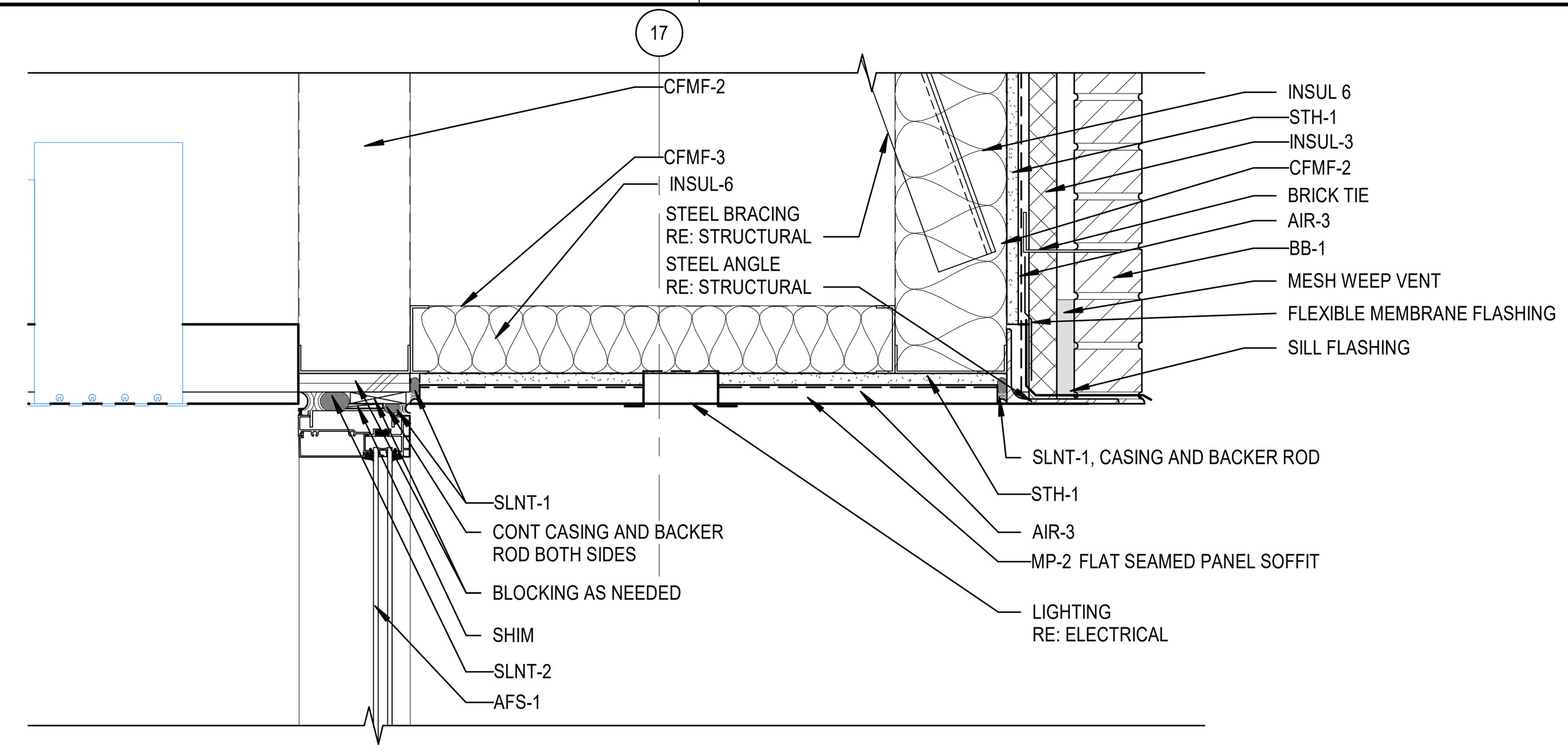
EXTERIOR DETAILS

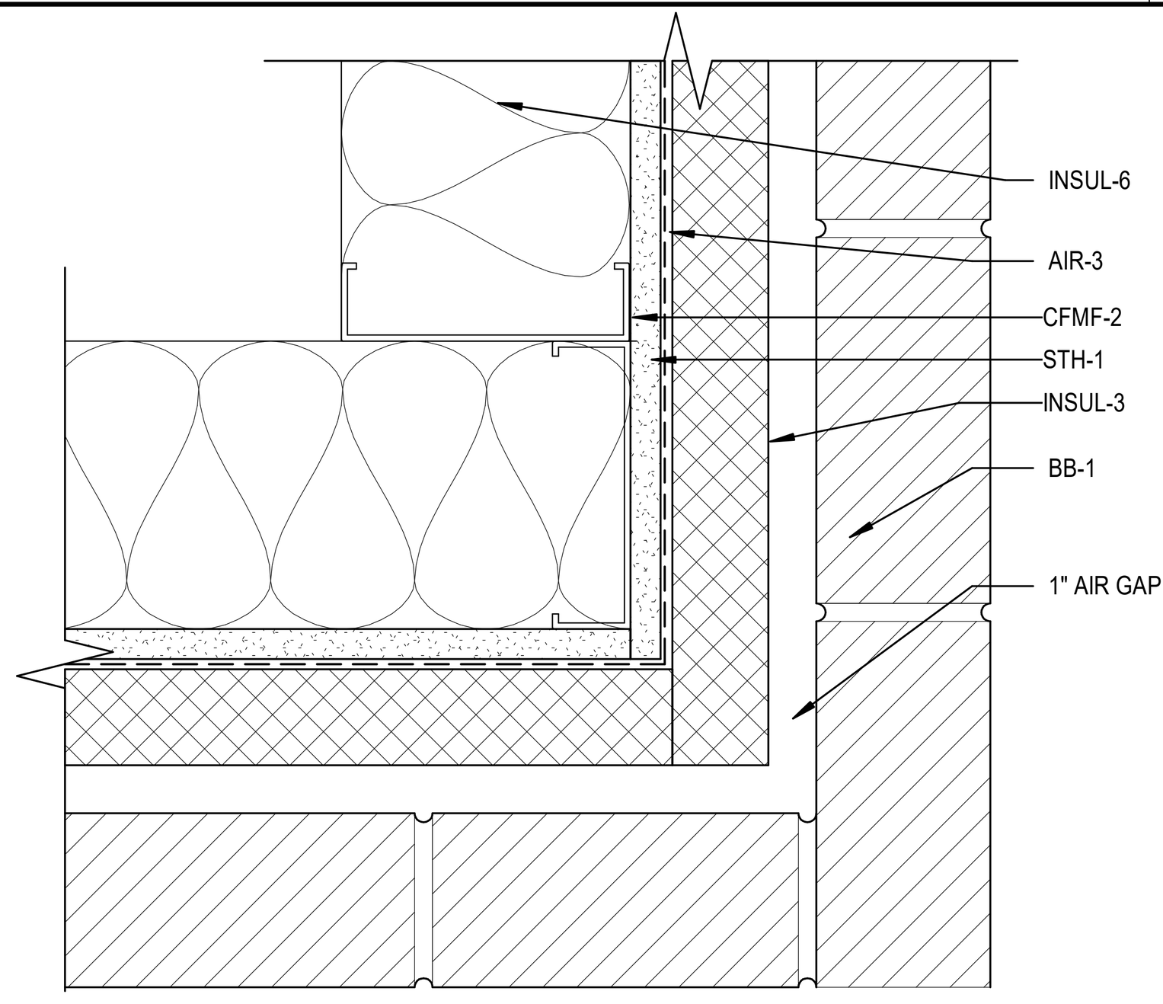
A9.1



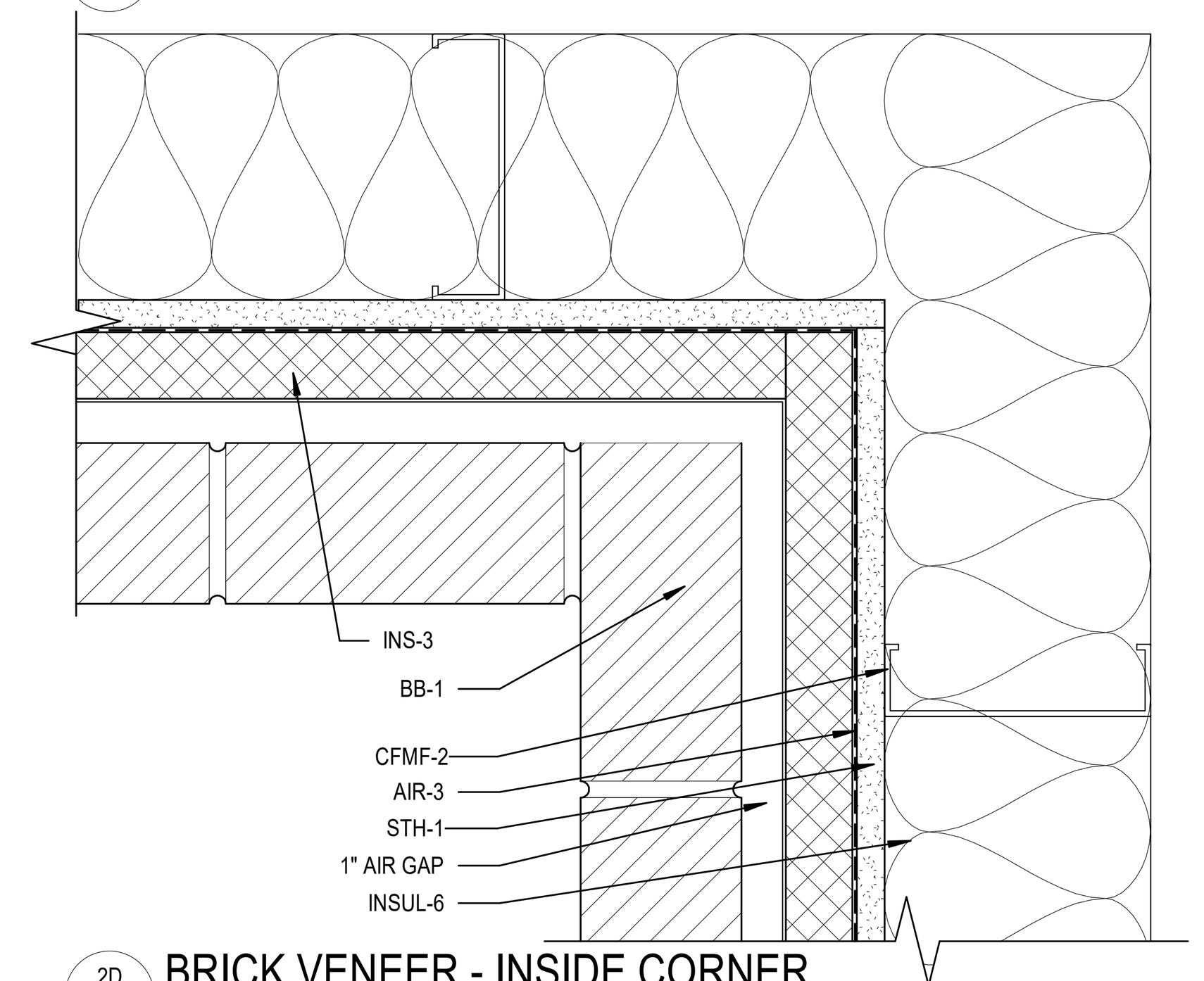
1A A9.2 **SECTION DETAIL AT WINDOW HEAD**
SCALE: 1 1/2" = 1'-0"



2C A9.2 **SECTION DETAIL AT SOFFIT**
SCALE: 1 1/2" = 1'-0"



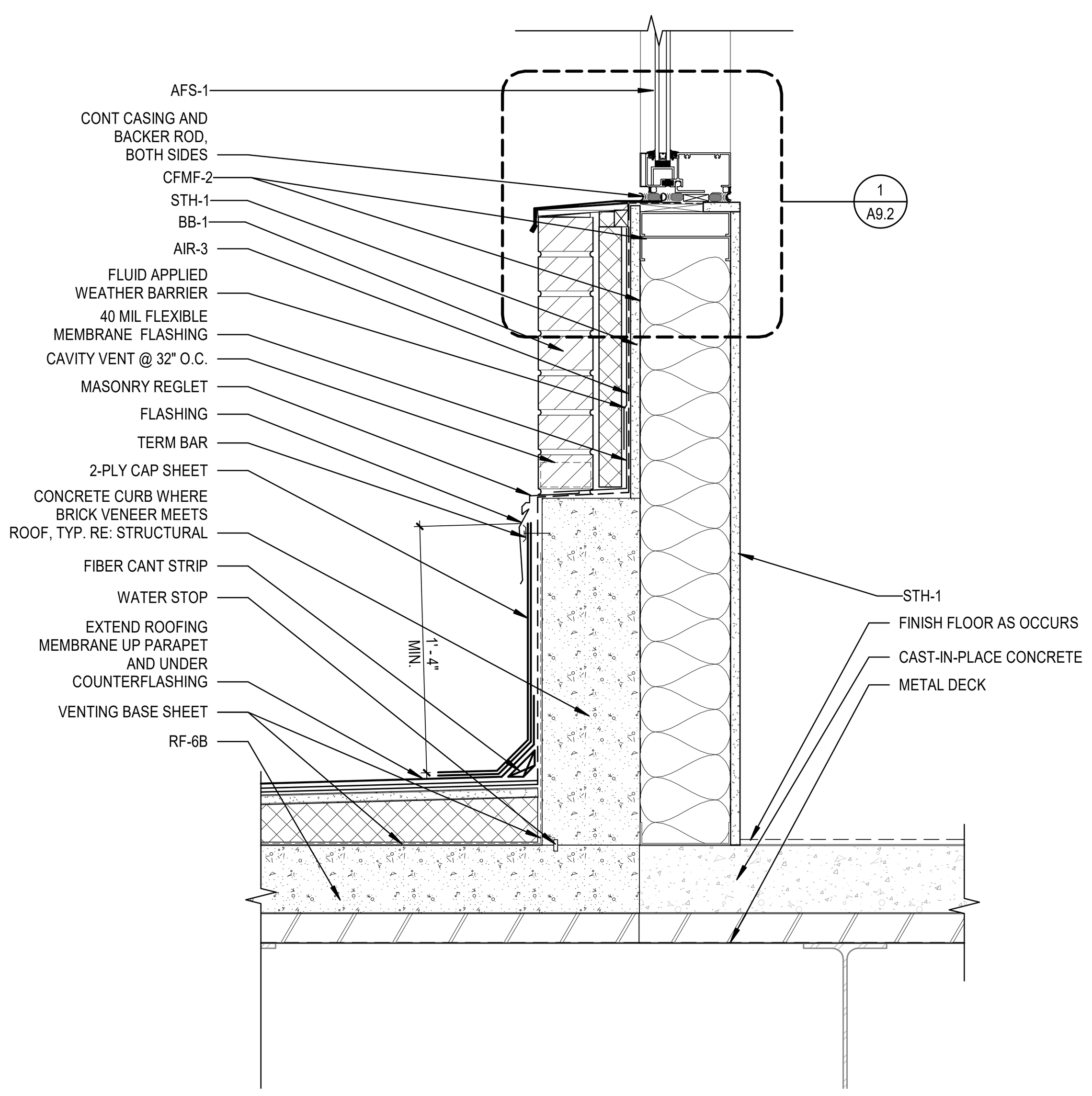
1E A9.2 **BRICK VENEER - OUTSIDE CORNER**
SCALE: 3" = 1'-0"



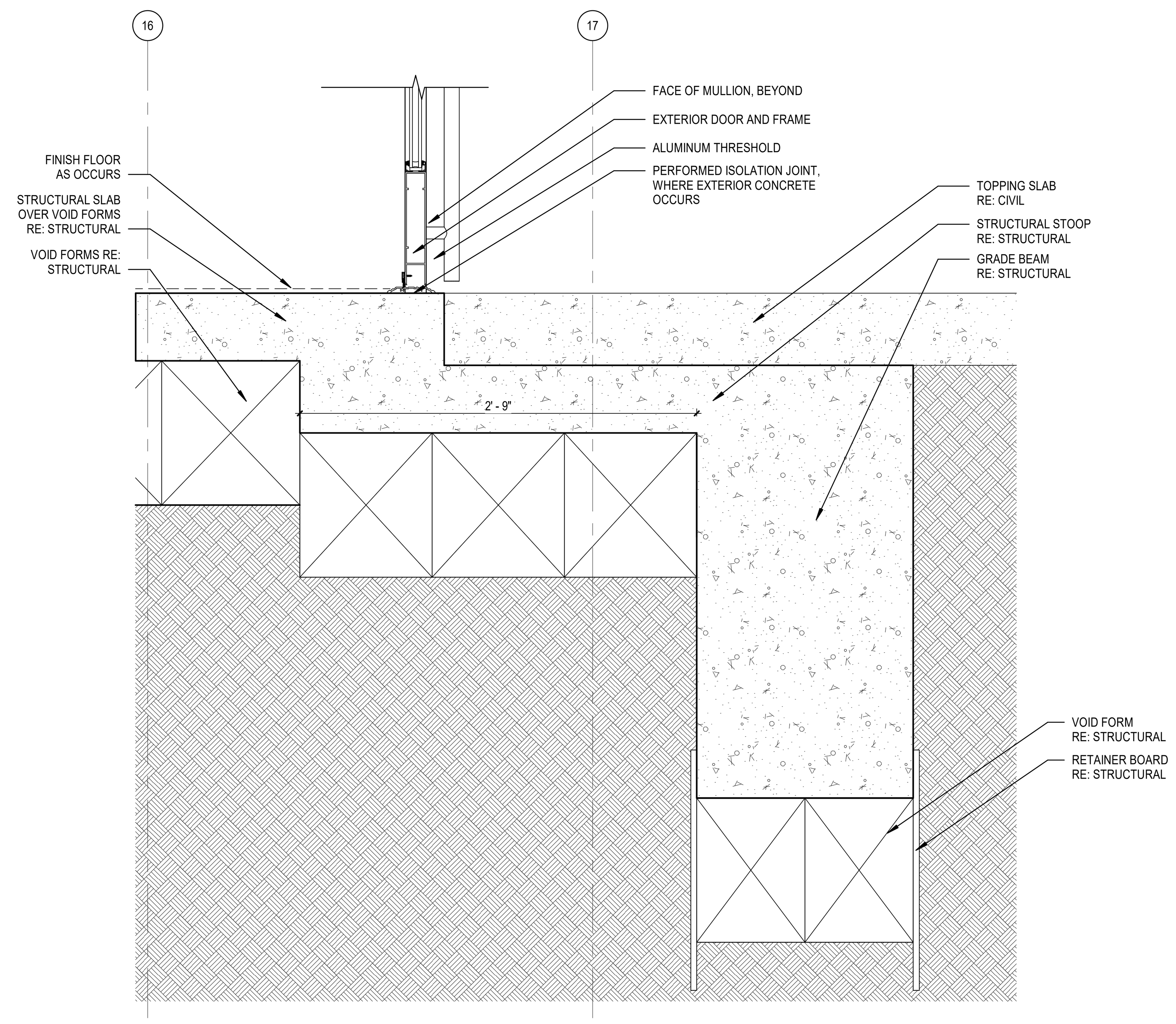
2D A9.2 **BRICK VENEER - INSIDE CORNER**
SCALE: 3" = 1'-0"

REFERENCE KEYNOTES

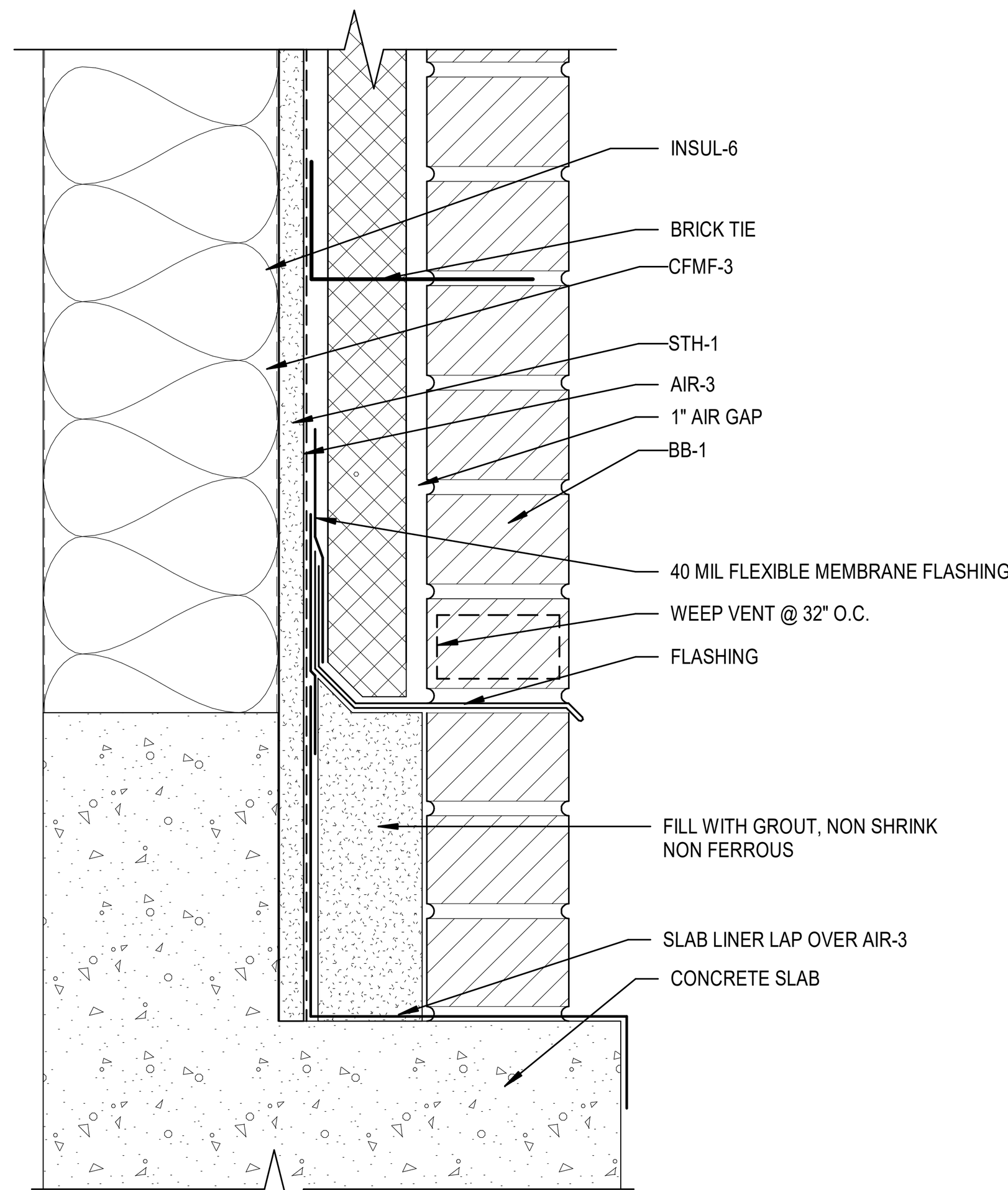
AFS-1	ALUM FRAMED STOREFRONT TYPE 1
AIR-3	WEATHER BARRIER
BB-1	BRICK BLENDED
CFMF-2	CFMF EXTERIOR NON-LOAD-BEARING WALL FRAMING
CFMF-3	CFMF INTERIOR NON-LOAD-BEARING WALL FRAMING
INSUL-3	POLYISOCYANURATE (POLYISO) INSULATION
INSUL-6	MINERAL-WOOL BLANKET INSULATION, UNFACED
MP-2	FORMED METAL WALL PANEL, PAC-CLAD FLUSH PANEL, OR SIMILAR. AT ALL PLACES WHERE ROOF TO CAP EXCEEDS 12" AS SHOWN, LAP UNDER COPING
SLNT-1	SEALANT TYPE 1
SLNT-2	SEALANT TYPE 2
STH-1	GLASS-MAT GYPSUM SHEATHING



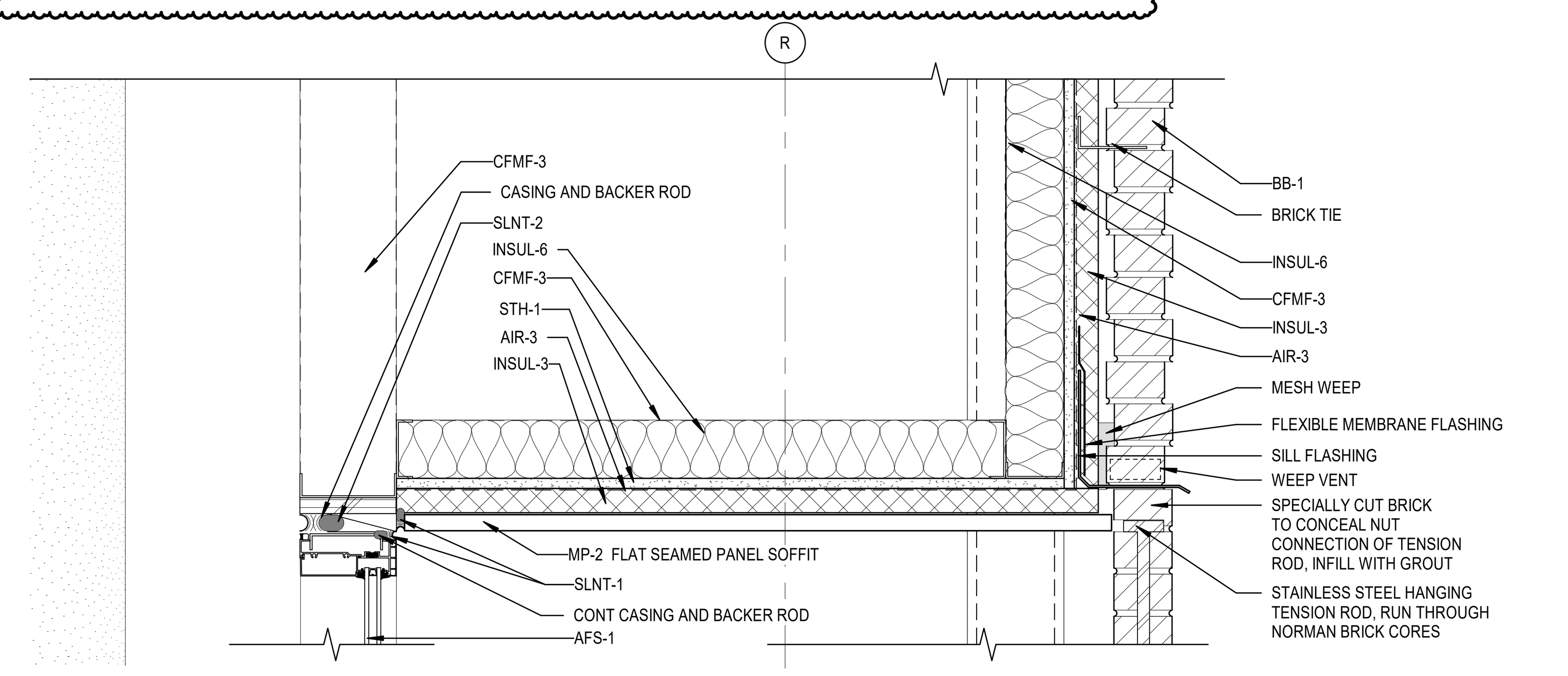
3A A9.2 **SECTION DETAIL AT WINDOW SILL**
SCALE: 1 1/2" = 1'-0"



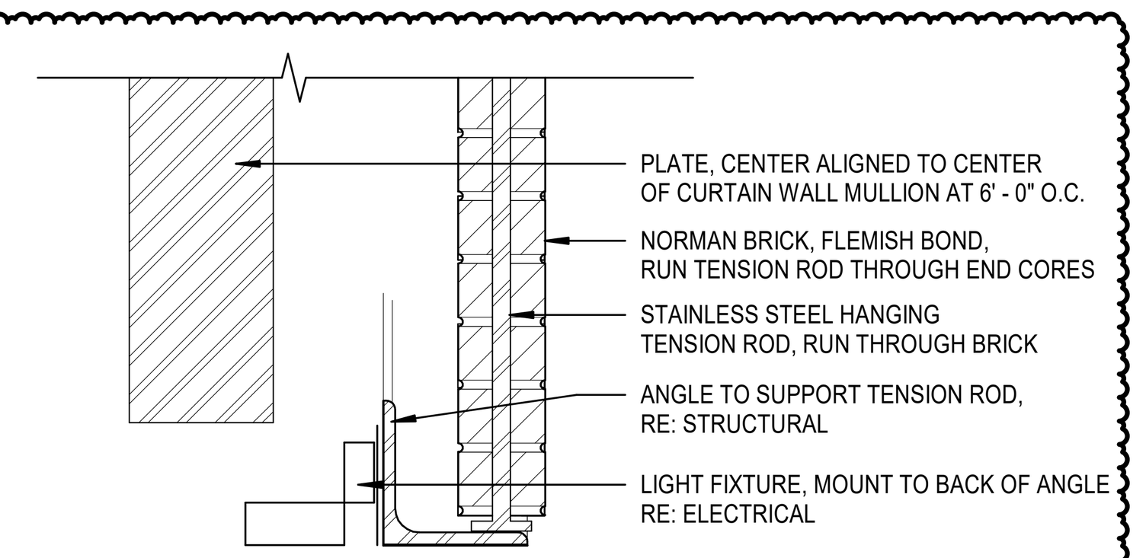
3C A9.2 **SECTION DETAIL AT ENTRY**
SCALE: 1 1/2" = 1'-0"



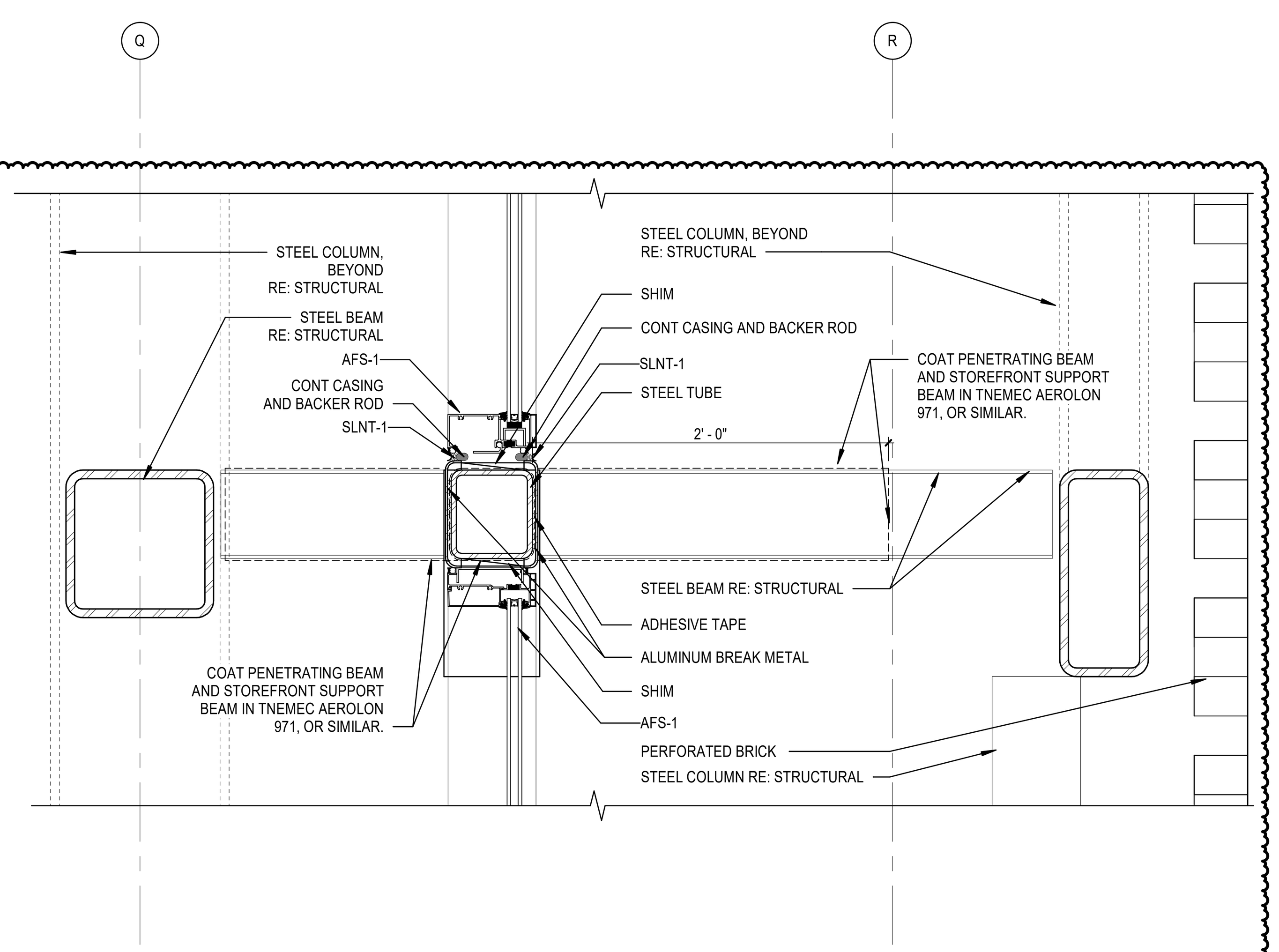
4E A9.2 **BRICK VENEER - SILL**
SCALE: 3" = 1'-0"



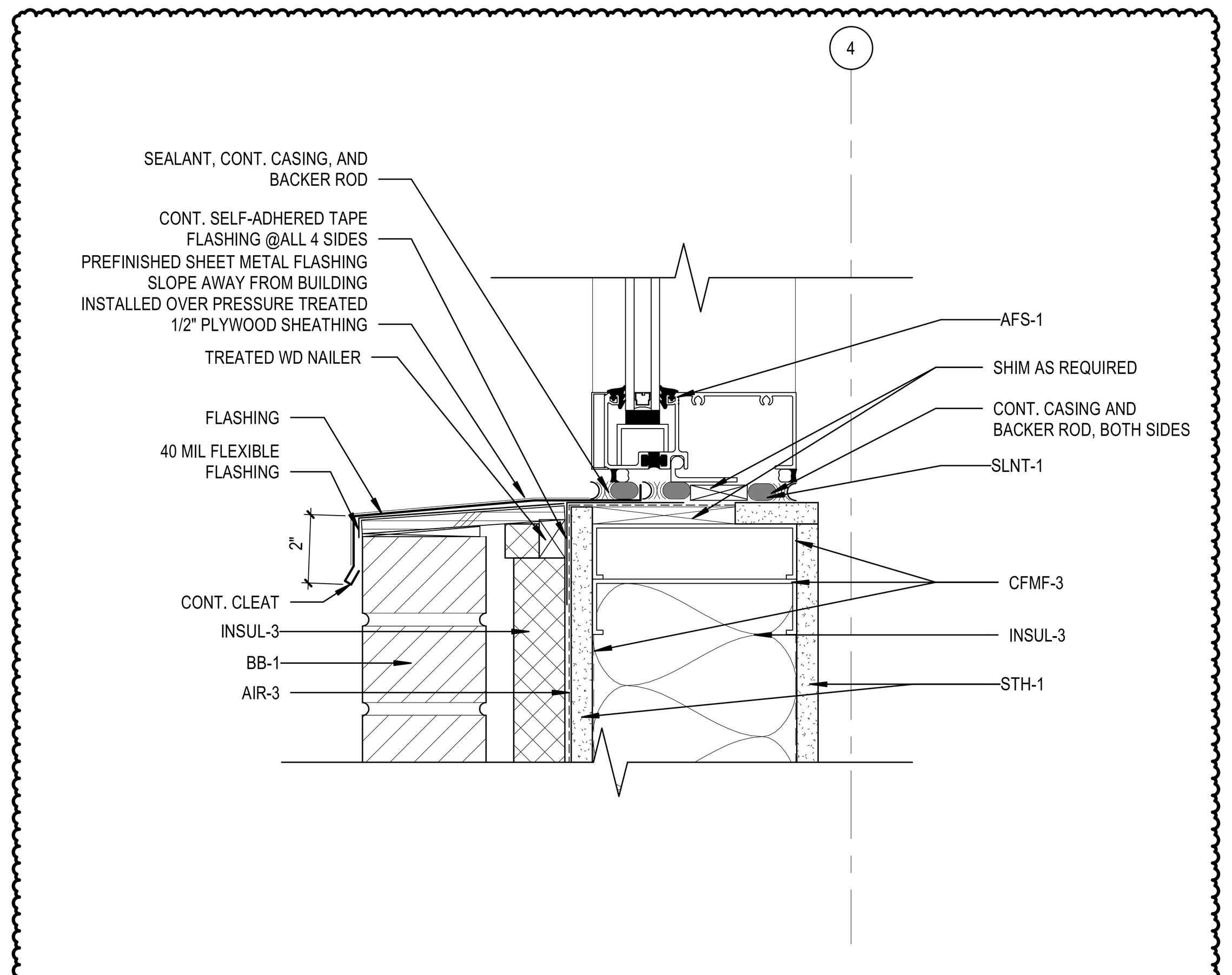
4A A9.2 **SECTION DETAIL AT PERFORATED BRICK SOFFIT**
SCALE: 1 1/2" = 1'-0"



5B A9.2 **SECTION DETAIL AT PERFORATED BRICK LEDGE**
SCALE: 1 1/2" = 1'-0"



5C A9.2 **SECTION DETAIL AT STOREFRONT**
SCALE: 1 1/2" = 1'-0"



1 A9.2 **WINDOW SILL SECTION DETAIL**
SCALE: 3" = 1'-0"

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STATE OF TEXAS
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02	09/03/24	ADDENDUM 02

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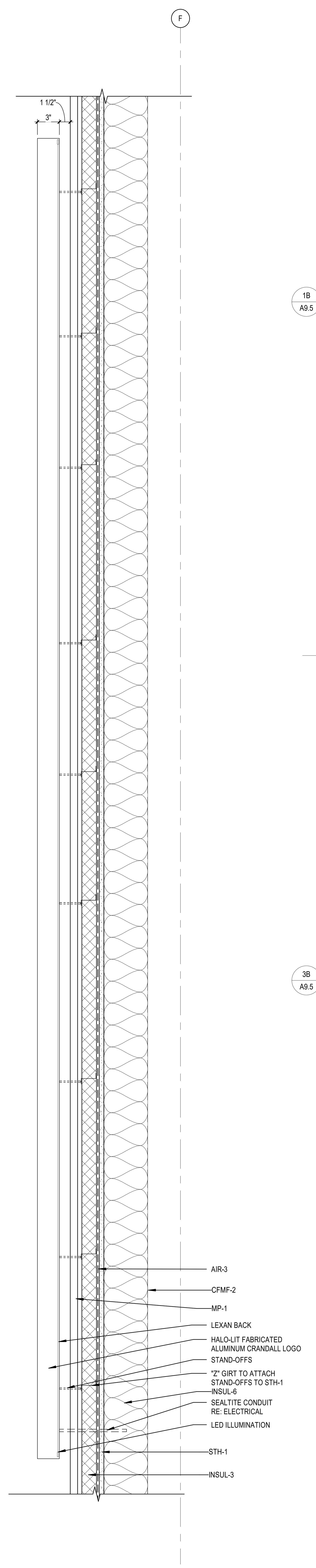
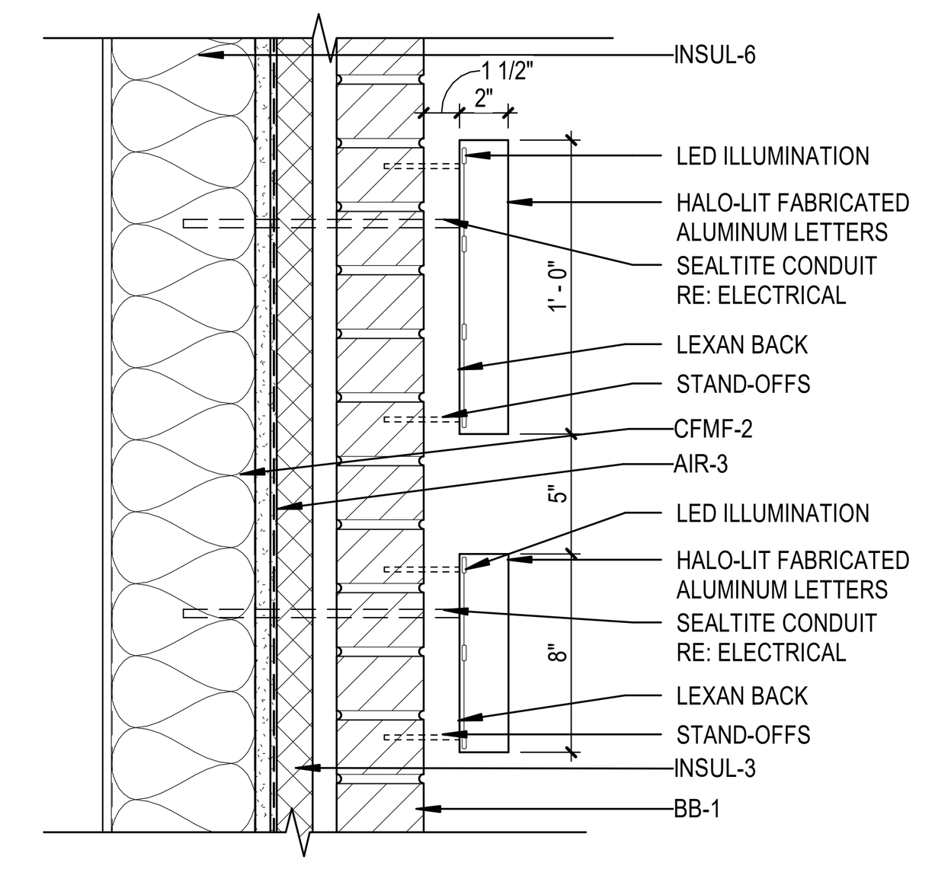
EXTERIOR DETAILS

A9.2

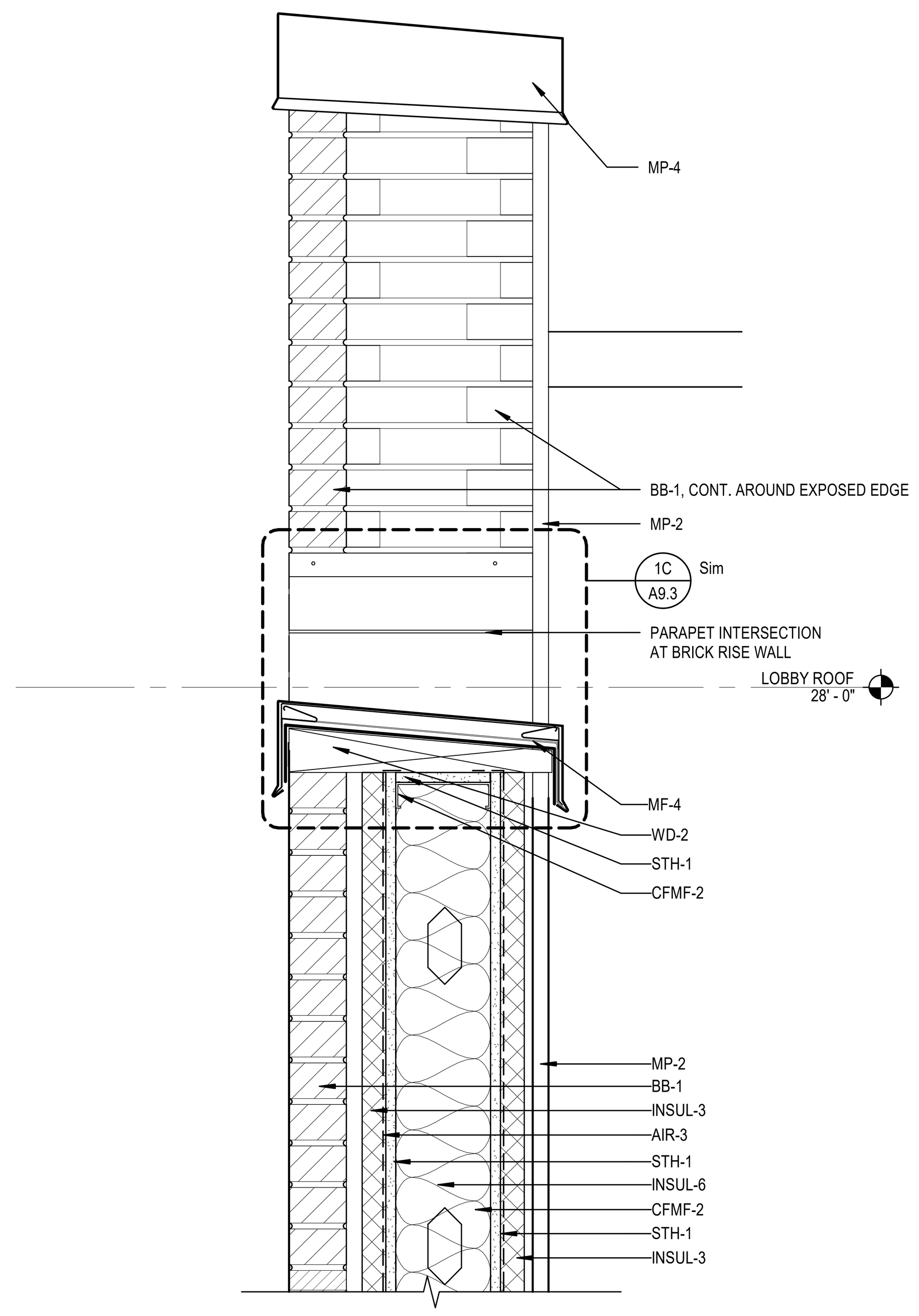
A B C D E F



5A / A9.5 SECTION DETAIL AT ILLUMINATED LOGO
SCALE: 1 1/2" = 1'-0"



1B / A9.5 SECTION DETAIL AT ILLUMINATED LETTERING
SCALE: 1 1/2" = 1'-0"



3B / A9.5 SECTION DETAIL FROM HIGH TO LOW PARAPET
SCALE: 1 1/2" = 1'-0"

REFERENCE KEYNOTES

AIR-3	WEATHER BARRIER
BB-1	BRICK BLENDED
CFMF-2	CFMF EXTERIOR NON-LOAD-BEARING WALL FRAMING
INSUL-3	POLYISOCYANURATE (POLYISO) INSULATION
INSUL-6	MINERAL-WOOL BLANKET INSULATION, UNFACED
MF-4	PREFINISHED SHEET METAL COPING W/ CONT CLEAT
MP-1	FORMED METAL WALL PANEL, PAC-CLAD BOX RIB 3, OR SIMILAR
MP-2	FORMED METAL WALL PANEL, PAC-CLAD FLUSH PANEL, OR SIMILAR. AT ALL PLACES WHERE ROOF TO CAP EXCEEDS 12" AS SHOWN, LAP UNDER COPING
STH-1	GLASS-MAT GYPSUM SHEATHING
WD-2	2X TREATED WOOD BLOCKING

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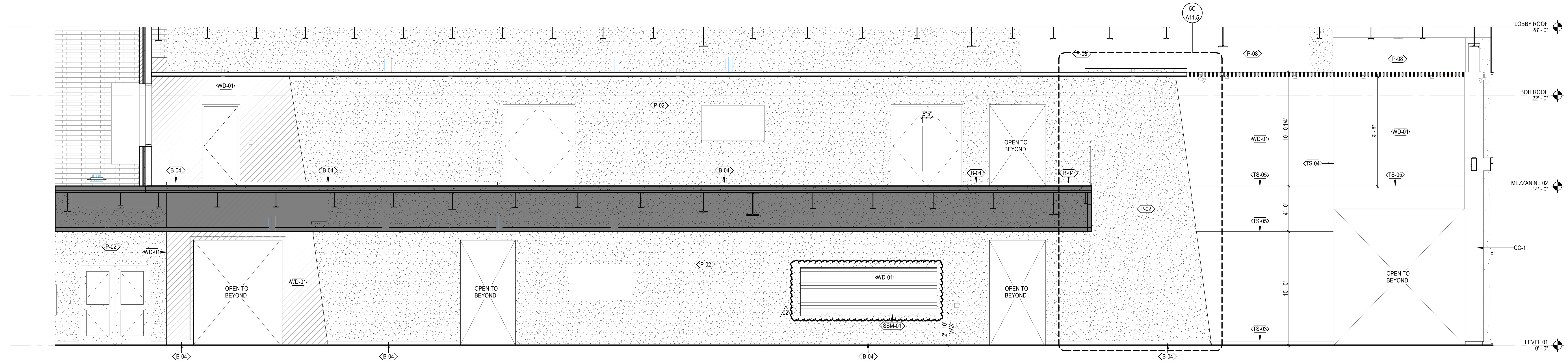
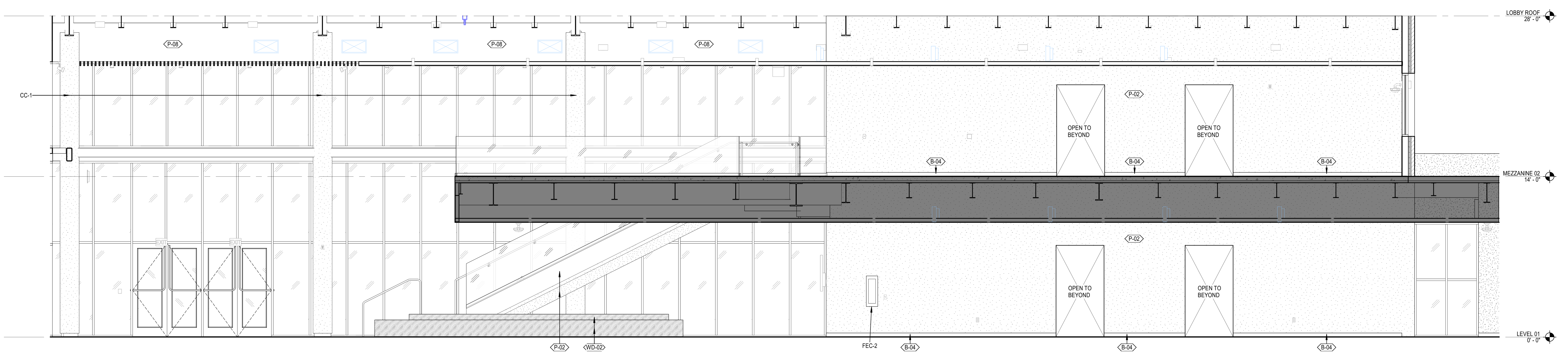
EXTERIOR DETAILS

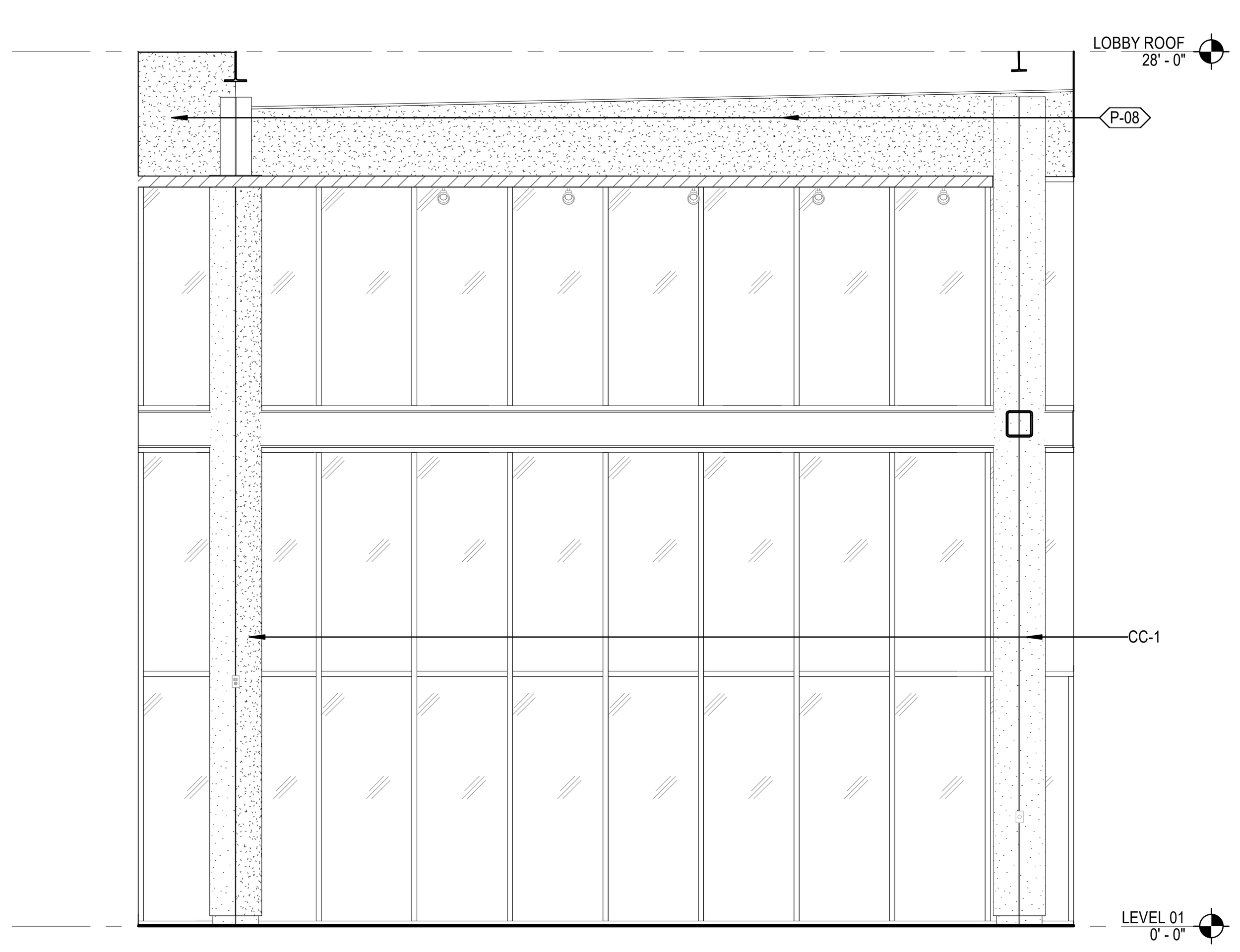
02 A9.5



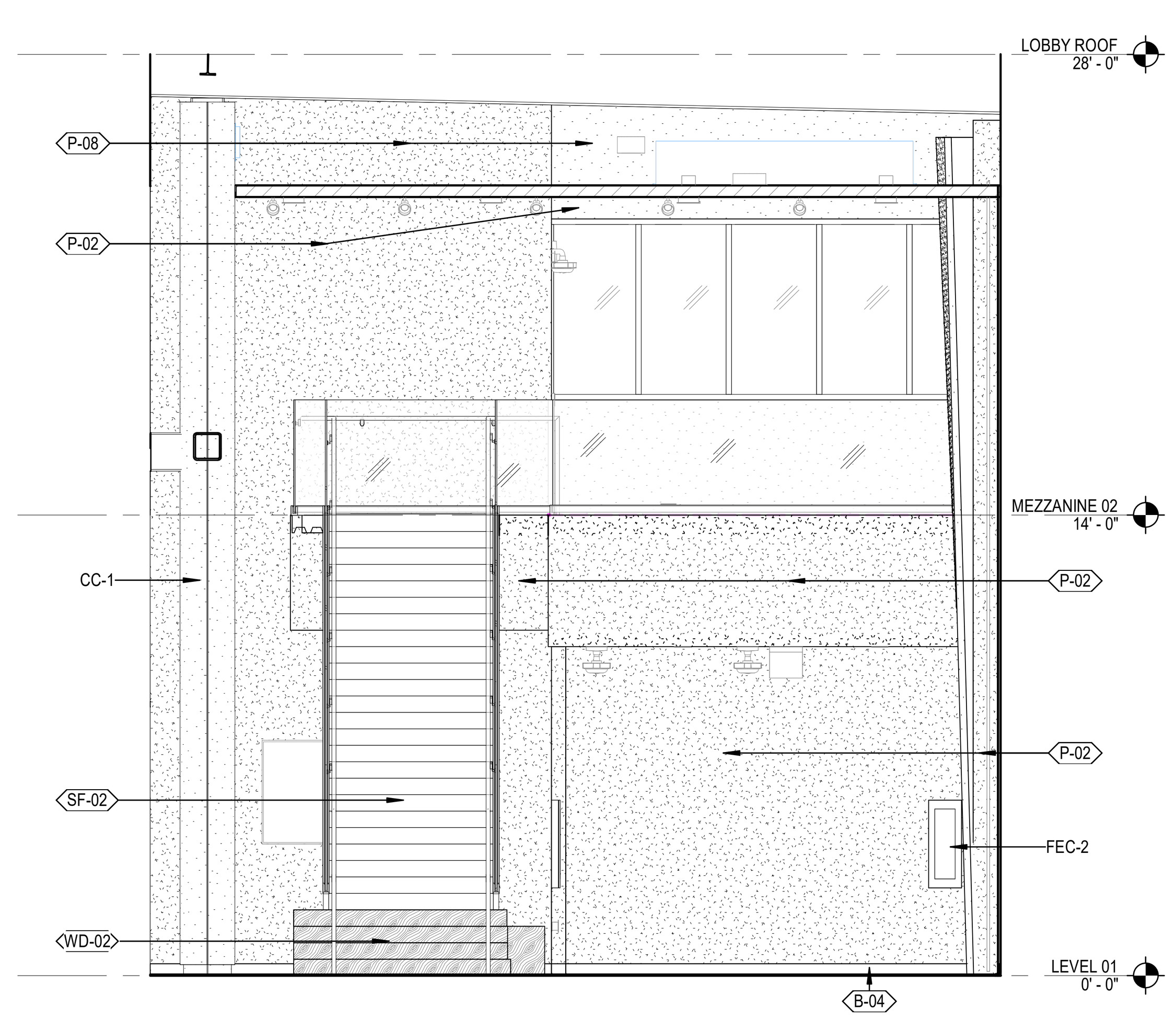
2A A10.1 A101 - LOBBY - NORTH
SCALE: 1/4" = 1'-0"



3A A10.1 A101 - LOBBY - SOUTH
SCALE: 1/4" = 1'-0"



5A A10.1 A101 - LOBBY - EAST
SCALE: 1/4" = 1'-0"



5C A10.1 A101 - LOBBY - WEST
SCALE: 1/4" = 1'-0"

ROOM FINISH SCHEDULE GENERAL NOTES

A. SEE SPECIFICATION FOR PAINTING OF ITEMS NOT NOTED IN THE ROOM FINISH SCHEDULE OR FINISH PLANS.
B. EXPOSED CONCRETE FLOORS NOT SHOWN TO RECEIVE A FINISH SHALL RECEIVE LIQUID FLOOR TREATMENT OR CURING AND SEALING COMPOUND UNLESS NOTED OTHERWISE. SEE SPEC SECTION 033000.
C. ALL GYPSUM WALLBOARD BULKHEADS SHALL BE PAINTED P-02 UNLESS NOTED OTHERWISE.
D. SEE REFLECTED CEILING PLANS FOR CEILING MATERIAL AND HEIGHT.
E. CEILING HEIGHTS, AS NOTED ON THE REFLECTED CEILING PLANS, ARE MEASURED FROM FINISH FLOOR OF THE ROOM.
F. CONTRACTOR SHALL FURNISH AND INSTALL WALL BASE AROUND CASEWORK AND MILLWORK.
G. WHERE FLOOR FINISH CHANGES FROM ONE ROOM TO ANOTHER, SET JOINT OF THE MATERIALS AT THE CENTER OF THE COMMUNICATING DOOR.
H. SEE SHEET XX.X FOR ACOUSTICAL WALL PANEL ELEVATIONS AND DETAILS.

REFERENCE KEYNOTES

CC-1	COLUMN COVER, SNAP TOGETHER
FEC-2	FIRE EXTINGUISHER CABINET RECESSED

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INTERIOR ELEVATIONS

A10.1

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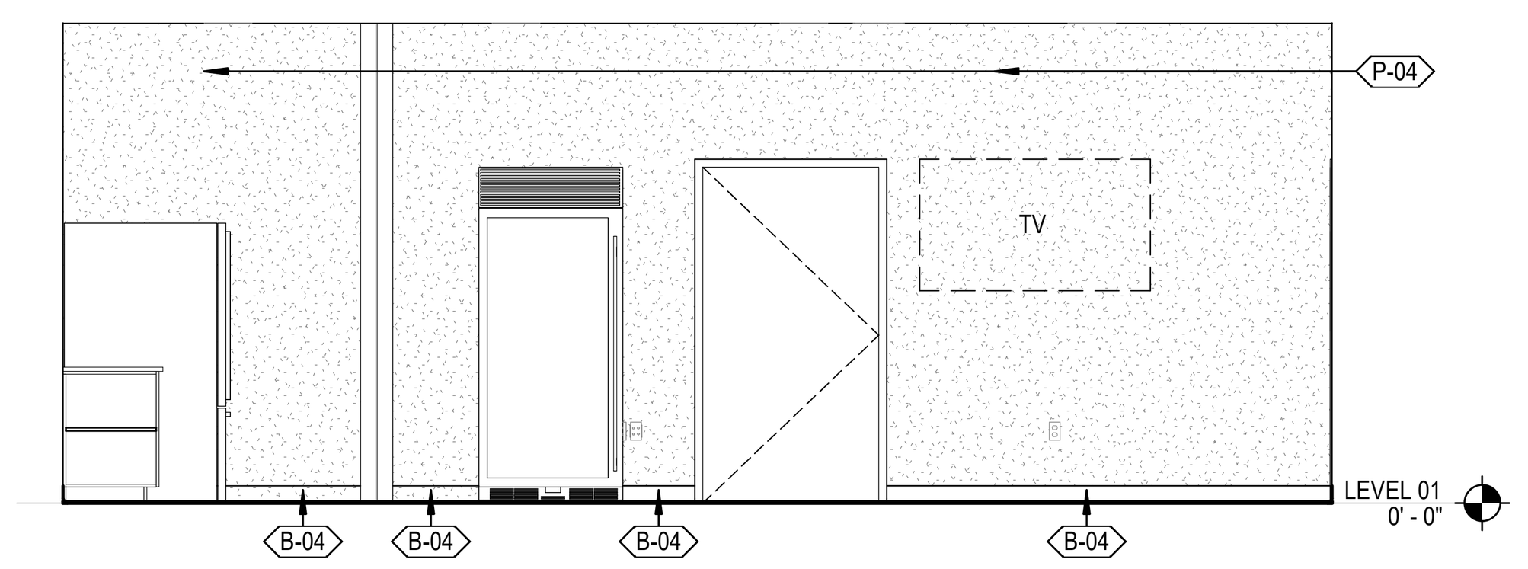
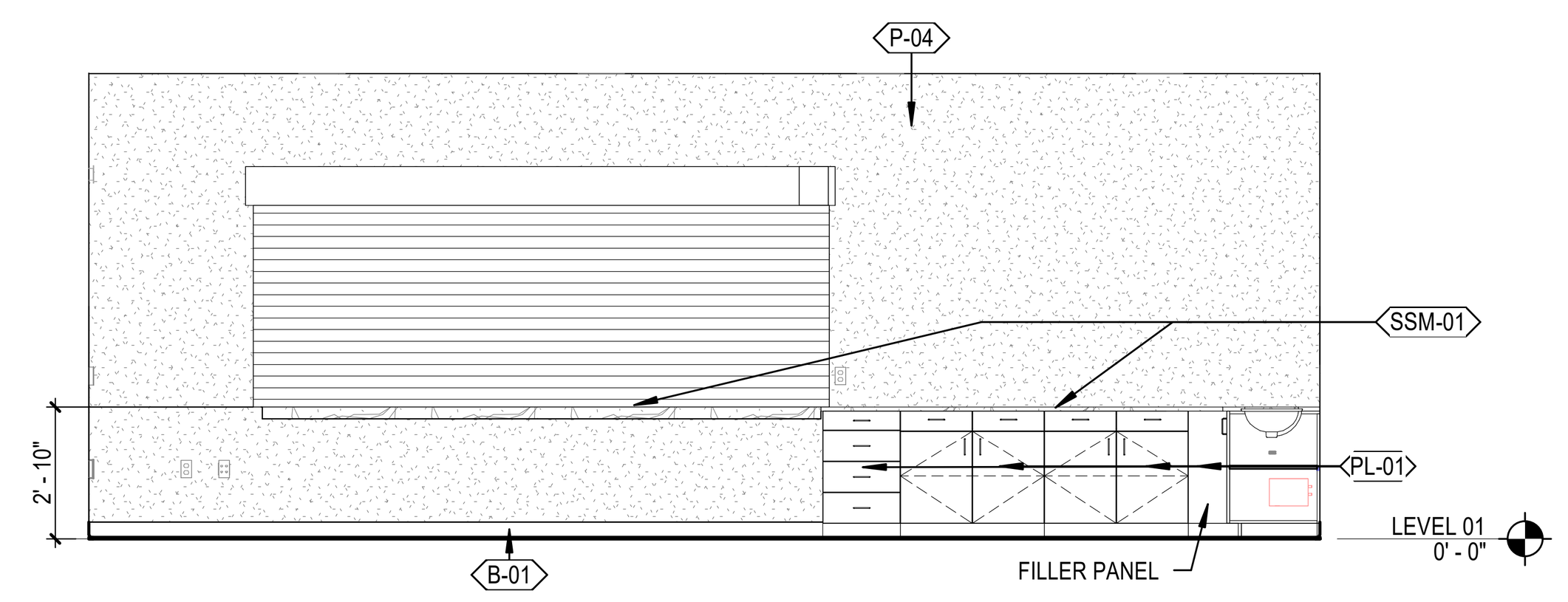
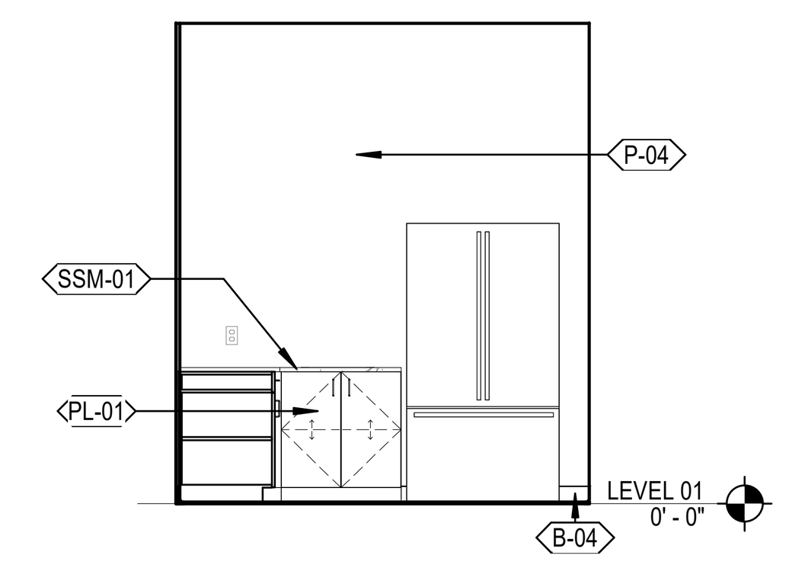


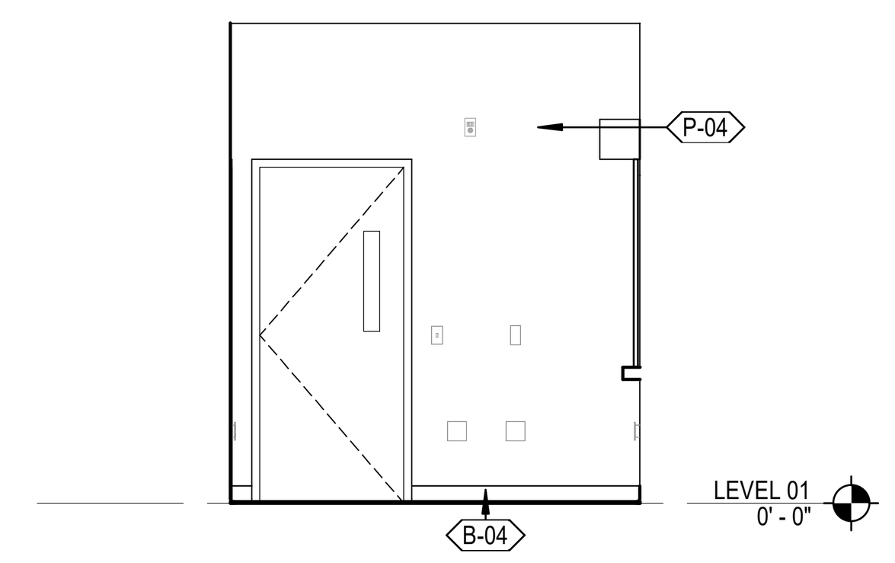
1A A10.5 A103 CONCESSION / BOX OFFICE NORTH ELEVATION
SCALE: 1/4" = 1'-0"



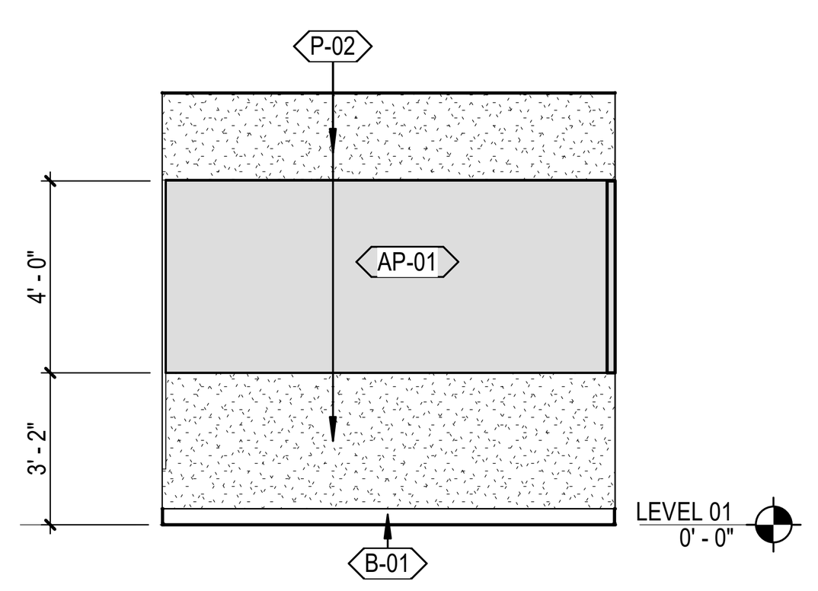
1B A10.5 A103 CONCESSIONS / BOX OFFICE SOUTH ELEVATION
SCALE: 1/4" = 1'-0"



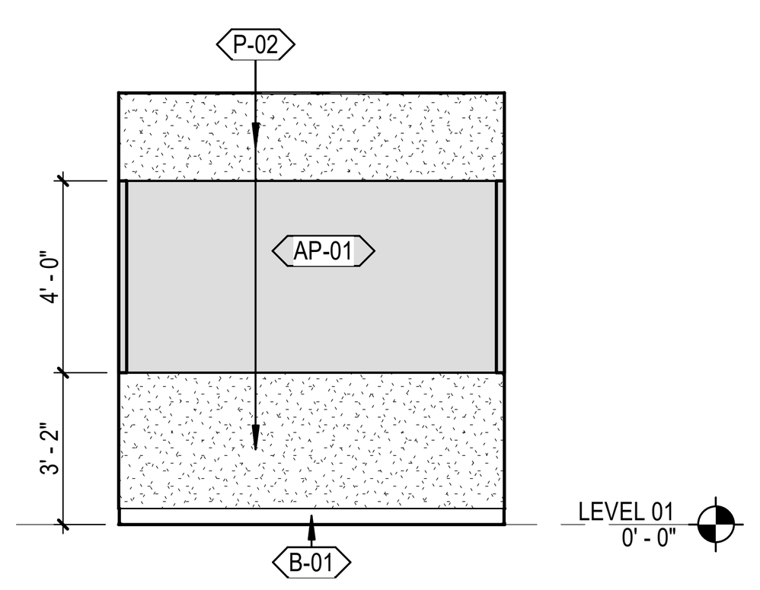
1D A10.5 A103 CONCESSION / BOX OFFICE WEST ELEVATION
SCALE: 1/4" = 1'-0"



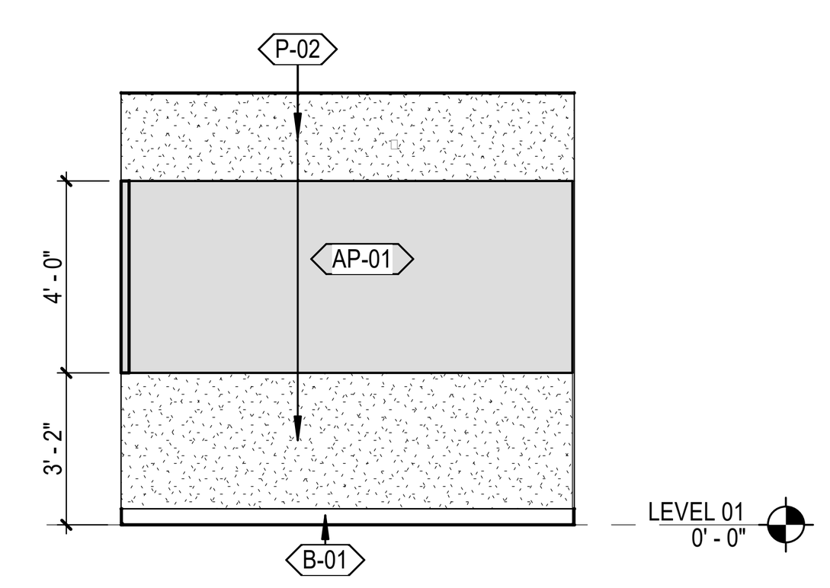
1E A10.5 A103 CONCESSION / BOX OFFICE EAST ELEVATION
SCALE: 1/4" = 1'-0"



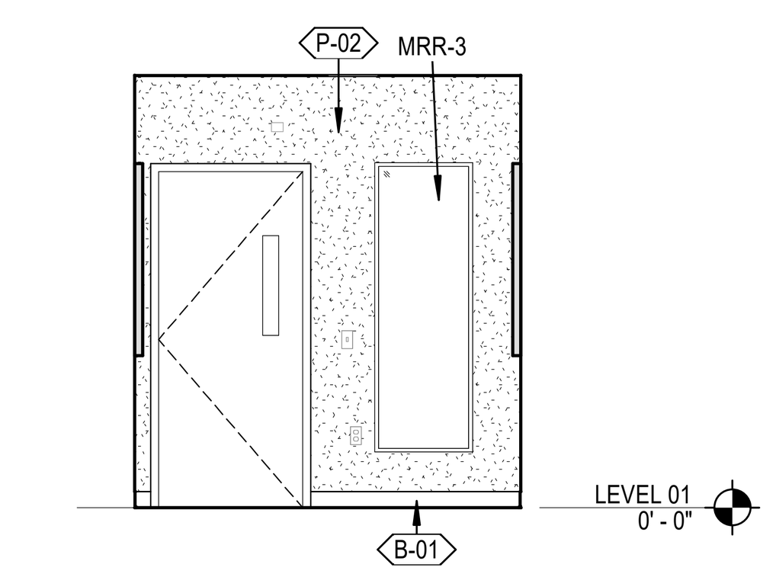
2A A10.5 A150 - SMALL PRACTICE - NORTH
SCALE: 1/4" = 1'-0"



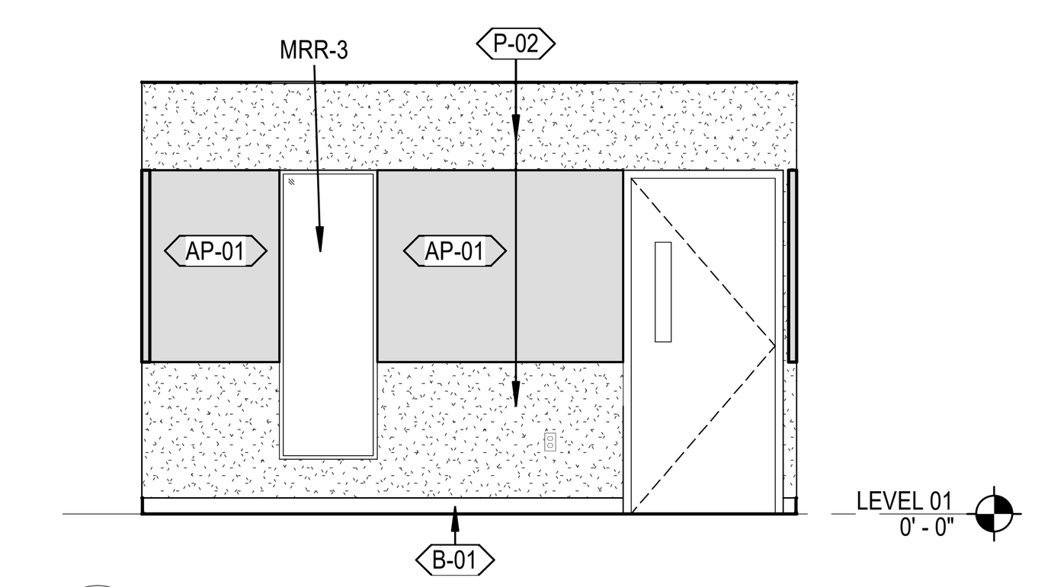
2B A10.5 A150 - SMALL PRACTICE - EAST
SCALE: 1/4" = 1'-0"



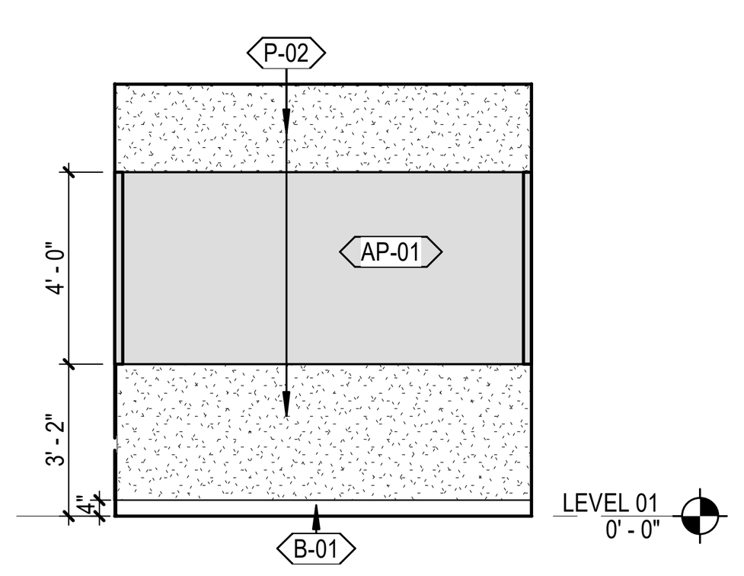
2C A10.5 A150 - SMALL PRACTICE - SOUTH
SCALE: 1/4" = 1'-0"



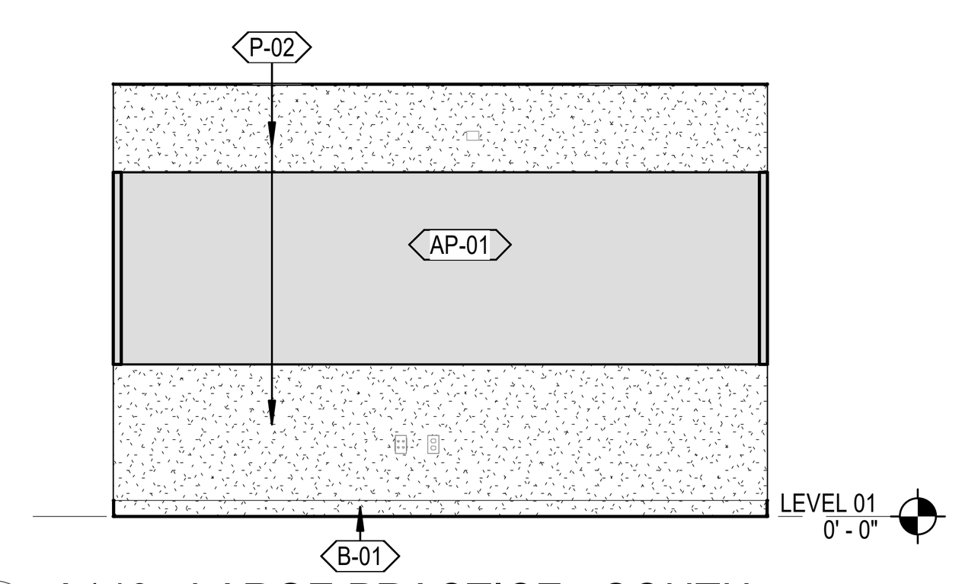
2D A10.5 A150 - SMALL PRACTICE - WEST
SCALE: 1/4" = 1'-0"



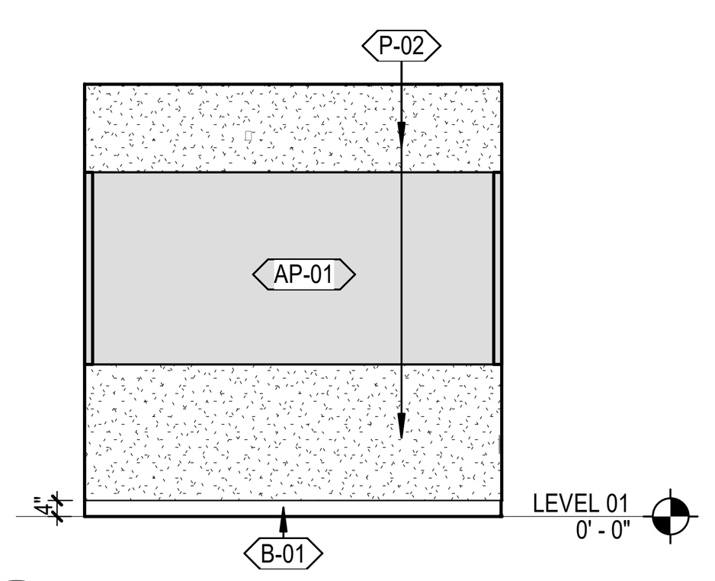
2E A10.5 A148 - LARGE PRACTICE - NORTH
SCALE: 1/4" = 1'-0"



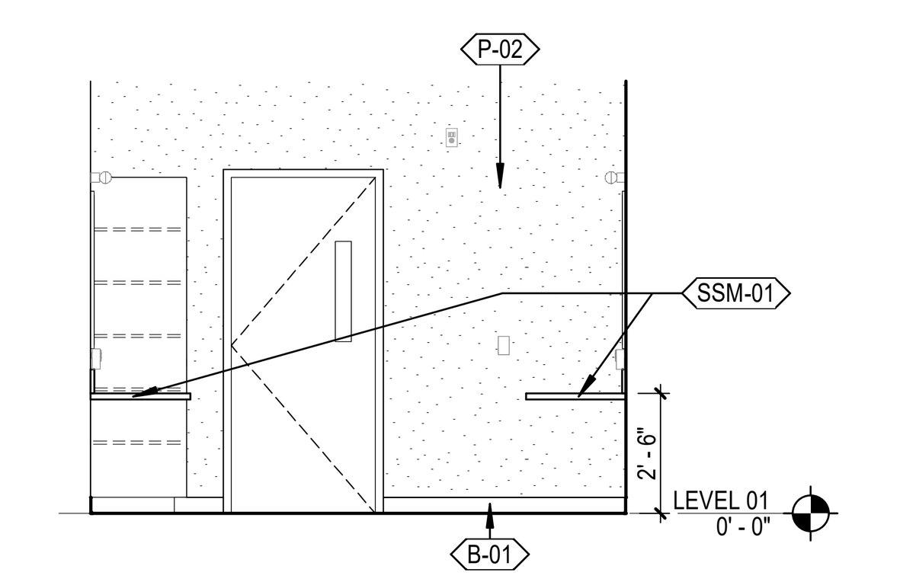
3A A10.5 A148 - LARGE PRACTICE - EAST
SCALE: 1/4" = 1'-0"



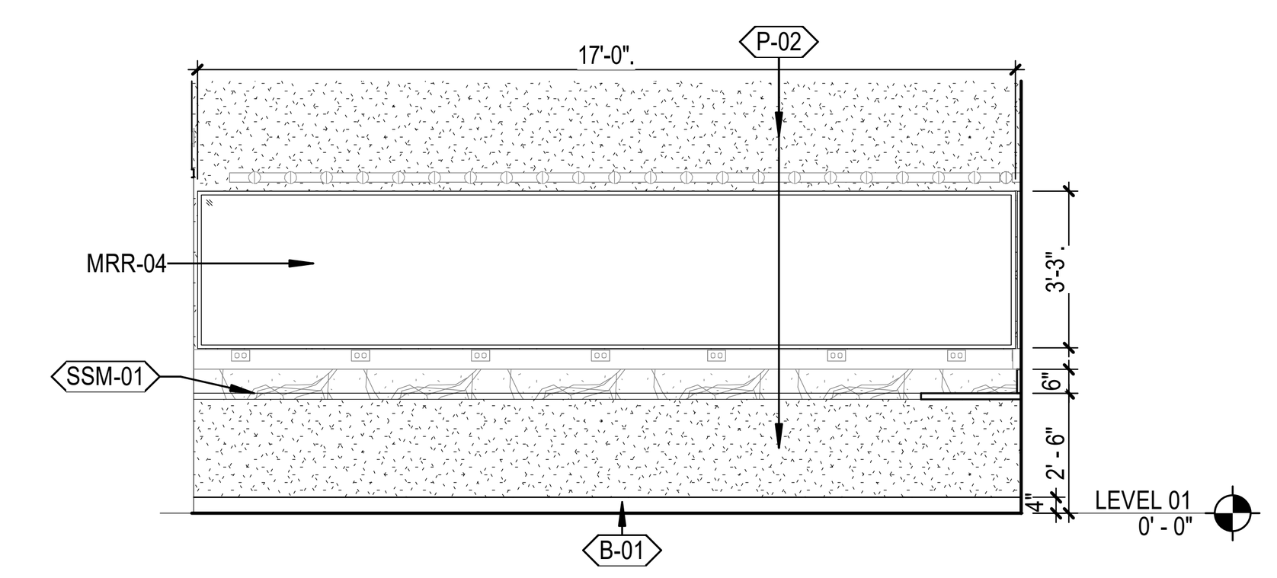
3B A10.5 A148 - LARGE PRACTICE - SOUTH
SCALE: 1/4" = 1'-0"



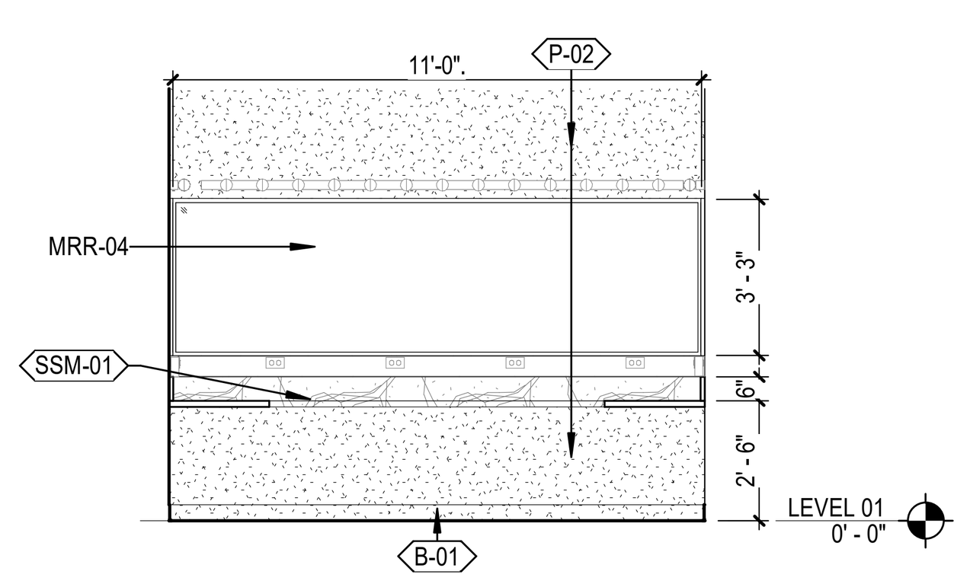
3C A10.5 A148 - LARGE PRACTICE - WEST
SCALE: 1/4" = 1'-0"



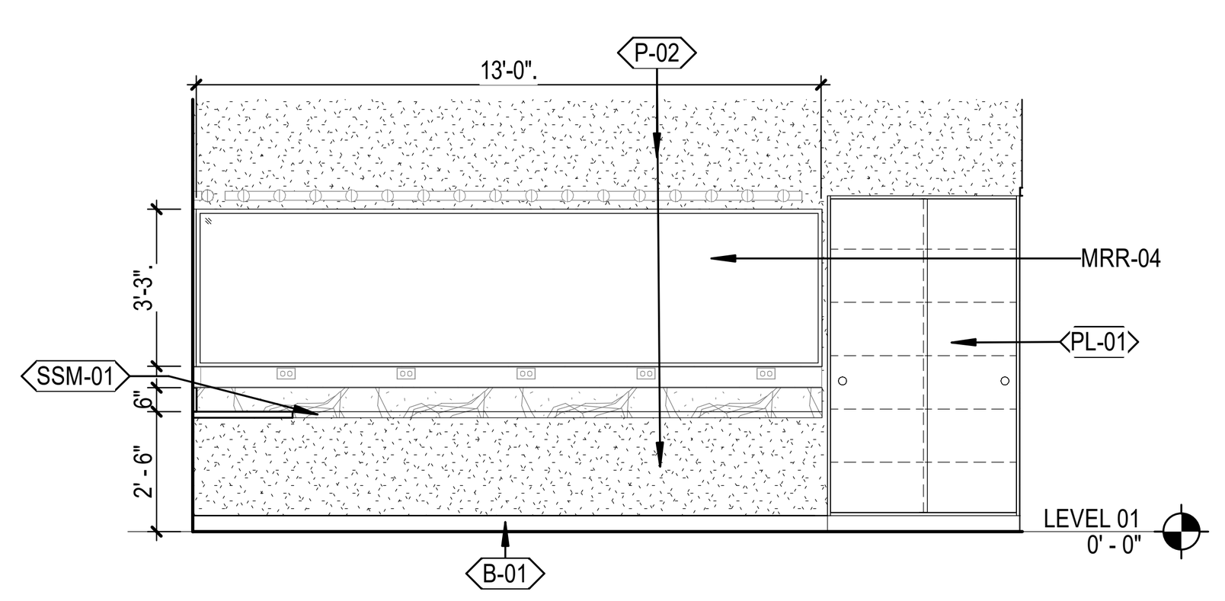
3D A10.5 A147 - MAKEUP - NORTH
SCALE: 1/4" = 1'-0"



3E A10.5 A147 - MAKEUP - EAST
SCALE: 1/4" = 1'-0"



4A A10.5 A147 - MAKEUP - SOUTH
SCALE: 1/4" = 1'-0"



4B A10.5 A147 - MAKEUP - WEST
SCALE: 1/4" = 1'-0"

REFERENCE KEYNOTES

MRR-3	MIRROR - TILT
MRR-04	

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INTERIOR ELEVATIONS

A10.5

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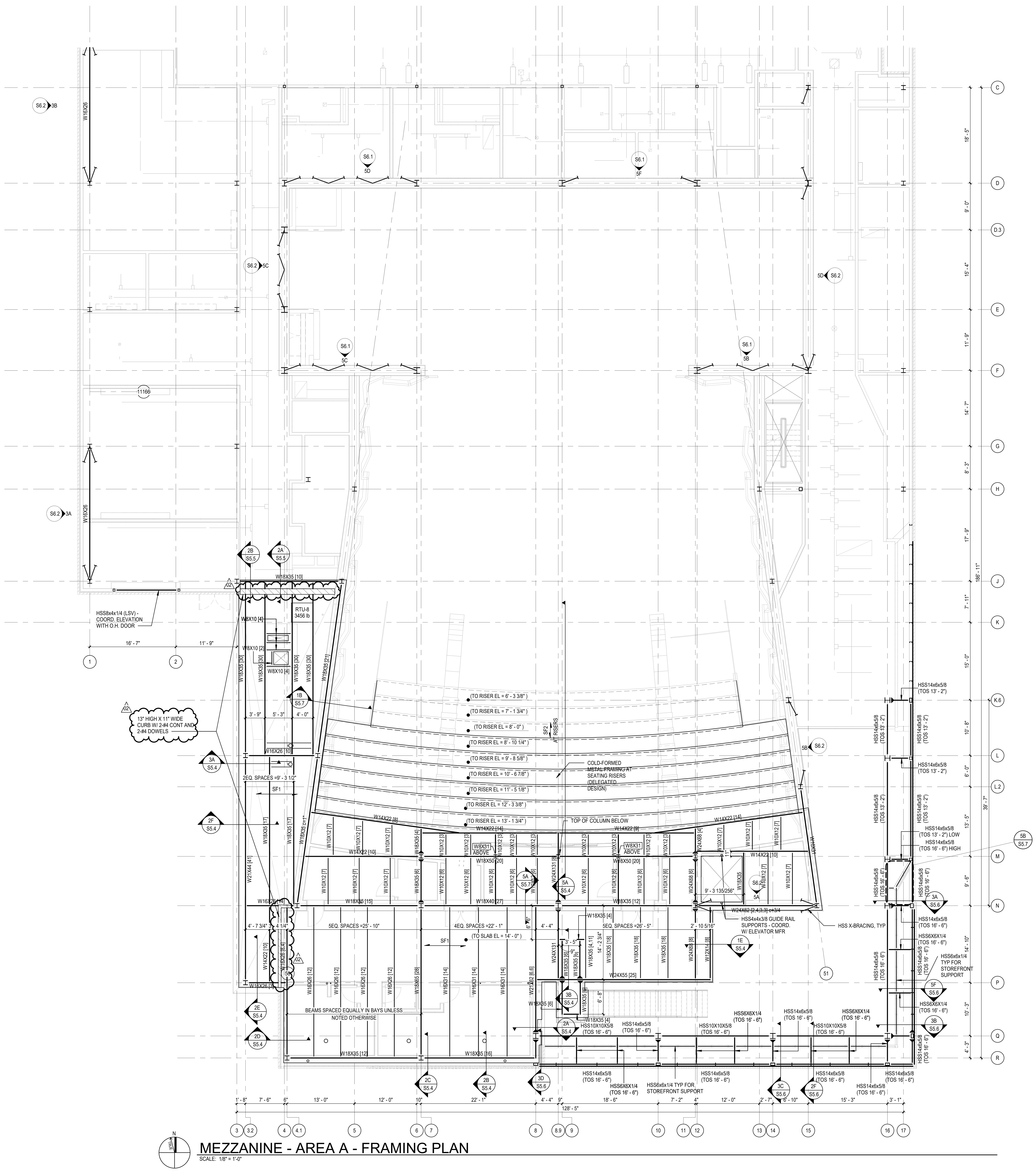

MEZZANINE - AREA A - FRAMING PLAN

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

FLOOR FRAMING PLAN GENERAL NOTES

A. SEE PLAN FOR TOP OF SLAB ELEVATIONS (TSE).
B. TOP OF STEEL (TOS) ELEVATION EQUAL TO BOTTOM OF SLAB ON DECK ELEVATION UNO.
C. BEAMS/JOISTS SHALL BE SPACED EVENLY BETWEEN NEAREST COLUMN LINES AND/OR LOCATED STRUCTURAL MEMBERS (WALLS, BEAMS) UNO.
D. SF1 = 4-1/2" NORMAL-WT CONCRETE OVER 2" COMPOSITE METAL DECK (20 GA, GALV). TOTAL SLAB t=6-1/2". REINF W/ 6x6-W2.9Xw2.9
E. SF2 = 3" NORMAL-WT CONCRETE OVER 2" COMPOSITE METAL DECK (20 GA, GALV). TOTAL SLAB t=5". REINF W/ 6x6-W2.9Xw2.9
F. SP1 = 3/8" STEEL PLATE
G. SR1 = 1-1/2" METAL ROOF DECK, TYPE B, 20 GA, GALV
H. STEEL ANGLES OR BENT PLS ARE REQUIRED AT ALL DECK PERIMETERS, EVEN WHEN NOT INDICATED. REFERENCE TYPICAL DETAILS.
I. STEEL MEMBERS AND CONNECTIONS EXPOSED TO THE WEATHER ARE TO BE GALVANIZED.

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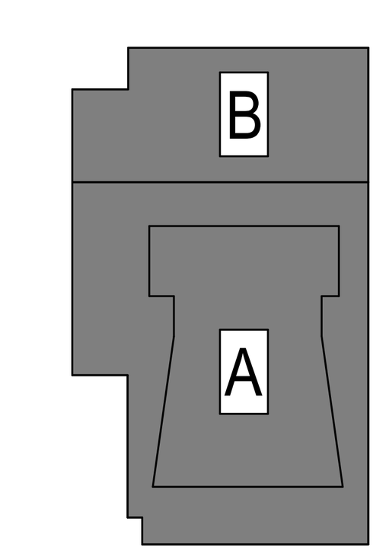
KEY PLAN



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LEVEL 02 MEZZANINE - AREA A - FRAMING PLAN

S1.2A

FLOOR FRAMING PLAN GENERAL NOTES

A. SEE PLAN FOR TOP OF SLAB ELEVATIONS (TSE).
B. TOP OF STEEL (TOS) ELEVATION EQUAL TO BOTTOM OF SLAB ON DECK ELEVATION UNO.
C. BEAMS/JOISTS SHALL BE SPACED EVENLY BETWEEN NEAREST COLUMN LINES AND/OR LOCATED STRUCTURAL MEMBERS (WALLS, BEAMS) UNO.
D. SF1 = 4-1/2" NORMAL-WT CONCRETE OVER 2" COMPOSITE METAL DECK (20 GA. GALV). TOTAL SLAB t=6-1/2". REINF W/ 6x6-W2.9xW2.9
E. SF2 = 3" NORMAL-WT CONCRETE OVER 3" COMPOSITE METAL DECK (20 GA. GALV). TOTAL SLAB t=9". REINF W/ 6x6-W2.9xW2.9
F. SP1 = 3/8" STEEL PLATE
G. SR1 = 1-1/2" METAL ROOF DECK, TYPE B, 20 GA. GALV
H. STEEL ANGLES OR BENT PLS ARE REQUIRED AT ALL DECK PERIMETERS, EVEN WHEN NOT INDICATED. REFERENCE TYPICAL DETAILS.
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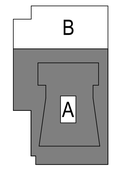

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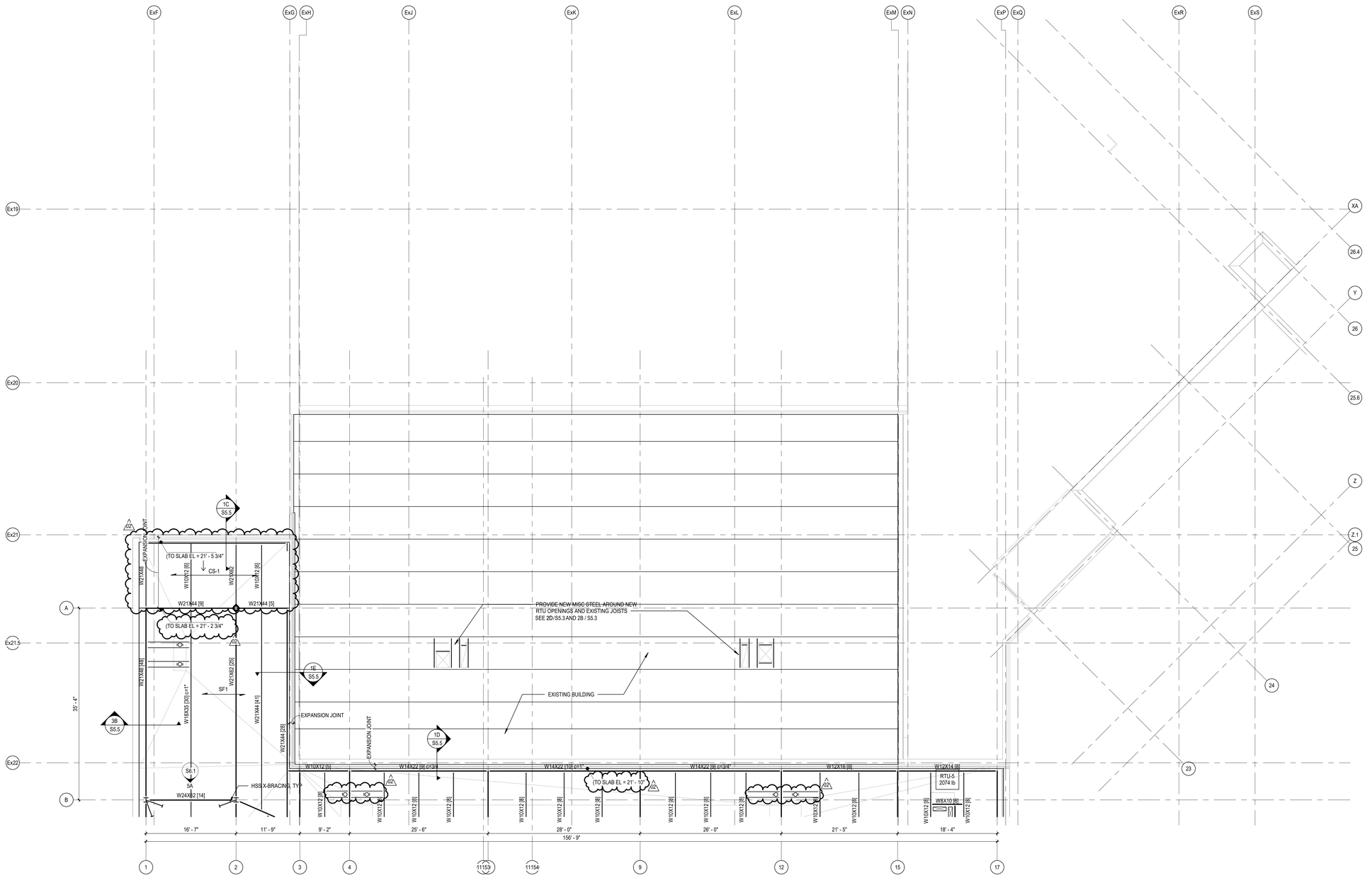
LEVEL 03
CATWALK - AREA A - FRAMING PLAN

S2.3A

CATWALK - AREA A - FRAMING PLAN

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



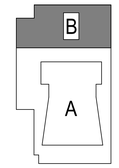
LEVEL 03 CATWALK - AREA B - FRAMING PLAN

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

FLOOR FRAMING PLAN GENERAL NOTES

A. SEE PLAN FOR TOP OF SLAB ELEVATIONS (TSE).
B. TOP OF STEEL (TOS) ELEVATION EQUAL TO BOTTOM OF SLAB ON DECK ELEVATION UNO.
C. BEAMS/JOISTS SHALL BE SPACED EVENLY BETWEEN NEAREST COLUMN LINES AND/OR LOCATED STRUCTURAL MEMBERS (WALLS, BEAMS) UNO.
D. SF1 = 4-1/2" NORMAL-WT CONCRETE OVER 2" COMPOSITE METAL DECK (20 GA. GALV). TOTAL SLAB t=6-1/2". REINF W/ 6x6-W2.9XW2.9
E. SF2 = 3" NORMAL-WT CONCRETE OVER 3" COMPOSITE METAL DECK (20 GA. GALV). TOTAL SLAB t=5". REINF W/ 6x6-W2.9XW2.9
F. SP1 = 3/8" STEEL PLATE
G. SR1 = 1-1/2" METAL ROOF DECK, TYPE B, 20 GA. GALV
H. STEEL ANGLES OR BENT PLS ARE REQUIRED AT ALL DECK PERIMETERS, EVEN WHEN NOT INDICATED. REFERENCE TYPICAL DETAILS.
I. STEEL MEMBERS AND CONNECTIONS EXPOSED TO THE WEATHER ARE TO BE GALVANIZED.

KEY PLAN



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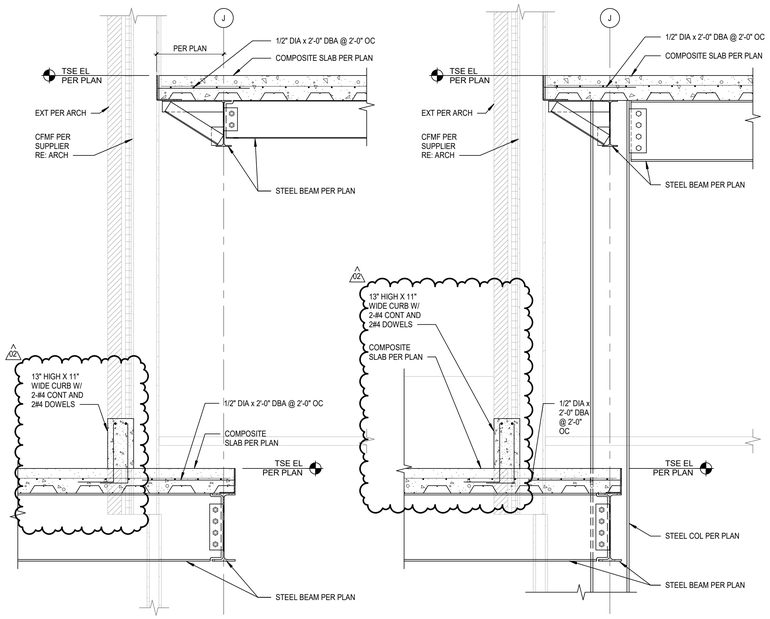
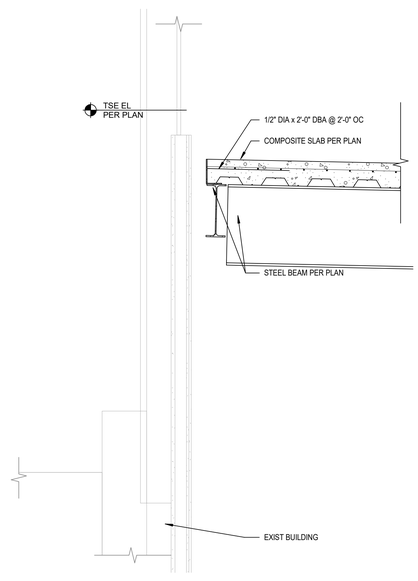
LEVEL 03 CATWALK - AREA B - FRAMING PLAN

S2.3B

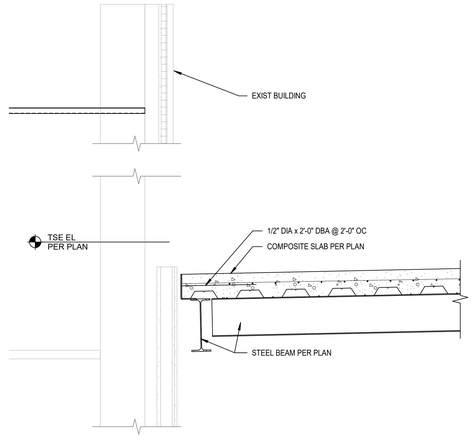


2A S5.5 SECTION AT ROOF STEP
SCALE: 3/4" = 1'-0"

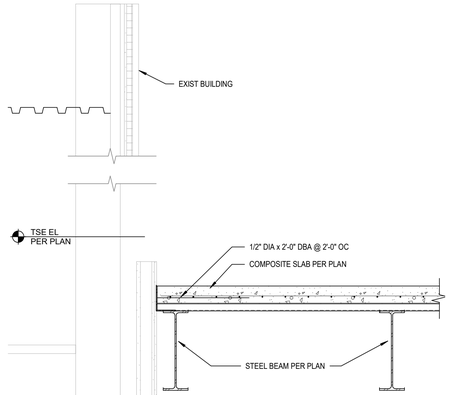
2B S5.5 SECTION AT ROOF STEP
SCALE: 3/4" = 1'-0"



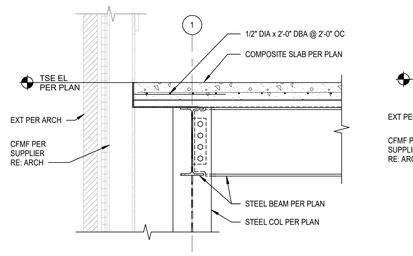
1C S5.5 SECTION AT ROOF NEAR EXISTING BUILDING
SCALE: 3/4" = 1'-0"



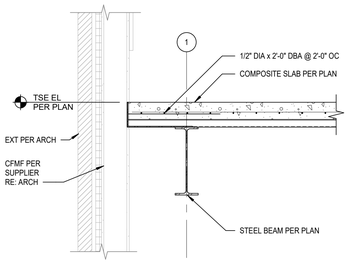
1D S5.5 SECTION AT ROOF NEAR EXISTING BUILDING
SCALE: 3/4" = 1'-0"



1E S5.5 SECTION AT ROOF NEAR EXISTING BUILDING
SCALE: 3/4" = 1'-0"



3A S5.5 SECTION AT ROOF
SCALE: 3/4" = 1'-0"



3B S5.5 SECTION AT ROOF
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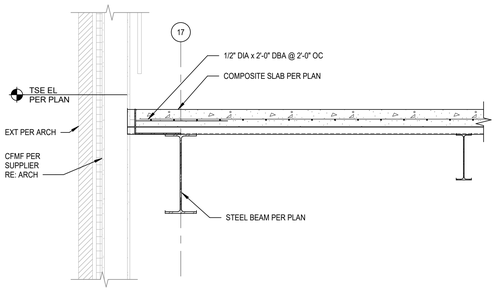

3C S5.5 SECTION AT ROOF
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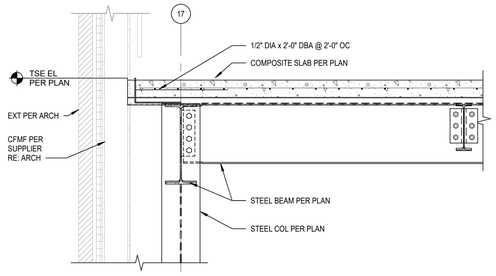
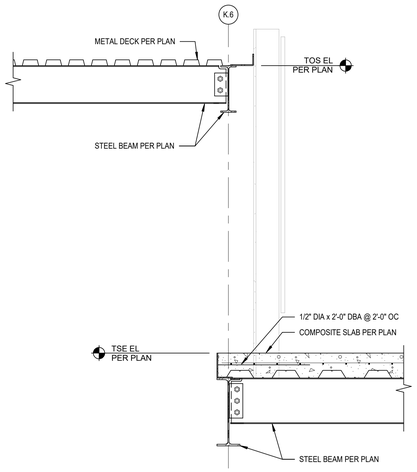


3D S5.5 SECTION AT ROOF
SCALE: 3/4" = 1'-0"



4A S5.5 SECTION AT ROOF STEP
SCALE: 3/4" = 1'-0"

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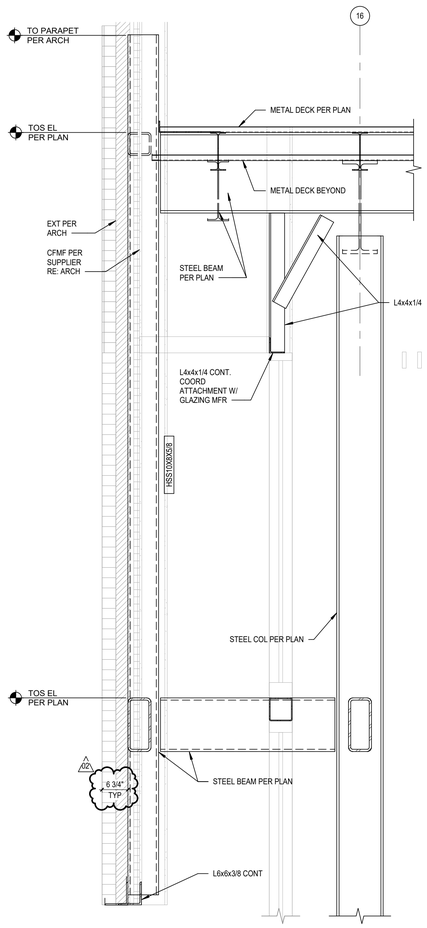
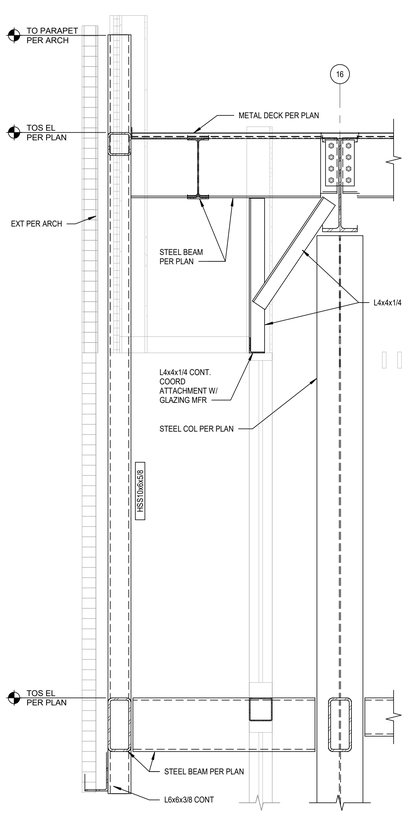
STEEL SECTIONS

S5.5



3A SECTION AT LOBBY ROOF
S5.6 SCALE: 3/4" = 1'-0"



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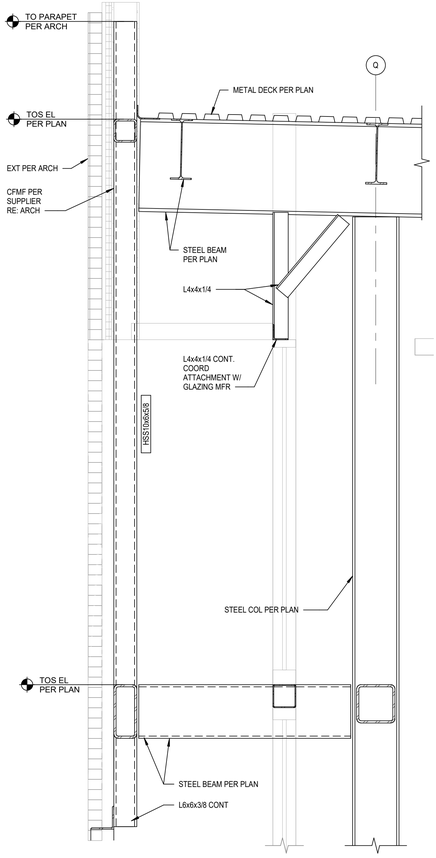

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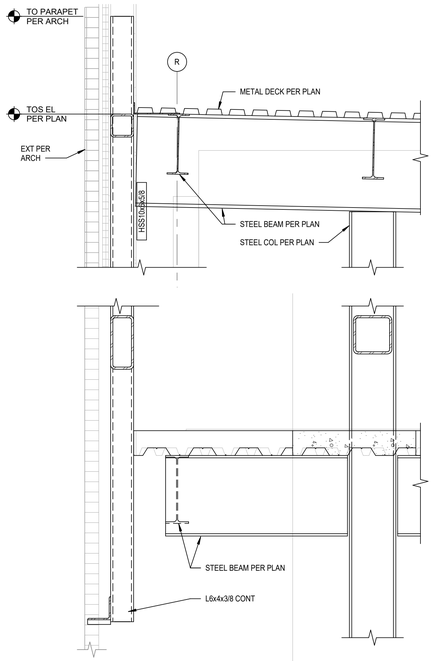
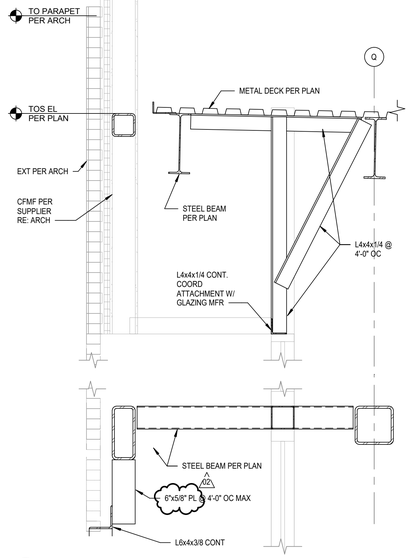
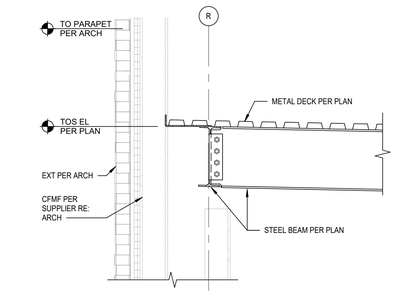


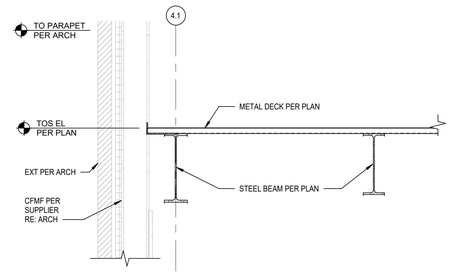
3D SECTION AT LOBBY ROOF
S5.6 SCALE: 3/4" = 1'-0"



2F SECTION AT LOBBY ROOF
S5.6 SCALE: 3/4" = 1'-0"



3F SECTION AT LOBBY ROOF
S5.6 SCALE: 3/4" = 1'-0"



4D SECTION AT LOBBY ROOF
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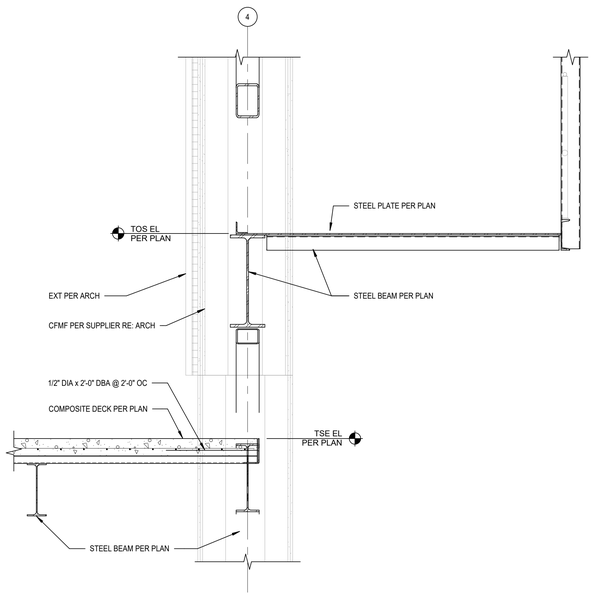
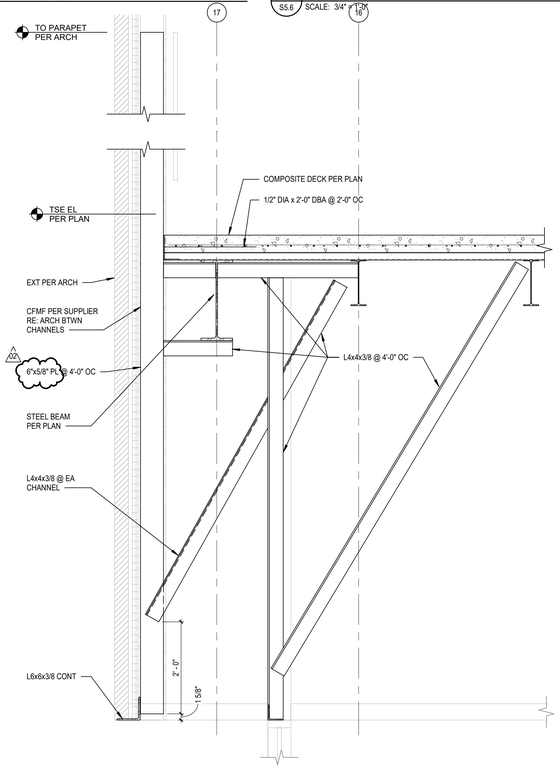
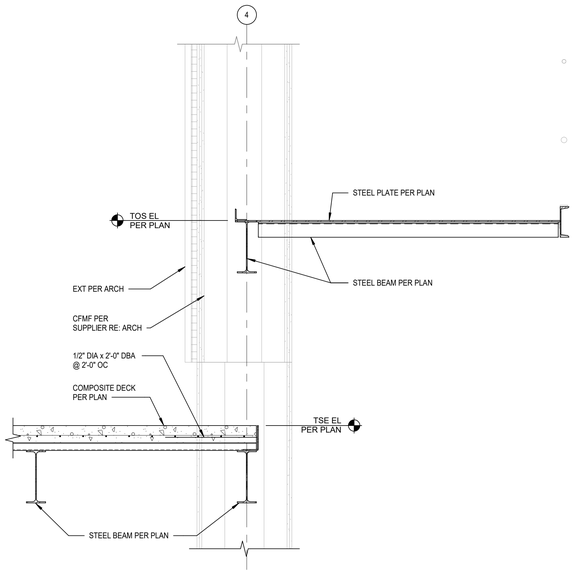


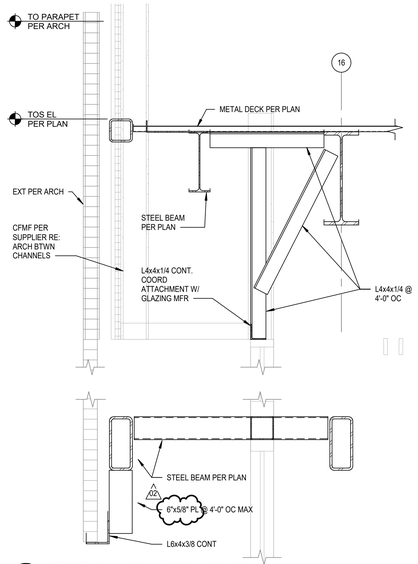
5A SECTION AT CATWALK
S5.6 SCALE: 3/4" = 1'-0"



5B SECTION AT BRICK SUPPORT
S5.6 SCALE: 3/4" = 1'-0"



5D SECTION AT CATWALK
S5.6 SCALE: 3/4" = 1'-0"



5F SECTION AT LOBBY ROOF
S5.6 SCALE: 3/4" = 1'-0"

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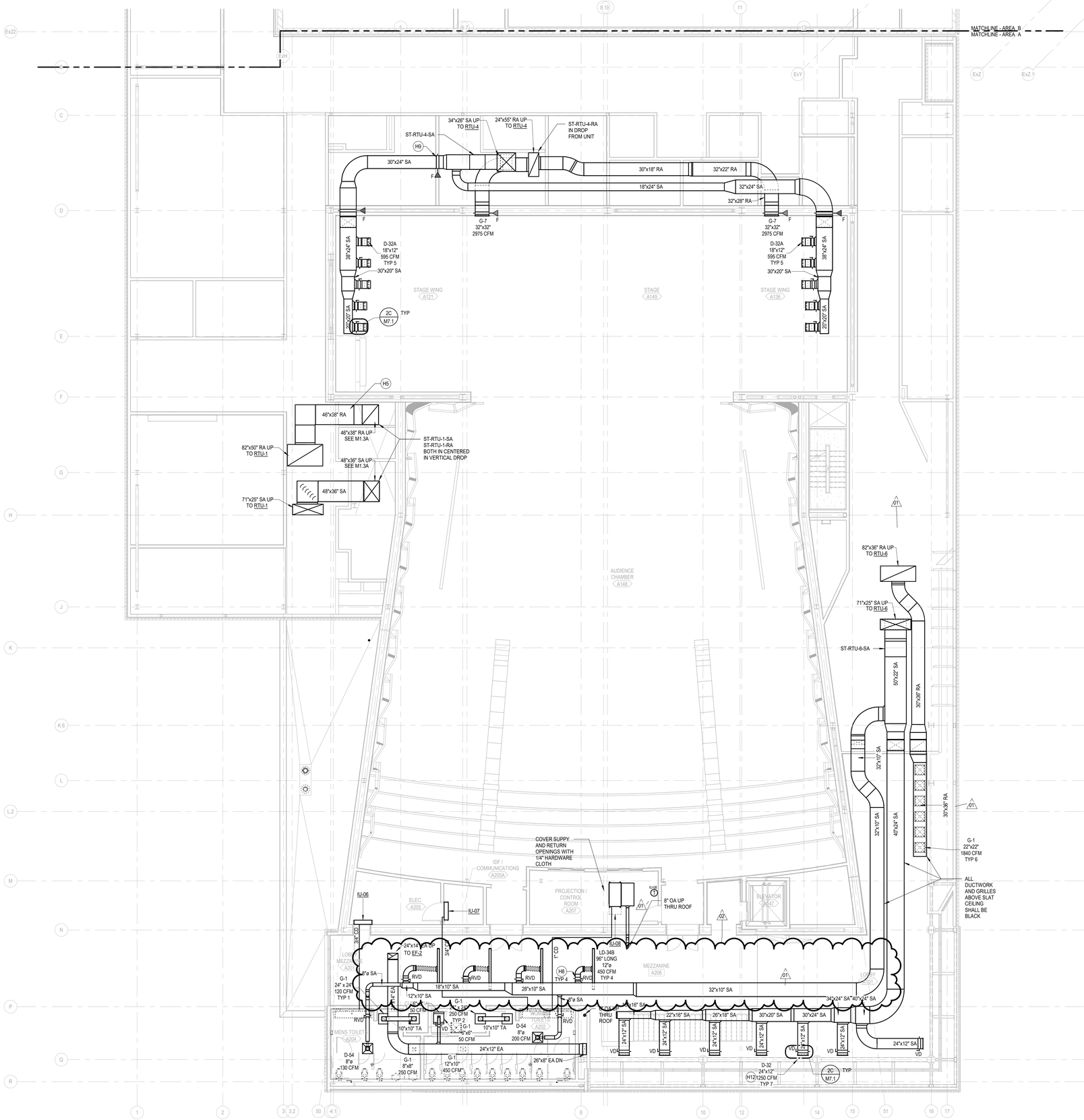
STEEL SECTIONS

S5.6



LEVEL 02 MEZZANINE - AREA A - HVAC PLAN

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

GENERAL NOTES

A. FOR SYMBOLS AND ABBREVIATIONS SEE SHEETS M0.1 AND M0.2.

B. COORDINATE SPACE TEMPERATURE SENSORS AND THERMOSTAT LOCATIONS TO ALIGN VERTICALLY WITH LIGHT SWITCHES. MOUNT A MINIMUM OF 8" FROM LIGHT SWITCH.

C. FINAL LOCATIONS OF ALL AIR DEVICES SHALL BE COORDINATED WITH ARCHITECTURAL CEILING FINISHES.

D. ALL DUCT SIZE NOTES REFER TO CLEAR INSIDE DIMENSION OF DUCT.

E. FLEXIBLE DUCT SHALL NOT BE LONGER THAN 6'-0".

F. PROVIDE VOLUME DAMPERS FOR ALL SUPPLY, RETURN, AND EXHAUST.

G. FIRE SEAL AROUND DUCT AND PIPING PENETRATIONS OF FIRE RATED WALLS.

H. FOR DIFFUSERS OR GRILLES IN IN-ACCESSIBLE CEILINGS, PROVIDE BALANCE DAMPERS WITH ABILITY TO BE REMOTELY ADJUSTED.

I. EXPOSED ROUND DUCTS OF DIAMETER 10 INCHES OR LARGER TO BE SPIRAL WOUND.

J. PROVIDE ALL NEW CONTROLS CAPABLE OF TOTAL INTEGRATION WITH EXISTING BUILDING AUTOMATION SYSTEM THROUGH CLIMATECH. THE NEW SYSTEM SHALL PROVIDE USER ACCESS TO ALL SYSTEM DATA BOTH LOCALLY OVER A SECURE INTRANET WITHIN THE BUILDING AND BY REMOTE ACCESS BY A STANDARD WEB BROWSER OVER THE INTERNET. THIS WILL INCLUDE HVAC CONTROLS, ENERGY MANAGEMENT, ALARM MONITORING, AND ALL TRENDING/REPORTING FUNCTIONS RELATED TO NORMAL BUILDING OPERATIONS.

K. ROUTE REFRIGERANT PIPING FROM OUTDOOR UNITS TO ASSOCIATED INDOOR UNITS. REFER TO MANUFACTURER'S INSTRUCTIONS FOR SIZES AND MAX LENGTHS.

SHEET NOTES

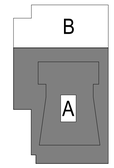
H5 38"X28" RA UP, CONNECTING TO 46"X38" RA. SEE M1.2A FOR CONTINUATION.

H8 REMOTE ACTUATED VOLUME DAMPER. PROVIDE YOUNG REGULATOR 270-275 OR APPROVED EQUIVALENT. MOUNT ACTUATOR IN PLENUM OF CORRESPONDING LINEAR DIFFUSER.

H9 PROVIDE FIRE DAMPER FOR BOTH SUPPLY AND RETURN PENETRATION THROUGH WALL.

H12 ADJUST GRILLE TO THROW DOWN AT 30 DEGREES.

KEY PLAN



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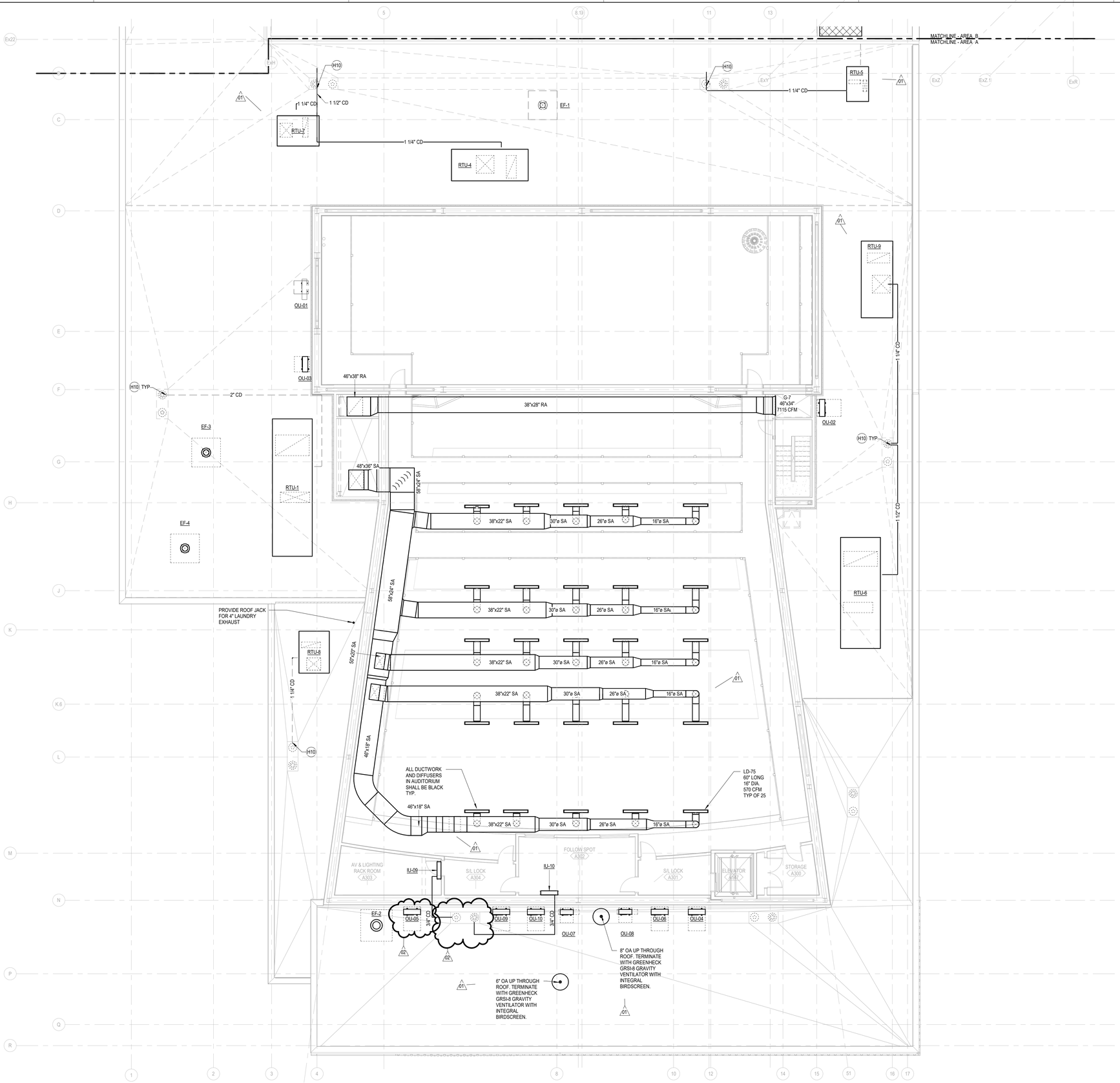
LEVEL 02 MEZZANINE - AREA A - HVAC PLAN

M1.2MA



GENERAL NOTES

A. FOR SYMBOLS AND ABBREVIATIONS SEE SHEETS M0.1 AND M0.2.

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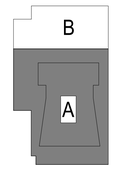
K. ROUTE REFRIGERANT PIPING FROM OUTDOOR UNITS TO ASSOCIATED INDOOR UNITS. REFER TO MANUFACTURER'S INSTRUCTIONS FOR SIZES AND MAX LENGTHS.

SHEET NOTES

H10 ROUTE CONDENSATE LINE TO NEAREST ROOF DRAIN AND TERMINATE WITH 1" AIR GAP.

KEY PLAN



LEVEL 03 - AREA A - ROOF MECHANICAL PLAN

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

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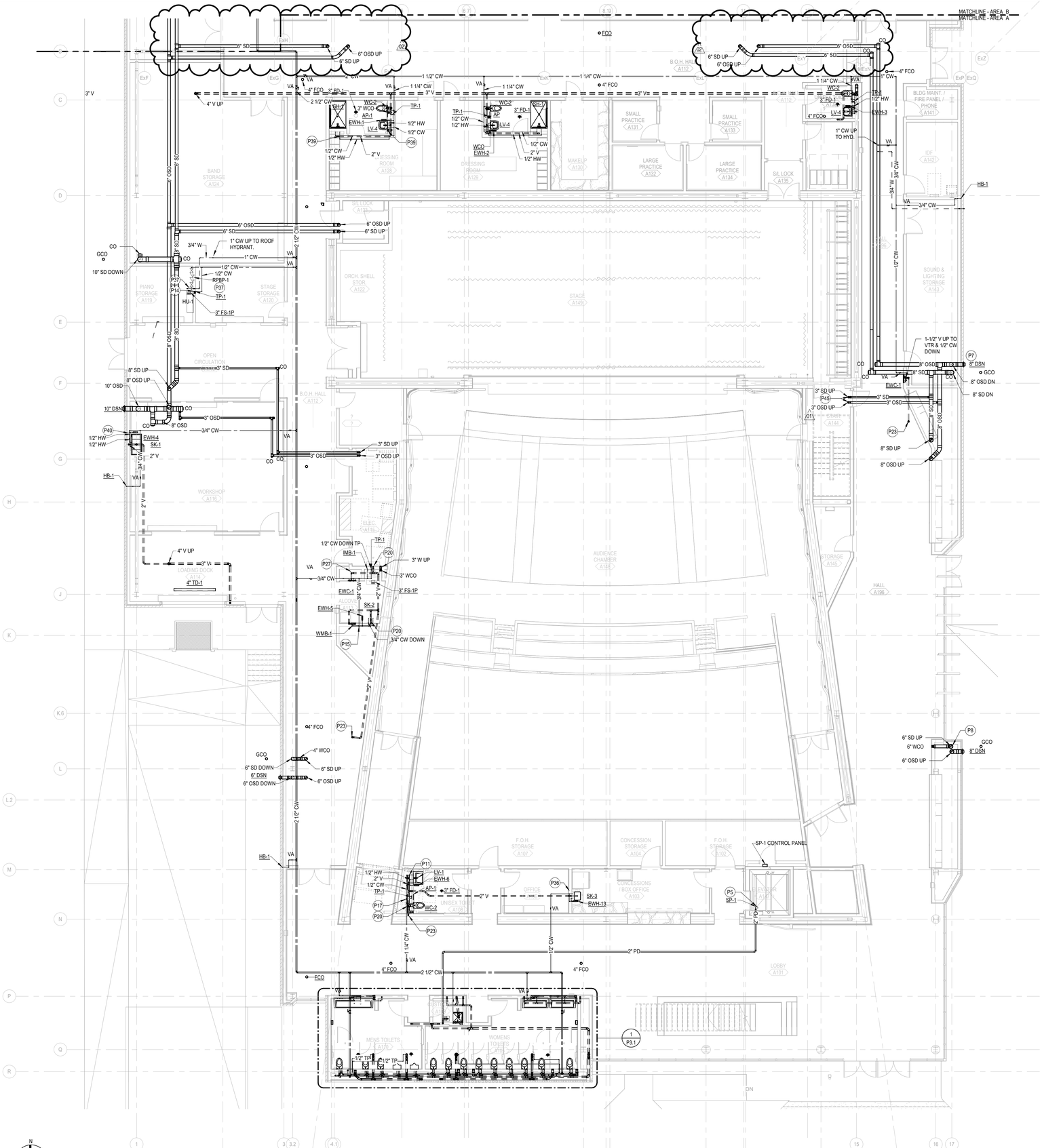
2024.07.25
REVISIONS

01	08/19/2024	ADDENDUM 01
02	09/03/2024	ADDENDUM 02

39-23712-00

LEVEL 03 - AREA A - ROOF MECHANICAL PLAN

M1.3A



LEVEL 01 - AREA A - PLUMBING PLAN

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

PLUMBING GENERAL NOTES

A FOR SYMBOLS AND ABBREVIATIONS SEE DRAWINGS P0.1 & P.02.

B BEFORE COMMENCEMENT OF WORK, THE CONTRACTOR SHALL VERIFY THE EXACT LOCATIONS, ELEVATIONS AND CHARACTERISTICS OF ALL UTILITIES AND PIPING BY PHYSICAL EXCAVATION AND SHALL IMMEDIATELY NOTIFY THE ARCHITECT OF ANY DISCREPANCIES.

C THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITIES AND POINTS OF CONNECTION PRIOR TO BIDDING PROJECT.

D ALL UNDERGROUND SANITARY AND STORM PIPING SHALL BE SUPPORTED BY AN APPROVED SUSPENSION SYSTEM DESIGNED FOR VERTICAL EXPANSION FOR THE UNDERLYING SOIL.

SHEET NOTES

P5 PROVIDE SUMP PUMP FOR ELEVATOR SHAFT PIT AND DISCHARGE INTO FLOOR SINK.

P7 TERMINATE OVERFLOW STORM DRAIN OUTSIDE BUILDING WITH A LAMB'S TONGUE 12" ABOVE FINISHED FLOOR.

P8 SEE CIVIL SHEETS FOR CONTINUATION.

P11 4" W UP.

P14 1/2" CW DOWN.

P15 3/4" CW DOWN.

P17 1-1/4" CW DOWN TO SHUTOFF VALVE BEHIND ACCESS PANEL.

P20 2" VENT DOWN. TYPICAL.

P23 2" VENT UP.

P27 1-1/2" VENT DOWN. TYPICAL.

P36 2" V AND 1/2" CW DOWN.

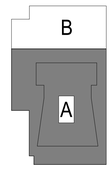
P37 1/2" REDUCED PRESSURE ZONE BACKFLOW PREVENTER ON HUMIDIFIER SUPPLY. 48" AFF. SECURE TO WALL. RELIEF DISCHARGE TO FLOOR SINK.

P39 1/2" HW DOWN.

P40 LOCATE WATER PIPING TO THE INTERIOR SIDE (WARMSIDE) OF THE WALL INSULATION TO PROTECT FROM FREEZING TEMPERATURE.

P45 PROVIDE CAST IRON PIPING IN RETURN AIR PLENUM.

KEY PLAN



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09/03/2024
TBPE FIRM REGISTRATION NUMBER F-1101

CRANDALL ISD HIGH SCHOOL
PAC ADDITION
13385 Fm 3039, Crandall, TX 75114

ISSUE FOR BID AND PERMIT
2024.07.25
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01	08/19/2024	ADDENDUM 01
02	09/03/2024	ADDENDUM 02

39-23712-00

LEVEL 01 - AREA A - PLUMBING PLAN

P2.1A

LEVEL 01 - AREA B - PLUMBING PLAN

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

PLUMBING GENERAL NOTES

A FOR SYMBOLS AND ABBREVIATIONS SEE DRAWINGS P0.1 & P.02.

B BEFORE COMMENCEMENT OF WORK, THE CONTRACTOR SHALL VERIFY THE EXACT LOCATIONS, ELEVATIONS AND CHARACTERISTICS OF ALL UTILITIES AND PIPING BY PHYSICAL EXCAVATION AND SHALL IMMEDIATELY NOTIFY THE ARCHITECT OF ANY DISCREPANCIES.

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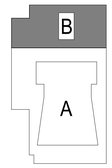
D ALL UNDERGROUND SANITARY AND STORM PIPING SHALL BE SUPPORTED BY AN APPROVED SUSPENSION SYSTEM DESIGNED FOR VERTICAL EXPANSION FOR THE UNDERLYING SOIL.

SHEET NOTES

P6 EXTEND AND CONNECT TO EXISTING 2-1/2" DOMESTIC COLD WATER LINE. REMOVE AND REPLACE EXISTING VALVE WITH NEW. FIELD VERIFY EXACT LOCATION.

KEY PLAN



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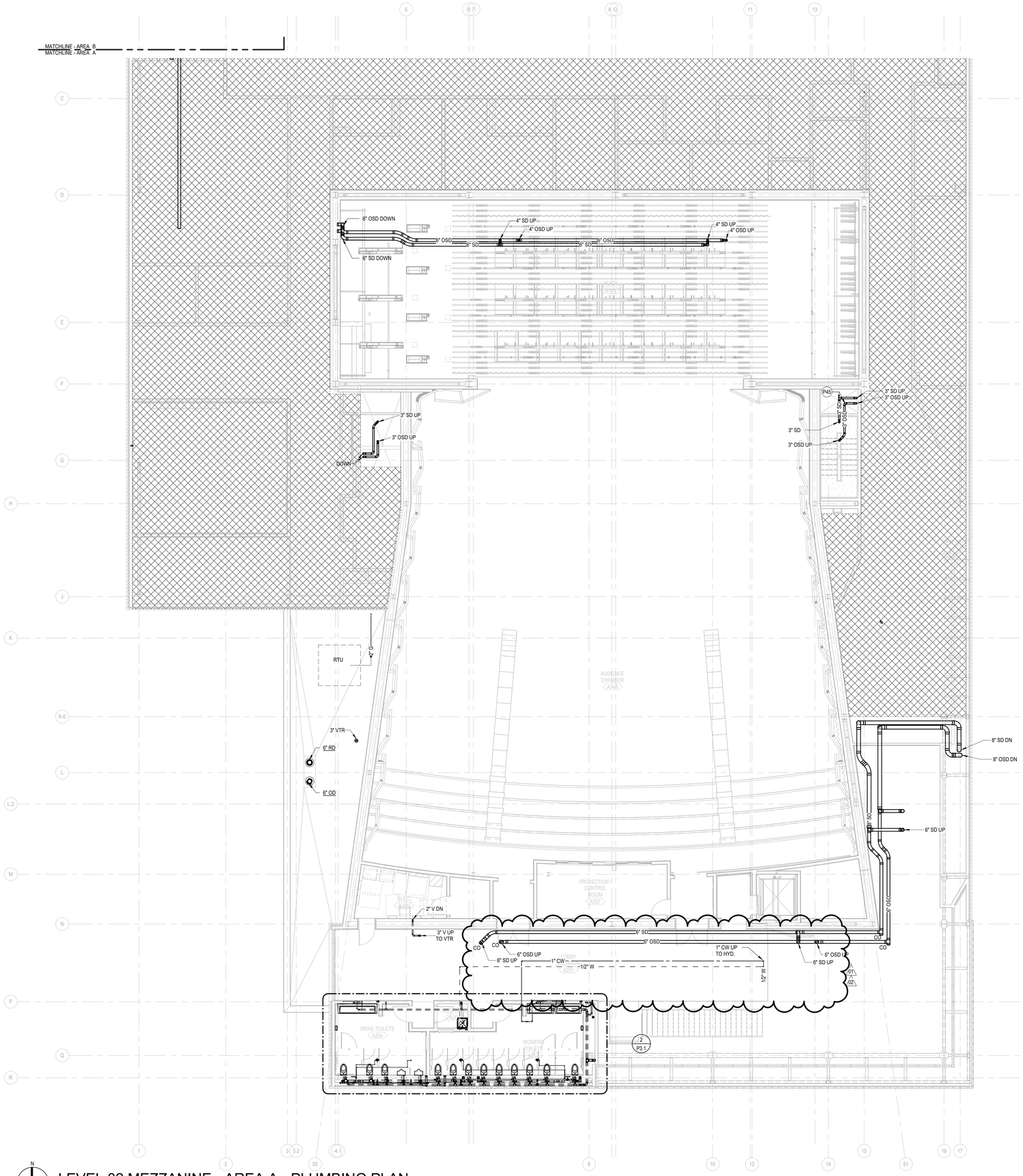
LEVEL 01 - AREA B - PLUMBING PLAN

P2.1B



N

LEVEL 02 MEZZANINE - AREA A - PLUMBING PLAN

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

PLUMBING GENERAL NOTES

A FOR SYMBOLS AND ABBREVIATIONS SEE DRAWINGS P0.1 & P.02.

B BEFORE COMMENCEMENT OF WORK, THE CONTRACTOR SHALL VERIFY THE EXACT LOCATIONS, ELEVATIONS AND CHARACTERISTICS OF ALL UTILITIES AND PIPING BY PHYSICAL EXCAVATION AND SHALL IMMEDIATELY NOTIFY THE ARCHITECT OF ANY DISCREPANCIES.

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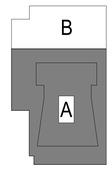
D ALL UNDERGROUND SANITARY AND STORM PIPING SHALL BE SUPPORTED BY AN APPROVED SUSPENSION SYSTEM DESIGNED FOR VERTICAL EXPANSION FOR THE UNDERLYING SOIL.

SHEET NOTES

P45 PROVIDE CAST IRON PIPING IN RETURN AIR PLENUM.

KEY PLAN



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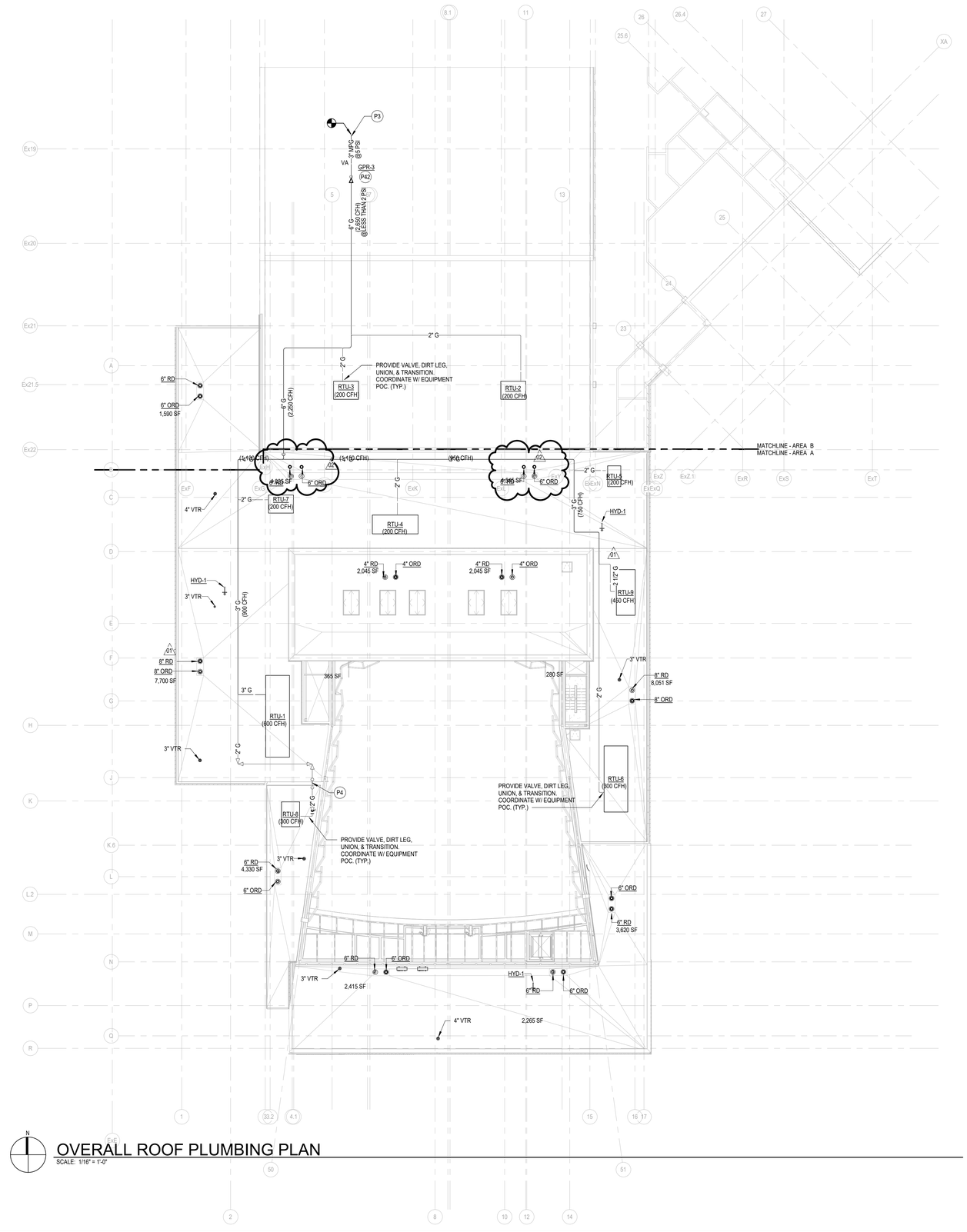
LEVEL 02 MEZZANINE - AREA A - PLUMBING PLAN

P2.2MA



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OVERALL ROOF PLUMBING PLAN

SCALE: 1/16" = 1'-0"

PLUMBING GENERAL NOTES

A FOR SYMBOLS AND ABBREVIATIONS SEE DRAWINGS P0.1 & P.02.

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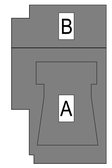
SHEET NOTES

P3 P.O.C. NEW 6" G LINE WITH SHUT-OFF VALVE AND GAS PRESSURE REGULATOR TO EXISTING MPG LINE ON EXISTING ROOF. VERIFY DOWNSTREAM EQUIPMENT PRESSURE REQUIREMENT WITH MANUFACTURER PRIOR SETTING REGULATOR MAXIMUM PRESSURE. FIELD VERIFY POINTS OF CONNECTION PRIOR TO INSTALLATION OF ANY PIPING.

P4 GAS PIPING UP AND OVER PARAPET. TYPICAL.

P42 SET OUTLET PSI TO EQUIPMENTS MANUFACTURER'S RECOMMENDED PSI

KEY PLAN



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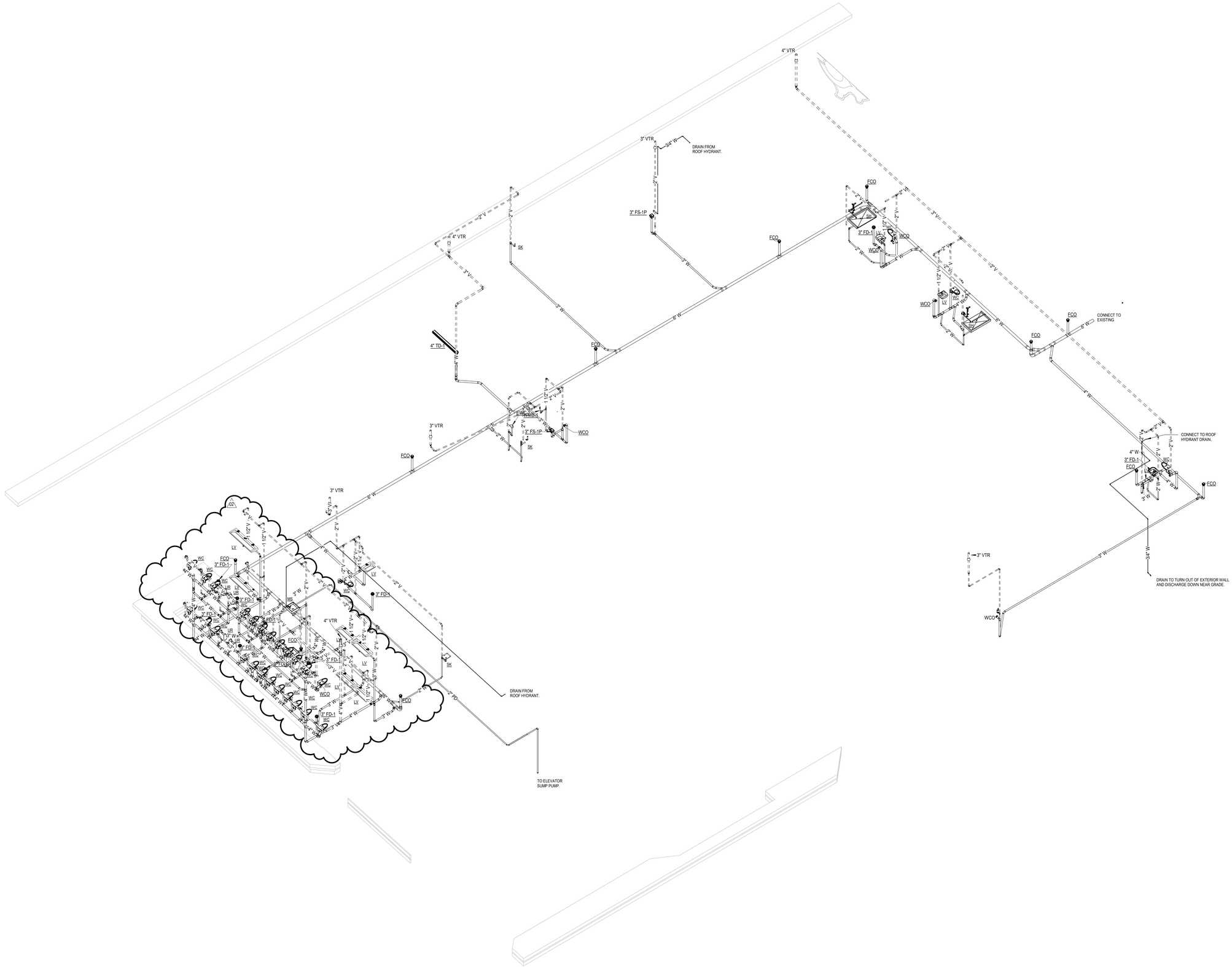
OVERALL ROOF PLUMBING PLAN

P2.3



WASTE & VENT RISER DIAGRAM

SCALE:

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WASTE & VENT RISER DIAGRAMS

P4.1

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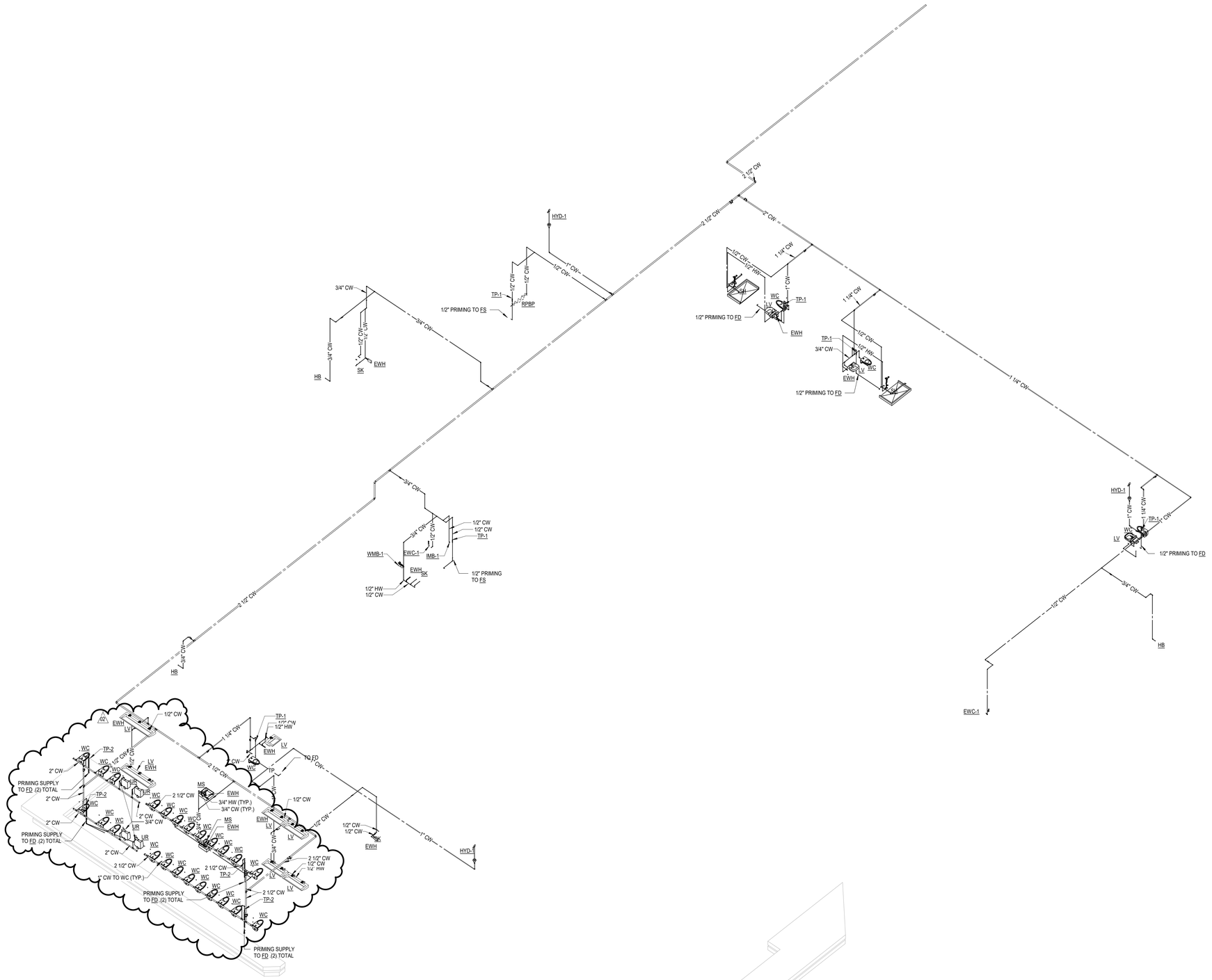

DOMESTIC WATER RISER DIAGRAM

SCALE:

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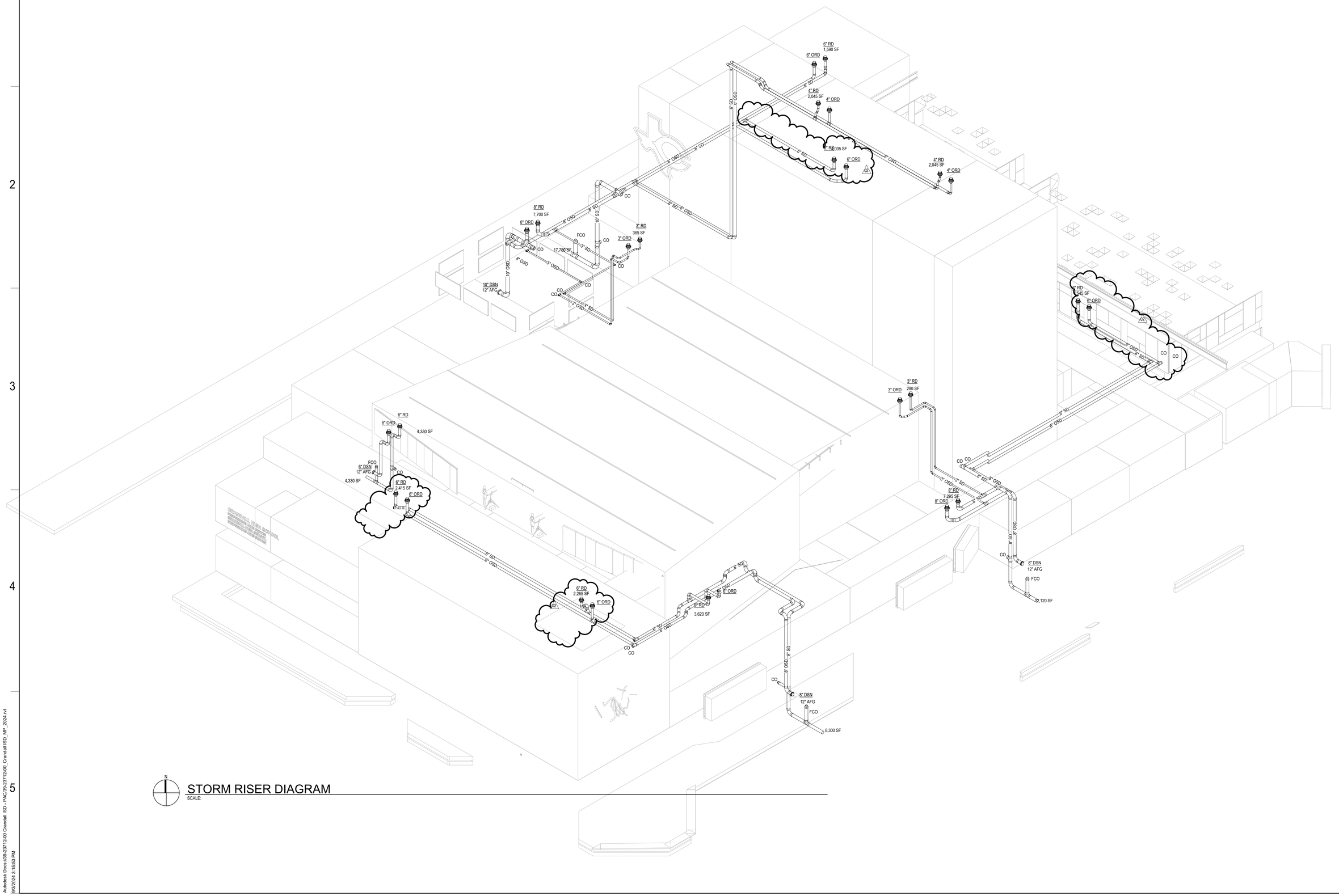
DOMESTIC RISER DIAGRAM

P4.2



N

STORM RISER DIAGRAM

SCALE:

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STORM RISER DIAGRAM

P4.3

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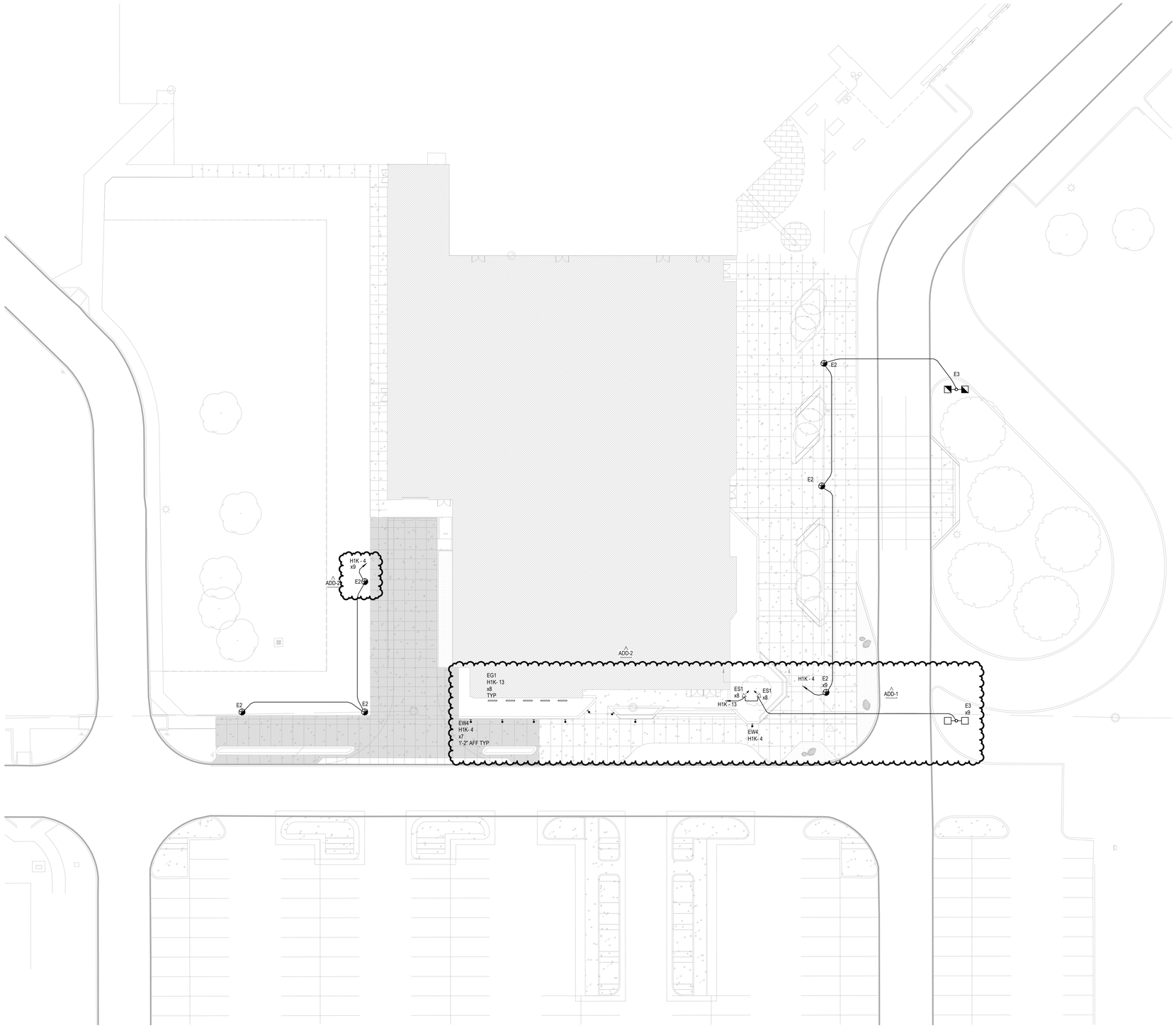

N

ELECTRICAL SITE PLAN

SCALE: 1" = 20'-0"

SHEET NOTES

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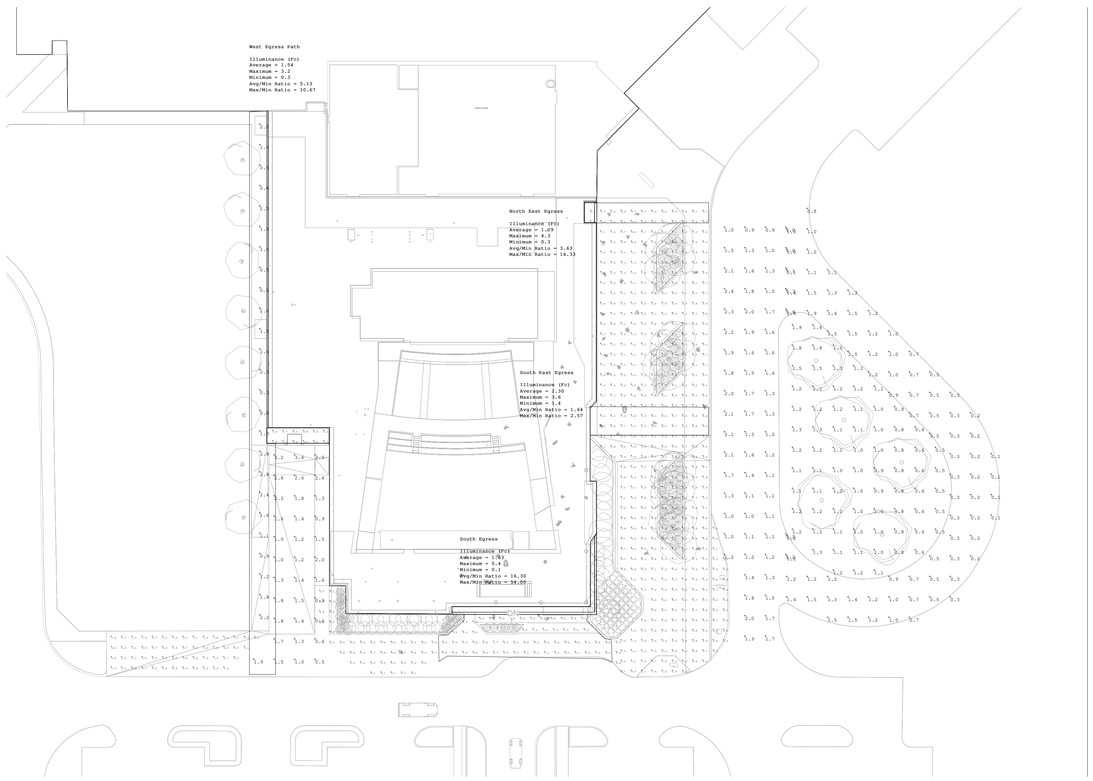
ELECTRICAL SITE PLAN

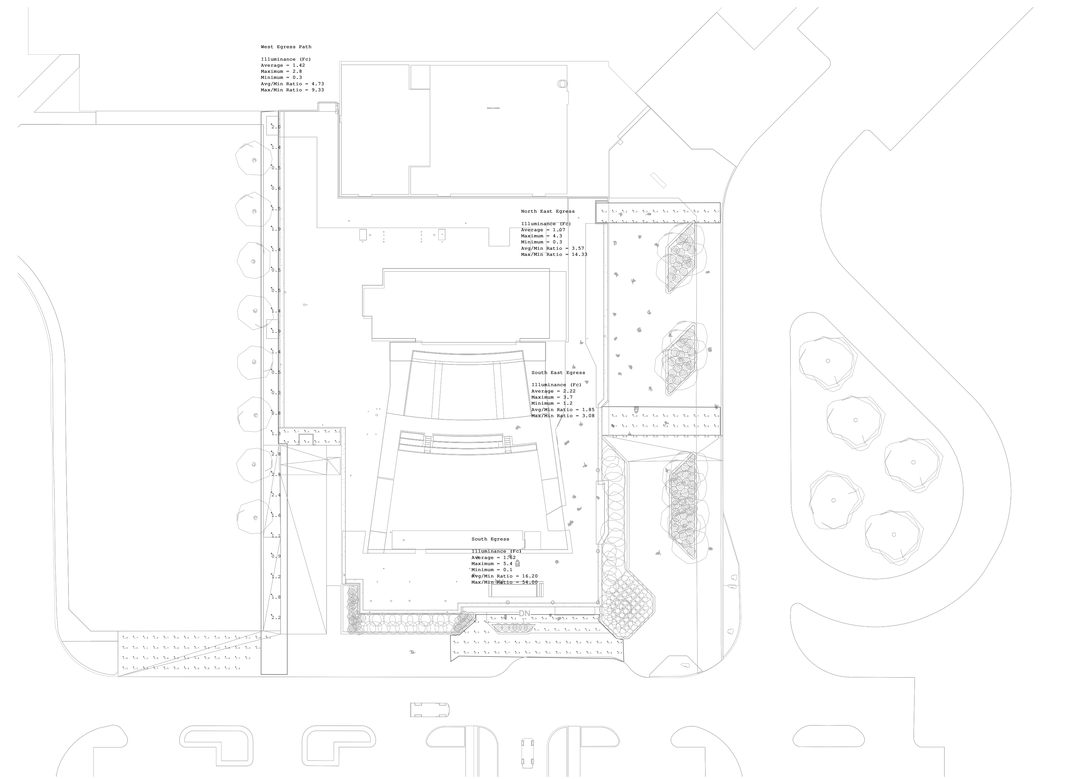
ES1.1



N

SITE LIGHTING EGRESS CALCULATIONS

SCALE: 1" = 30'-0"



N

SITE LIGHTING EMERGENCY CALCULATIONS

SCALE: 1" = 30'-0"

ADD-2 ADD-1 ADD-1

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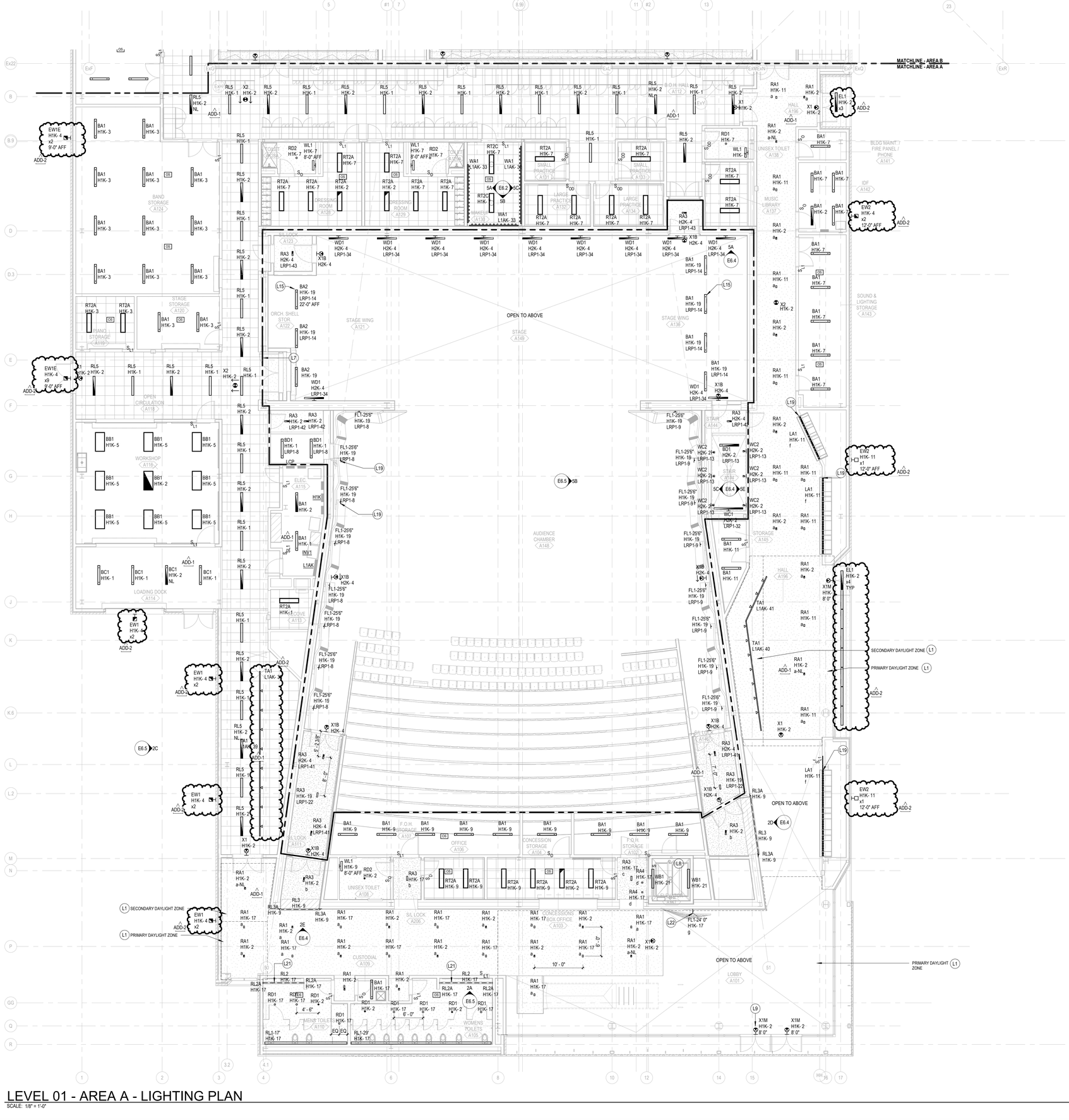
SITE LIGHTING PHOTOMETRICS

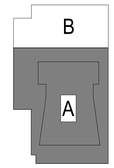
ES1.2



SHEET NOTES

- L1 GENERAL LIGHTING IN DAYLIGHT ZONES IS LESS THAN 150 WATTS. DAYLIGHT RESPONSIVE CONTROLS NOT REQUIRED PER 2021 IECC C408.
- L7 LIGHTING WITHIN BOUNDARY CONTROLLED BY THEATRICAL LIGHTING CONTROL SYSTEM. COORDINATE WITH QT SERIES SHEETS.
- L8 MOUNT SWITCH IN SHAFT AT 42" ABOVE LEVEL 1 FINISHED FLOOR. SWITCH CONTROLS LIGHTS IN ELEVATOR PIT. MOUNT LIGHT FIXTURES 6" ABOVE LEVEL 1 FINISHED FLOOR.
- L9 MOUNTED ABOVE MULLION, TYPICAL
- L15 TYP. MOUNT TO UNDERSIDE OF CATWALK.
- L19 SEE MOUNTING DETAIL 5A/A11.10. IN ARCHITECTURAL DRAWINGS. MOUNT FIXTURE SO THAT ASYMMETRIC OPTICS POINT AWAY FROM THE WALL.
- L21 TYPICAL FOR RL2 & RL2A. PROVIDE A CONTINUOUS PORTAL. BOTTOM OF VERTICAL SECTION SHOULD ALIGN WITH TOP OF SINK COUNTER.
- L22 LOCATE REMOTE DRIVER BEHIND AN ACCESS PANEL IN ADJACENT HARD LID CEILING.

KEY PLAN



LEVEL 01 - AREA A - LIGHTING PLAN

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

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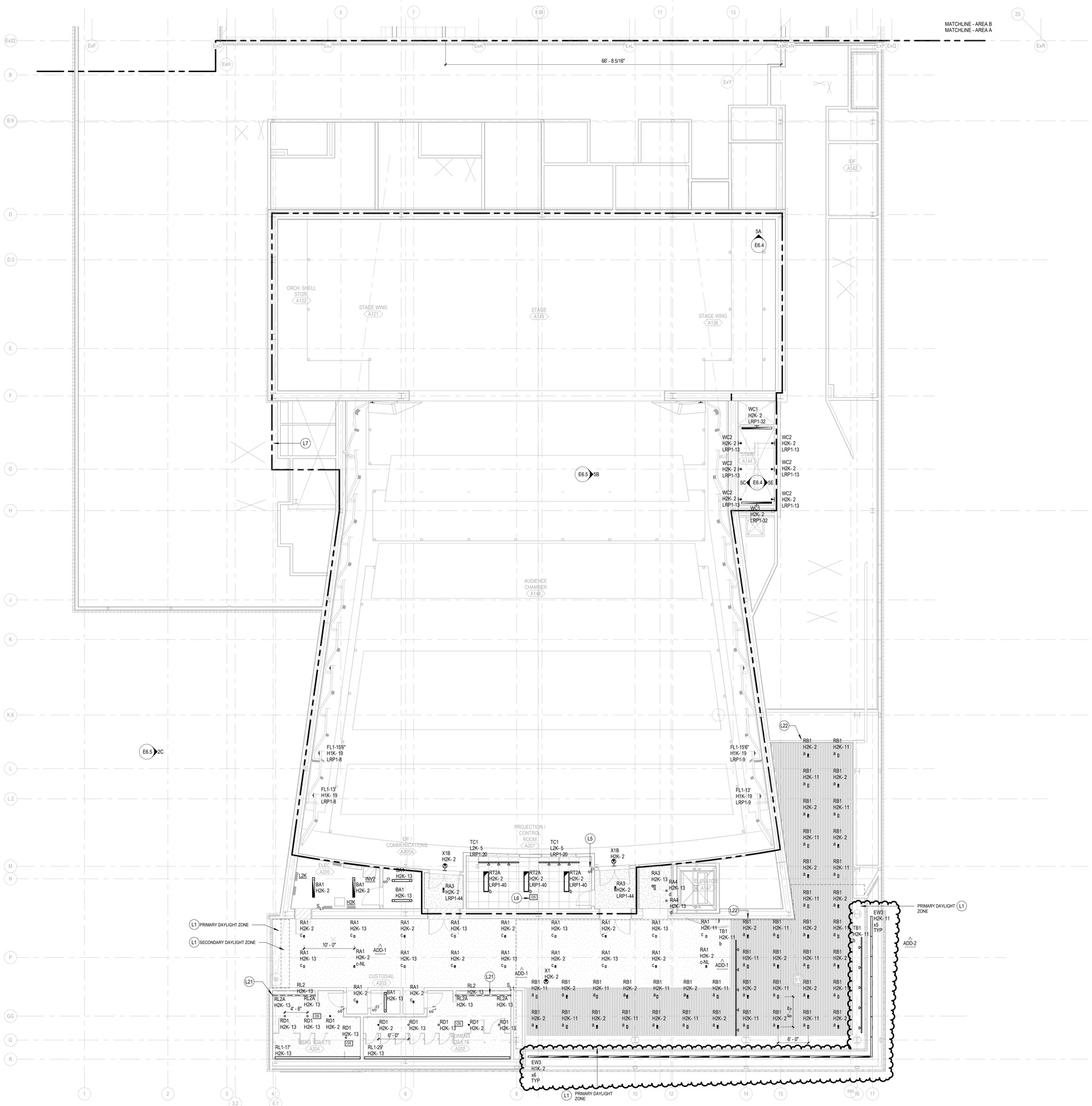
LEVEL 01 - AREA A - LIGHTING PLAN

EL1.1A



LEVEL 02 MEZZANINE - AREA A - LIGHTING PLAN

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

SHEET NOTES

L1 GENERAL LIGHTING IN DAYLIGHT ZONES IS LESS THAN 150 WATTS. DAYLIGHT RESPONSIVE CONTROLS NOT REQUIRED PER 2021 IECC C408.

L5 0-10V DIMMER WITH ELV RELAY FOR LOCAL CONTROL OF TC1 TRACK FIXTURE. PROVIDE BLACK DEVICE AND FACEPLATE.

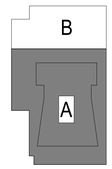
L6 PROVIDE BLACK VACANCY SENSOR COVER. COORDINATE WITH THEATRICAL LIGHTING CONTROL SYSTEM IN THIS SPACE.

L7 LIGHTING WITHIN BOUNDARY CONTROLLED BY THEATRICAL LIGHTING CONTROL SYSTEM. COORDINATE WITH QT SERIES SHEETS.

L21 TYPICAL FOR RL2 & RL2A. PROVIDE A CONTINUOUS PORTAL. BOTTOM OF VERTICAL SECTION SHOULD ALIGN WITH TOP OF SINK COUNTER.

L22 LOCATE REMOTE DRIVER BEHIND AN ACCESS PANEL IN ADJACENT HARD LID CEILING.

KEY PLAN



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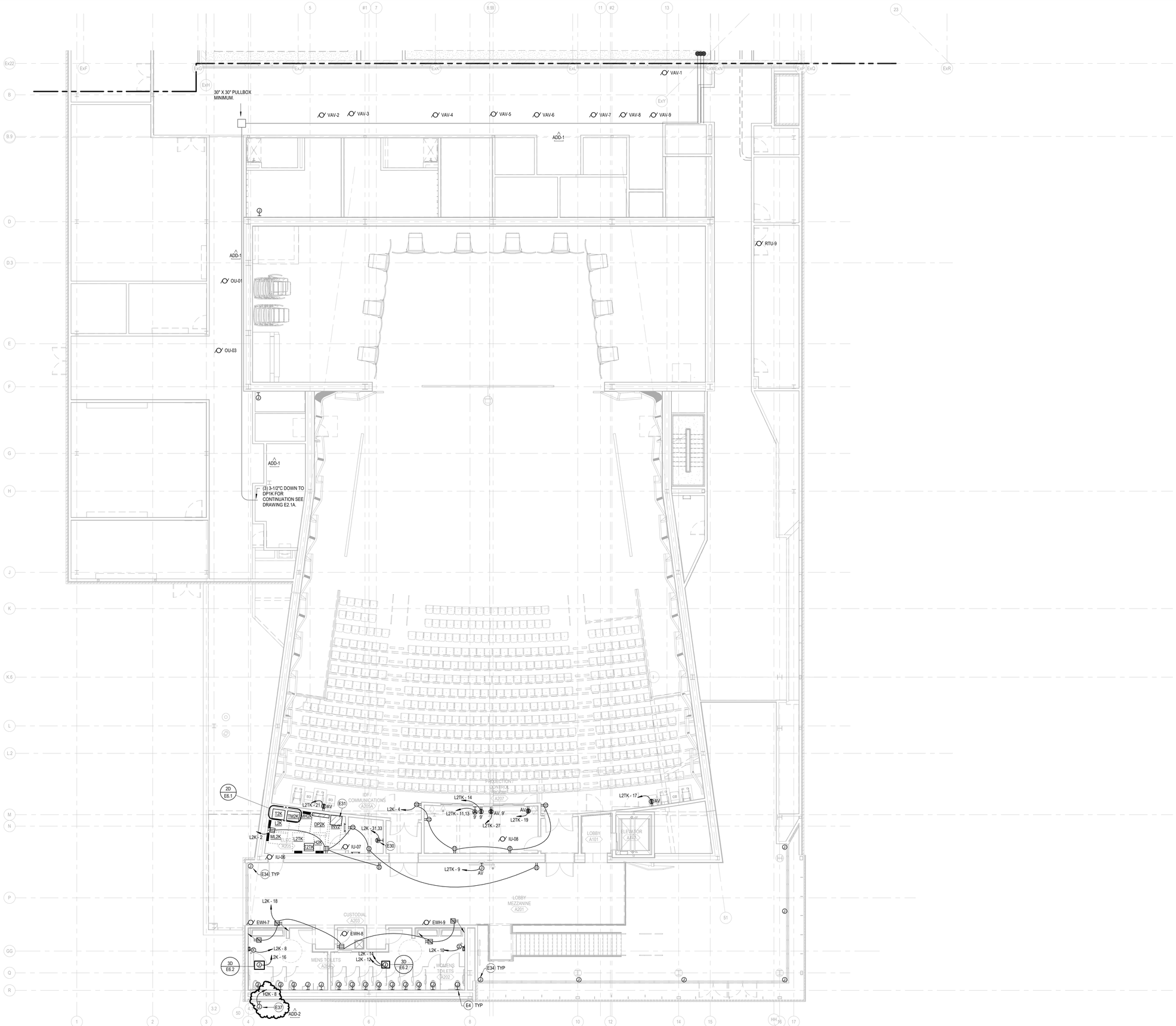
LEVEL 02 MEZZANINE - AREA A - LIGHTING PLAN

EL1.2A



GENERAL NOTES

A PROVIDE BLACK RECEPTICLES WITH BLACK NYLON FACEPLATES IN THE AUDITORIUM AND STAGE.

SHEET NOTES

E4 PROVIDE 4" SQUARE FLUSH JUNCTION BOX WITH PLASTER RING. INSTALL MECHANICAL FURNISHED SOLENOID, SENSOR AND COVER PLATE. LOW VOLTAGE WIRING DAISY CHAINED BETWEEN UNITS TO TRANSFORMER PROVIDED BY MECHANICAL CONTRACTOR.

E30 NEMA L5-30R WITH 30-2W

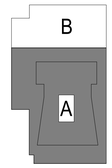
E31 FLOOR MOUNTED CENTRAL BATTERY INVERTER. HOMERUN 30-2W TO PANEL H2. SEE INVERTER SCHEDULE ON E6.2 FOR ADDITIONAL INFORMATION.

E34 (2) 1/2"C FROM OF CURTAIN WALL SYSTEM TO STRUCTURE FOR CONNECTION OF FUTURE MOTORIZED SHADING SYSTEM.

E37 CONNECTION FOR ILLUMINATED ELEMENT. COORDINATE ROUGH-IN REQUIREMENTS WITH SIGNAGE SUPPLIER. PROVIDE LIGHTING CONTROL RELAY FOR CONTROL OF ILLUMINATED SIGN. SEE LIGHTING CONTROL DRAWINGS.

ADD-2

KEY PLAN



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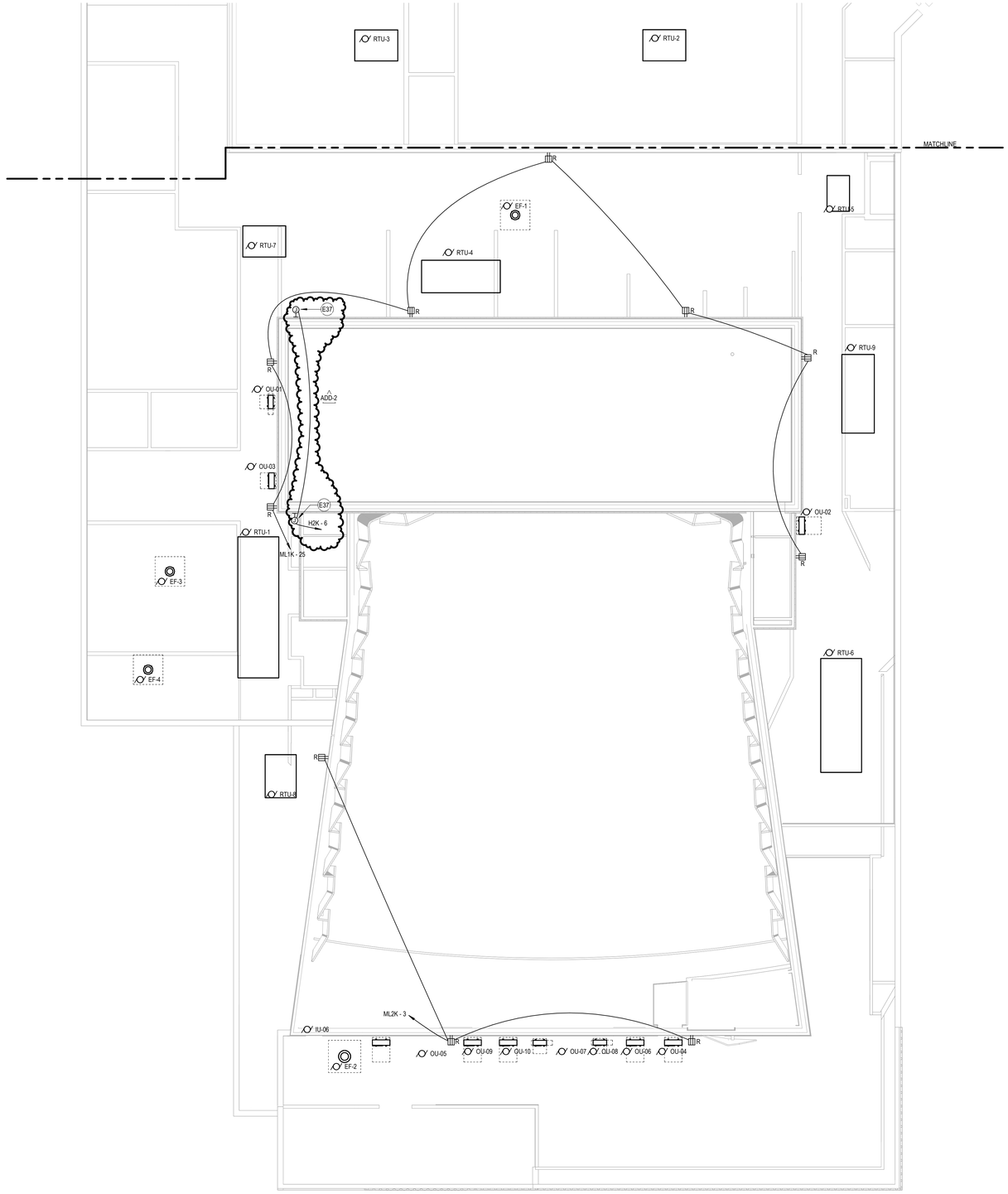
LEVEL 02 MEZZANINE - AREA A - POWER PLAN

E2.2A

N

LEVEL 02 MEZZANINE - AREA A - POWER PLAN

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



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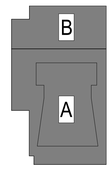
LEVEL ROOF - AREA A - POWER PLAN

SCALE: 1" = 10'-0"

SHEET NOTES

E37 CONNECTION FOR ILLUMINATED ELEMENT. COORDINATE ROUGH-IN REQUIREMENTS WITH SIGNAGE SUPPLIER. PROVIDE LIGHTING CONTROL RELAY FOR CONTROL OF ILLUMINATED SIGN. SEE LIGHTING CONTROL DRAWINGS.
ADD-2

KEY PLAN



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PREPARED BY
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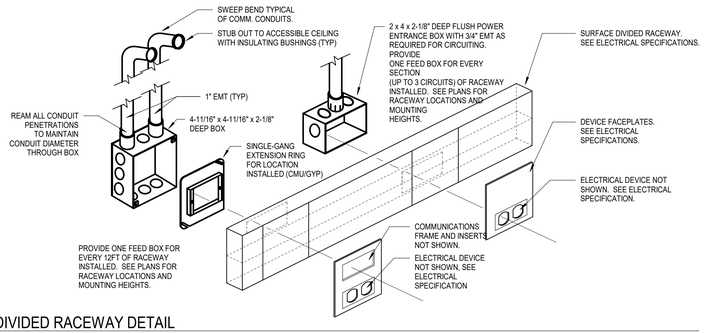
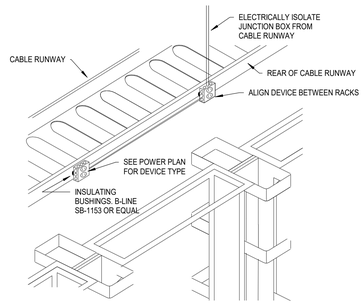
ROOF LEVEL - POWER PLAN

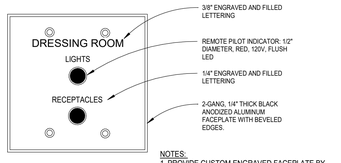
E2.5A



1A E6.2 DIVIDED RACEWAY DETAIL
NO SCALE

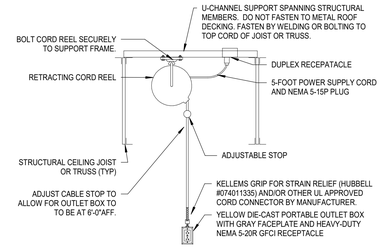


1C E6.2 CABLE RUNWAY RECEPTACLES
NO SCALE



NOTES:
1. PROVIDE CUSTOM ENGRAVED FACEPLATE BY RCI CUSTOM, PANELCRAFTERS OR APPROVED EQUAL.
2. SUBMIT CUSTOM PUNCHED PANEL LAYOUT AND COVERPLATES WITH ENGRAVING FOR APPROVAL.

1D E6.2 REMOTE PILOT FACEPLATE
NO SCALE



1E E6.2 CORD REEL - EXPOSED CEILING
NO SCALE

FLOOR BOX SCHEDULE

GENERAL NOTES:

A. BASIS OF DESIGN IS LEGRAND. PROVIDE EQUAL FROM HUBBELL.

B. PROVIDE UL LISTED DIVIDERS BETWEEN POWER AND LOW VOLTAGE DEVICES.

C. COMMUNICATIONS (COMM) OUTLETS PER DETAIL.

D. SOUND OUTLET PER NOTES AND DETAILS.

E. VIDEO OUTLET PER NOTES AND DETAILS.

F. THEATRICAL LIGHTING OUTLET PER NOTES AND DETAILS

NOTES:

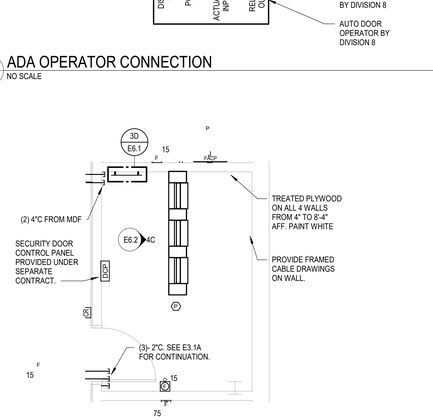
1. PROVIDE BRACKET FOR MOUNTING COMMUNICATION JACKS WITH TIA-606 IDENTIFICATION LABELS. COORDINATE BEZEL WITH COMMUNICATIONS CABLING CONTRACTOR.
2. SEE PLANS FOR RECEPTACLE TYPE.

ID	APPLICATION	FLOORING TYPE	COVER		POSITIONS / DEVICES				BASIS OF DESIGN		NOTES
			TYPE	COLOR / MATERIAL	1	2	3	4	MANUFACTURER	MODEL	
FB-1	ON GRADE	CARPET	FLANGED, CARPET INSERT	BLACK	DUPLEX 5-20R	AV	AV	THEATRICAL	WIREMOLD	EFB-8S	1

CENTRAL BATTERY INVERTER SCHEDULE

NAME	ROOM NUMBER	ROOM NAME	VOLTAGE	PHASE	OUTPUT BREAKERS	MANUFACTURER	MODEL	CIRCUIT	CONNECTED LOAD	RUN TIME	MOUNTING
INV1	A115	ELECTRICAL	277	1	(2) 20A/1P	EMERGI-LITE	277SG3750	H1K-2, H1K-4	3102	90 MIN	FLOOR MOUNT
INV2	A205	ELECTRICAL	277	1	(2) 20A/1P	EMERGI-LITE	277SG3750	H2K-2, H2K-4	3194	90 MIN	FLOOR MOUNT

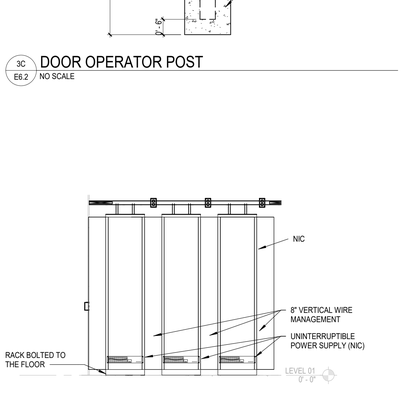
ADD-2



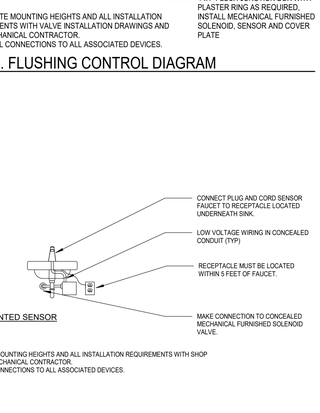
NOTES:

A. WHEN DOOR IS LOCKED BY KEY, NIGHT DISABLE TOGGLE SWITCH IS TURNED OFF TO PREVENT ACCESS USING THE EXTERIOR ADA PUSHPAD. INTERIOR ADA PUSHPAD IS ALWAYS ACTIVE.
B. MANUAL OPERATION - WHEN DOOR IS CLOSED BUT UNLOCKED, LEVER RETRACTS LATCHBOLT. WHEN DOOR IS LOCKED, LEVER DOES NOT RETRACT LATCHBOLT.
C. ADA OPERATION - WHEN DOOR IS CLOSED BUT UNLOCKED, PRESSING EITHER PUSHPAD ACTIVATES ELECTRIC STRIKE AND AFTER DELAY ACTIVATES ADA OPERATOR TO OPEN DOOR. WHEN DOOR IS LOCKED, PRESSING EXTERIOR PUSHPAD DOES NOT OPEN DOOR. AFTER VALID CARD READ IS RECEIVED, SECURITY SYSTEM ENABLES RELAY TO ENABLE PUSHPAD TO ACTIVATE OPERATOR WHICH ACTIVATES ELECTRIC STRIKE AND AFTER DELAY ACTIVATES ADA OPERATOR TO OPEN DOOR.
D. CONNECT REMOTE OFF/AUTO/HOLD KEYSWITCH IF SPECIFIED.
E. INTERIOR DOORS WITHOUT SECURITY SHOULD HAVE THE NIGHT DISABLE SWITCH WIRED DIRECTLY TO THE ACTUATOR INPUT OF THE ADA OPERATOR WITHOUT A DOOR CONTROL RELAY.

3A E6.2 ADA OPERATOR CONNECTION
NO SCALE

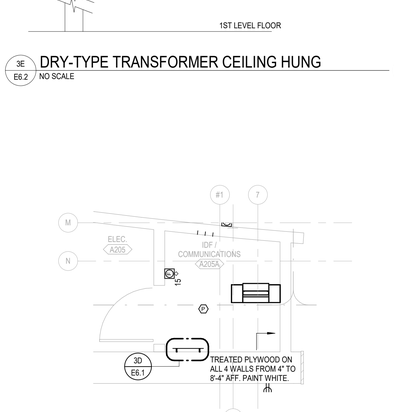


3C E6.2 DOOR OPERATOR POST
NO SCALE

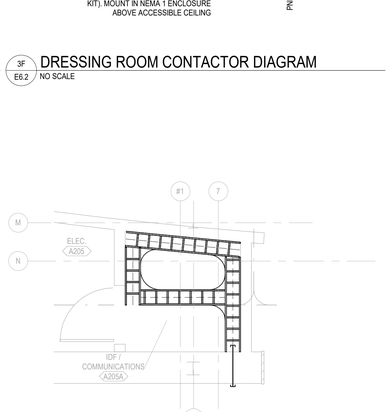


NOTES:
1. COORDINATE MOUNTING HEIGHTS AND ALL INSTALLATION REQUIREMENTS WITH VALVE INSTALLATION DRAWINGS AND WITH MECHANICAL CONTRACTOR.
2. MAKE FINAL CONNECTIONS TO ALL ASSOCIATED DEVICES.

3D E6.2 AUTO. FLUSHING CONTROL DIAGRAM
NO SCALE



3E E6.2 DRY-TYPE TRANSFORMER CEILING HUNG
NO SCALE



3F E6.2 DRESSING ROOM CONTACTOR DIAGRAM
NO SCALE

4A E6.2 ENLARGED EQUIPMENT PLAN IDF A158
SCALE: 1/4" = 1'-0"

4B E6.2 ENLARGED CABLE RUNWAY PLAN IDF A158
SCALE: 1/4" = 1'-0"

4C E6.2 IDF A158 RACK ELEVATION
SCALE: 3/8" = 1'-0"

NOTES:
1. COORDINATE MOUNTING HEIGHTS AND ALL INSTALLATION REQUIREMENTS WITH SHOP DRAWINGS AND MECHANICAL CONTRACTOR.
1. MAKE FINAL CONNECTIONS TO ALL ASSOCIATED DEVICES.

4D E6.2 AUTO. LAV/WASH FOUNTAIN DIAGRAM
NO SCALE

4E E6.2 ENLARGED EQUIPMENT PLAN IDF A205A
1/4" = 1'-0"

4F E6.2 ENLARGED CABLE RUNWAY PLAN IDF A205A
1/4" = 1'-0"

ADD-1

5A E6.2 MAKEUP ELEVATION WEST
SCALE: 1/4" = 1'-0"

5B E6.2 MAKEUP ELEVATION SOUTH
SCALE: 1/4" = 1'-0"

5C E6.2 MAKEUP ELEVATION EAST
SCALE: 1/4" = 1'-0"

DLR GROUP
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STATE OF TEXAS
MARK JOSEPH NECHWADOWICZ
146025
LICENSED
PROFESSIONAL ENGINEER
TBPE FIRM REGISTRATION NUMBER F-1101

CRANDALL ISD HIGH SCHOOL
PAC ADDITION
13385 Fm 3039, Crandall, TX 75114

ISSUE FOR BID AND PERMIT
2024.07.25
REVISIONS
ADD-1 8/19/24
ADD-2 9/03/24

39-23712-00

ELECTRICAL DETAILS

E6.2

INTERIOR LUMINAIRE SCHEDULE

GENERAL NOTES:
1. FURNISH ALL LIGHTING FIXTURES COMPLETE WITH MOUNTING ACCESSORIES TO MEET JOB REQUIREMENTS. VERIFY FIXTURE MOUNTING, LOCATION, AND FIXED OPTICAL ORIENTATION AGAINST ARCHITECT'S PLANS, ELEVATIONS, AND DETAIL DRAWINGS. EXACT LOCATION OF ALL FIXTURES SHALL BE CONFIRMED WITH THE ARCHITECT PRIOR TO ROUGHING IN.
2. FIXTURES SHOWN IN CONTINUOUS RUNS TO SATISFY NOMINAL LENGTHS AS SHOWN ON DRAWINGS. FIXTURE TAGS SHOWN ONCE ON A CONTINUOUS ROW OF FIXTURES SHALL BE TYPICAL FOR THAT ROW UNLESS OTHERWISE NOTED.
3. ALL FIXTURES WILL BE SUPPORTED FROM THE BUILDING STRUCTURE, INDEPENDENT OF HUNG CEILING WITH ROD OR JACK CHAIN SUPPORT. AIRCRAFT CABLE LENGTHS, STEM LENGTHS, AND STEM LOCATIONS OF ALL PENDANT FIXTURES TO BE VERIFIED AND CONFIRMED BY OWNER, ARCHITECT, AND CONSULTANT PRIOR TO ORDERING STEMS. AIRCRAFT CABLE HUNG FIXTURES TO BE PROVIDED WITH 18" OF EXTRA LENGTH WITH EXCESS TO BE LOCATED ABOVE THE CEILING ALONG WITH 18" OF EXTRA POWER CORD LENGTH.
4. LED FIXTURES WILL USE INTEGRAL DRIVERS UNLESS OTHERWISE NOTED. DIMMABLE DRIVERS SHALL BE COMPATIBLE WITH LAMPS AND DIMMERS/CONTROL SYSTEM.
5. ALL LIGHT FIXTURES ARE TO BE PROVIDED BY SPECIFIED MANUFACTURER OR APPROVED EQUAL. "ALTERNATE MANUFACTURER" AND "OR APPROVED" MEAN EQUIVALENT OR SUPERIOR IN PERFORMANCE, MATERIALS, WORKMANSHIP, AND APPEARANCE TO THE SPECIFIED EQUIPMENT.
6. CONTRACTOR TO PROVIDE AND INSTALL ALL TRANSFORMERS, DRIVERS, BATTERY PACKS, AND/OR BALLASTS REQUIRED TO OPERATE LAMPS SPECIFIED, INCLUDING REMOTE POWER SUPPLIES AND THE ENCLOSURES FOR SAME. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR VERIFICATION OF COMPATIBILITY BETWEEN SPECIFIED LAMPS, SPECIFIED POWER SUPPLIES, DIMMING, AND OTHER CONTROL DEVICES SPECIFIED. NOTIFY ARCHITECT AND CONSULTANT OF AN INCOMPATIBILITY PRIOR TO ORDERING EQUIPMENT.
7.CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE COORDINATION OF ALL LIGHTING EQUIPMENT AND CONTROL DEVICES WITH CEILING, WALL, AND GROUND TYPES SPECIFIED PRIOR TO ORDERING LIGHTING EQUIPMENT. NOTIFY ARCHITECT AND CONSULTANT OF ANY INCOMPATIBILITY PRIOR TO ORDERING EQUIPMENT.
8. ALL LED LUMINAIRES TO HAVE A LIFE RATING OF 50,000 HOURS OR HIGHER AT L70 OR BETTER AND A FIVE-YEAR WARRANTY.
9. PRELIMINARY AIMING OF ALL ADJUSTABLE LIGHTING EQUIPMENT WILL BE DONE DURING INSTALLATION BY THE ELECTRICAL CONTRACTOR AS INDICATED ON THE LIGHTING PLANS / AIMING DIAGRAM, WHERE SUCH A DIAGRAM IS INCLUDED IN CONTRACT.
10. SCHEDULED LUMEN OUTPUT REPRESENTS DELIVERED LUMENS.
11. NO PENDANTS ABOVE FURNITURE TO BE MOUNTED BELOW 7'-0" AFF UNLESS OTHERWISE SPECIFIED.
12. LUMINAIRE CATALOG/MODEL NUMBERS ARE PROVIDED FOR CONVENIENCE ONLY AND ARE SUBJECT TO CHANGE. CONTRACTOR TO GENERATE EXACT CATALOG NUMBERS AT TIME OR ORDER. DEFER TO PERFORMANCE SPECIFICATIONS LISTED IN THIS SCHEDULE IN EVENT OF CONFLICT OR CHANGE.

TYPE	CONSTRUCTION				LIGHT SOURCE				ELECTRICAL				PRODUCT		
	DESCRIPTION	MOUNTING	FINISH	LUMENS PER FOOT	LUMENS DOWN	LUMENS UP	CCT	CRI	DRIVER	VOLT	WATTS (W)	WATTS PER FOOT (W / LF)	MFR	MODEL	EQUIVALENT MFR
BA1	4-FT STRIP LIGHT WITH ROUND LENS	PENDANT	WHITE		5000 lm	0 lm	3500K	80	0-10V DIMMING	277 V	41 W		LITHONIA	ZL1D-L48-SMR-5000LM-FST-MVO LT-35K	METALUX
BA2	4-FT STRIP LIGHT WITH ROUND LENS	PENDANT	BLACK		5000 lm	0 lm	3500K	80	0-10V DIMMING	277 V	41 W		LITHONIA	ZL1D-L48-SMR-5000LM-FST-MVO LT-35K	METALUX
BB1	2X4 HIGH BAY FIXTURE	PENDANT	WHITE		24000 lm	0 lm	3500K	80	0-10V DIMMING	277 V	265 W		LITHONIA	XIB-L48-24000-AVCL-MVOLT-GZ1 0-35K	
BC1	4-FT SEALED STRIP LIGHT	PENDANT	WHITE		6000 lm	0 lm	3500K	80	0-10V DIMMING	277 V	49 W		LITHONIA	CSVT-L48-6000LM-MVOLT-35K-80CRI	METALUX
BD1	6-FT LINEAR PENDANT WITH 3-SIDED LENS - RGBW	PENDANT	BLACK		7200 lm	0 lm	RGBW	80	DMX	277 V	60 W		LUMENWERX	QUAD WIDE	
FL1-1.13'	1-INCH NOMINAL TAPE LIGHT IN EXTRUSION WITH GRAZE OPTIC LENS	SURFACE	WHITE	294 lm	3822 lm	0 lm	3000K	90	DMX	277 V	39 W	3 W	QTRAN	VERS-GRAZEIER SERIES	
FL1-15'6"	1-INCH NOMINAL TAPE LIGHT IN EXTRUSION WITH GRAZE OPTIC LENS	SURFACE	WHITE	294 lm	4557 lm	0 lm	3000K	90	DMX	277 V	45 W	3 W	QTRAN	VERS-GRAZEIER SERIES	
FL1-24' 0"	1-INCH NOMINAL TAPE LIGHT IN EXTRUSION WITH GRAZE OPTIC LENS	SURFACE	WHITE	294 lm	7056 lm	0 lm	3000K	90	DMX	277 V	72 W	3 W	QTRAN	VERS-GRAZEIER SERIES	
FL1-25'6"	1-INCH NOMINAL TAPE LIGHT IN EXTRUSION WITH GRAZE OPTIC LENS	SURFACE	WHITE	294 lm	7497 lm	0 lm	3000K	90	DMX	277 V	77 W	3 W	QTRAN	VERS-GRAZEIER SERIES	
LA1	CASEWORK MOUNTED LINEAR WITH 85-DEGREE ASYMMETRIC OPTIC	SURFACE	BLACK	209 lm	0 lm	0 lm	3000K	90	0-10V DIMMING	277 V		4 W	VODE	ZIPTWO MICRO 3508 SERIES	
PD1	9X16 INCH CYLINDER WITH MEDIUM FLOOD OPTICS AND REMOTE DRIVER	PENDANT	BLACK		2500 lm	0 lm	3000K	80	REMOTE DMX	277 V	35 W		KIRLIN	SSR-09620-2500-30K-MFL-38-AS B	
PD2	9X16 INCH CYLINDER WITH WIDE FLOOD OPTICS AND REMOTE DRIVER	PENDANT	BLACK		5000 lm	0 lm	3000K	80	REMOTE DMX	277 V	55 W		KIRLIN	SSR-09620-5000-30K-WFL-38-AS B	
PD3	9X16 INCH CYLINDER WITH WIDE FLOOD OPTICS AND REMOTE DRIVER	PENDANT	BLACK		2500 lm	0 lm	3000K	80	REMOTE DMX	277 V	35 W		KIRLIN	SSR-09620-2500-30K-WFL-38-AS B	
RA1	MULTI-CELL RECESSED DOWNLIGHT - WHITE GYP CEILING	RECESSED	WHITE		1475 lm	0 lm	3500K	80	0-10V DIMMING, 1%	277 V	13 W		USAI	MDF-04-13H1-35KS-50-WH-WH-N C-UNV-D6E	
RA3	MULTI-CELL RECESSED DOWNLIGHT - DARK GYP CEILING	RECESSED	BLACK		4675 lm	0 lm	3500K	80	0-10V DIMMING, 1%	277 V	41 W		USAI	MDF-12-41H1-35KS-50-BL-BL-NC-UNV	
RA4	MULTI-CELL RECESSED DOWNLIGHT - DARK GYP CEILING	RECESSED	BLACK		750 lm	0 lm	3500K	80	REMOTE 0-10V DIMMING, 1%	277 V	8 W		USAI	MDF-02-08-35KS-50-BL-BL-RM	
RB1	MULTI-CELL RECESSED DOWNLIGHT - WOOD CEILING	RECESSED	BLACK		2900 lm	0 lm	3500K	80	REMOTE 0-10V DIMMING, 1%	277 V	27 W		USAI	MDG-08-27H1-35KS-35-BL-BL-RM	
RD1	4-INCH NOMINAL RECESSED DOWNLIGHT - MEDIUM WIDE OPTIC	RECESSED	SEMI-SPECULAR		750 lm	0 lm	3500K	80	0-10V DIMMING	277 V	8 W		GOTHAM	EVO 4 SERIES	
RD2	4-INCH NOMINAL RECESSED DOWNLIGHT - MEDIUM WIDE OPTIC	RECESSED	SEMI-SPECULAR		1000 lm	0 lm	3500K	80	0-10V DIMMING	277 V	9 W		GOTHAM	EVO 4 SERIES	
RL1-17'	2-INCH NOMINAL RECESSED LINEAR WITH LAMBERTIAN OPTICS	RECESSED	WHITE		350 lm	0 lm	3500K	80	0-10V DIMMING	277 V	54 W		LUMENWERX	VIA2R D HLO FH SW 90CRI 500LM 35K	
RL1-29'	2-INCH NOMINAL RECESSED LINEAR WITH LAMBERTIAN OPTICS	RECESSED	WHITE		350 lm	0 lm	3500K	80	0-10V DIMMING	277 V	93 W		LUMENWERX	VIA2R D HLO FH SW 90CRI 500LMF 35K	
RL2	1-INCH NOMINAL RECESSED MUD-IN LINEAR CAPABLE OF 90-DEGREE CORNERS ONTO WALL; LUMENS IS PER FOOT	RECESSED	N/A	0 lm	369 lm	0 lm	3500K	90	0-10V DIMMING	277 V		4 W	PUREEDGE	TL1A SWDC-X-ST35K	
RL2A	SAME AS RL2, EXCEPT VERTICAL PORTION	RECESSED	N/A	0 lm	369 lm	0 lm	3500K	90	0-10V DIMMING	277 V		3 W	PUREEDGE	TL1A SWDC-X-ST35K	
RL3	1-INCH NOMINAL RECESSED LINEAR CAPABLE OF 90-DEGREE CORNERS; LUMENS IS PER FOOT PROVIDE FLANGE TRIM	RECESSED	CUTSOM WOOD FINISH	0 lm	216 lm	0 lm	3500K	90	0-10V DIMMING	277 V		4 W	CORONET	RUSH RECESSED SERIES	
RL3A	1-INCH NOMINAL TAPE LIGHT IN EXTRUSION, VERTICAL POSITION, PROVIDE FLANGE TRIM	RECESSED	CUTSOM WOOD FINISH	0 lm	216 lm	0 lm	3500K	90	0-10V DIMMING	277 V	0 W	4 W	CORONET	RUSH RECESSED SERIES	
RL5	4-FOOT RECESSED LINEAR	RECESSED	WHITE		4000 lm	0 lm	3500K	90	0-10V DIMMING	277 V	36 W		LUMENWERX	VIA 5 RECESSED SERIES	
RT1A	2-FOOT BY 2-FOOT RECESSED TROFFER - ACT CEILING	RECESSED	N/A	0 lm	4050 lm	0 lm	3500K	80	0-10V DIMMING	277 V	38 W	0 W	FLUXWERX	TRANSOM SERIES	
RT1B	2-FOOT BY 2-FOOT RECESSED TROFFER - ACT CEILING	RECESSED	N/A	0 lm	2650 lm	0 lm	3500K	80	0-10V DIMMING	277 V	23 W	0 W	FLUXWERX	TRANSOM SERIES	
RT2A	1-FOOT BY 4-FOOT RECESSED TROFFER - ACT CEILING	RECESSED	NA	0 lm	4700 lm	0 lm	3500K	80	0-10V DIMMING	277 V	47 W	0 W	FLUXWERX	TRANSOM SERIES	
RT2C	1-FOOT BY 4-FOOT RECESSED TROFFER - ACT CEILING	RECESSED	NA	0 lm	4050 lm	0 lm	3500K	80	0-10V DIMMING	277 V	38 W	0 W	FLUXWERX	TRANSOM SERIES	
TA1	TRACK HEAD & SURFACE MOUNTED TRACK SYSTEM - PROVIDE A HEXCELL LOUVER , LINEAR SPREAD LENS, 22-DEGREEE, 31-DEGREE, 40-DEGREE LENS FOR EACH SPOT LIGHT	SURFACE	WHITE		847 lm	0 lm	3500K	90	ELV DIMMING	120 V	<varies>		AMERLUX	SPEQ-S / GES SERIES	
TB1	MINI-TRACK HEAD WITH 28-DEGREE OPTICS & PENDANT MOUNTED TRACK SYSTEM	PENDANT	BLACK		1120 lm	0 lm	3500K	90	0-10V DIMMING	277 V	12 W		JOKER LIGHT	FIT 48V SERIES	
TC1	TRACK HEAD & SURFACE MOUNTED TRACK SYSTEM - BLACK FINISH- PROVIDE A HEXCELL LOUVER , LINEAR SPREAD LENS, 22-DEGREEE, 31-DEGREE, 40-DEGREE LENS FOR EACH SPOT LIGHT	SURFACE	BLACK		847 lm	0 lm	3500K	90	ELV DIMMING	120 V	9 W		AMERLUX	SPEQ-S / GES SERIES	
TS1	6-INCH STEP LIGHT	WALL	SEMI GLOSS BLACK	0 lm	194 lm	0 lm	3000K	0	0-10V DIMMING	277 V	5 W	0 W	HYDREL	HSL13 SERIES	
TS2	BLUE NODE STEP LIGHT	WALL	BLACK	0 lm	2 lm	0 lm	BLUE	0	DMX	120 V	3 W	0 W	ETC	BLUE DOME SERIES	
TS3	6-INCH STEP LIGHT - BLUE	WALL	SEMI GLOSS BLACK	0 lm	194 lm	0 lm	BLUE	0	0-10V DIMMING	277 V	5 W	0 W	HYDREL	HSL13 SERIES - BLUE	
WA1	MAKEUP VANITY LIGHT WITH LED FROSTED LAMPS EVERY 9-INCHES AND SQUARE GUARDS ON EACH LAMP	WALL	WHITE	0 lm	350 lm	0 lm	2700K	0	FORWARD PHASE DIMMING	120 V		4 W	CALIFORNIA ACCENT LIGHTING	ALS300P-SG-9"-27K-GSFW-DM-DRY	
WB1	WALL MOUNTED SEALED FIXTURE	WALL	N/A		5000 lm	0 lm	3500K	80	0-10V DIMMING	277 V	<varies>		LITHONIA	CSVT	
WC1	6-FOOT WALL MOUNTED LINEAR FIXTURE - RGBW	WALL	BLACK	0 lm	7200 lm	0 lm	RGBW	80	DMX	277 V	60 W	0 W	LUMENWERX	QUAWW-HLO-LED-QUADRO-10 WF-6'-277-DMX-1-DRM	
WC2	3-FOOT WALL MOUNTED LINEAR FIXTURE - RGBW - VERTICAL MOUNT	WALL	BLACK	0 lm	7200 lm	0 lm	RGBW	80	DMX	277 V	60 W	0 W	LUMENWERX	QUAWW-HLO-LED-QUADRO-10 WF-3'-277-DMX-1-DRM	
WD1	4-FOOT HORIZONTAL WALL MOUNTED LINEAR FIXTURE	WALL	BLACK	0 lm	5000 lm	0 lm	3500K	80	0-10V DIMMING	277 V	40 W	0 W	LITHONIA	ZL1D-L48-SMR-5000LM-FST-MVO LT-35K	
WD2	4-FOOT VERTICAL WALL MOUNTED LINEAR FIXTURE	WALL	BLACK	0 lm	5000 lm	0 lm	3500K	80	0-10V DIMMING	277 V	40 W	0 W	LITHONIA	ZL1D-L48-SMR-5000LM-FST-MVO LT-35K	
WL1	2-FOOT WALL-MOUNTED VANITY	WALL	BLACK	0 lm	1258 lm	0 lm	3500K	90	0-10V DIMMING	277 V	14 W	0 W	OXYGEN	ADELPHI SERIES	
X1	EDGE LIT EXIT SIGN - UNIVERSAL MOUNTING - PROVIDE ARROWS AS SHOWN - BRUSHED ALUMINUM	UNIVERSAL	BRUSHED ALUMINUM		0 lm	0 lm	GREEN	0		277 V	2 W		SURE -LITES	EUX SERIES AC ONLY	
X1B	EDGE LIT EXIT SIGN - UNIVERSAL MOUNTING - PROVIDE ARROWS AS SHOWN - BLACK FINISH	UNIVERSAL	BLACK		0 lm	0 lm	GREEN	0		277 V	2 W		SURE -LITES	EUX SERIES AC ONLY	
X1M	EDGE LIT EXIT SIGN - MULLION MOUNT	MULLION	BLACK		0 lm	0 lm	GREEN	0		277 V	2 W		SURE -LITES	EUX SERIES AC ONLY	
X2	DOUBLE SIDED EDGE LIT EXIT SIGN - UNIVERSAL MOUNTING - PROVIDE ARROWS AS SHOWN - BRUSHED ALUMINUM	UNIVERSAL	BRUSHED ALUMINUM		0 lm	0 lm	GREEN	0		277 V	2 W		SURE -LITES	EUX SERIES AC ONLY	

EXTERIOR LUMINAIRE SCHEDULE

TYPE	CONSTRUCTION			LIGHT SOURCE				ELECTRICAL			PRODUCT		NOTE
	DESCRIPTION	MOUNTING	FINISH	LUMENS DOWN	LUMENS UP	CCT	CRI	DRIVER	VOLT	WATTS (W)	MFR	MODEL	
E2	16-FOOT PEDESTRIAN POLE WITH TYPE V OPTICS. PROVIDE ROUND STRAIGHT ALUMINUM POLE	POLE	BLACK	6843 lm	0 lm	3500K	80	0-10V DIMMING	277 V	61 W	SELUX	MISTELLA SERIES	7-PIN TWIST LOCK RECEPTACLE. VANDAL RESISTANT POLE BASE COVER
E3	35-FOOT POLE WITH TWO HEADS AT 180-DEGREE ORIENTATION - TYPE 2M OPTICS. PROVIDE ROUND STRAIGHT ALUMINUM POLE	POLE	BLACK	16723 lm	0 lm	3500K	80	0-10V DIMMING	277 V	138 W	LITHONIA	DSX1 LED SERIES	LUMENS AND WATTS PER HEAD. WIRELESS NLIGHT AIR
EG1	4-FT INGRADE WALL GRAZER WITH 10X30 OPTICS AND 2.5 TILT	INGRADE	BLACK	1400 lm	0 lm	3500K	80	0-10V DIMMING	277 V	20 W	LUMENPULSE	INGROUND LOI SERIES	
EL1	4-FOOT RECESSED LINEAR - WET RATED	RECESSED	BLACK	1000 lm	0 lm	3500K	80	0-10V DIMMING	277 V	11 W	LUMENWERX	VIA WET RECESSED SERIES	
ES1 ADD-1	SPOT LIGHT WITH STANCHION AND KNUCKLE MOUNTED ON BASE - 40-DEGREE OPTIC, HALF SNOOT, HONEYCOMB LOUVER, FULL SET OF BEAM ANGLE LENS DEGREE, BLUE COLOR FILTER	STANCHION AND KNUCKLE	BLACK	761 lm	0 lm	3500K	80	0-10V DIMMING	277 V	8 W	ECOSENSE	RISE SERIES	
EW1	SCONCE WITH TYPE IV OPTICS	SURFACE WALL	BLACK	2422 lm	0 lm	3500K	80	0-10V DIMMING	277 V	20 W	LIGMAN	ULEE-30021 SERIES	
EW2	DIRECT/INDIRECT SCONCE - 30-DEGREE UP OPTIC AND TYPE III DOWN OPTIC	SURFACE WALL	BLACK	982 lm	982 lm	3500K	80	0-10V DIMMING	277 V	20 W	LIGMAN	UGI-31651 SERIES	
EW3	4-FT SURFACE MOUNTED LINEAR WITH ASYMMETRIC OPTICS	SURFACE	BLACK	708 lm	0 lm	3500K	80	0-10V DIMMING	277 V	8 W	LUMENPULSE	LUMENFACADE SERIES	ADJUSTABLE MOUNTING BRACKET WITH 90 DEG ROTATION
EW4	RECESSED STEP LIGHT WITH EXTENDED THROW OPTICS	RECESSED WALL	BLACK	301 lm	0 lm	3500K	80	0-10V DIMMING	277 V	7 W	BEGA	B24063	PROVIDE SPECIAL BACKBOX FOR RECESSED MOUNTING

ENERGY CODE: IECC 2021

LIGHTING SEQUENCE OF OPERATIONS

SPACE TYPE	OCCUPANCY (AUTO ON)	VACANCY (MANUAL ON)	TIME OUT PERIOD (MIN)	TIMECLOCK CONTROL	DIMMING	MANUAL ON/OFF	DAYLIGHT CONTROL	PHOTOCELL ILLUMINANCE (FC)	RECEPTACLE CONTROL	THEATRICAL CONTROL	SCHEDULE NOTES
LOBBY/MEZZANINE		X	20	X			X	20 FC @36"		X	1
ELEVATOR LOBBY & SURROUNDING CORRIDORS		X	20	X							1
GROUP RESTROOM	X		20								
SINGLE RESTROOM	X		10								
CONCESSIONS		X	20								
OFFICES		X	20						X		5
STAIRS	X		20		X						
DRESSING ROOMS		X	20								
BAND/PRACTICE ROOMS		X									5
WORKSHOP		X									2
THEATER-AUDIENCE					X					X	3
THEATER-STAGE					X					X	3
SOUND AND LIGHT LOCK					X					X	3
PROJECTION CONTROL ROOM					X					X	3
CONCESSIONS/BOX OFFICE	X				X						
STORAGE/JANITOR		X	20								
IDF		X	20								
LOADING DOCK		X	20								
ELECTRICAL/MECHANICAL		X	20			X					2
EXTERIOR SITE POLE LIGHTING				X	X		X				
EXTERIOR CANOPIES/FAÇADE				X	X		X				
EXTERIOR SCONCES				X	X		X				
LANDSCAPE LIGHTING				X	X		X				
WORKROOMS		X	20								5

GENERAL NOTES:
A. LIGHTING CONTROLS INDICATED ARE FOR REFERENCE ONLY AND MUST BE COORDINATED WITH CONTROLS SHOP DRAWINGS FOR EXACT QUANTITIES OF SENSORS, DEVICES, AND ALL NECESSARY CONNECTIVITY EQUIPMENT.
B. PROVIDE UL924 RELAYS FOR EMERGENCY LIGHTING TO ALLOW FULL CONTROLS UNDER NORMAL CONDITIONS. EMERGENCY LUMINAIRES SHALL TURN FULL "ON" UPON LOSS OF NORMAL POWER.
C. PROVIDE THE NUMBER OF ZONES AS INDICATED ON PLANS.
D. PROVIDE 0-10V DIMMING ON ALL 277V DIMMING ZONES AND FORWARD-PHASE DIMMING ON ALL 120V DIMMING ZONES.
E. COMPLETE COMMISSIONING OF CONTROL SYSTEM AND PROVIDE REPORT TO ENGINEER OF REVIEW
F. VERIFY ALL ON/OFF, OCCUPIED/UNOCCUPIED TIMES WITH OWNER PRIOR TO PROGRAMMING.

SCHEDULE NOTES:
1. LIGHT FIXTURES DESIGNATED AS NIGHT LIGHT (NL-#) SHALL BE CONNECTED TO THE NETWORK LIGHTING CONTROL SYSTEM INDEPENDENT OF REGULARLY CONTROLLED FIXTURES AND SHALL OPERATE AS FOLLOWS:
   A. FIXTURES SHALL TURN TO FULL-ON WHEN OCCUPIED AND/OR "ON" MODE
   B. FIXTURES SHALL TURN OFF WHEN IN UNOCCUPIED MODE
2. MANUAL ON SWITCH TO TURN ON LIGHTS AFTER HOURS ONLY PERMITS LIGHTS TO BE ON FOR 2 HOURS
3. THEATRICAL LIGHTING IS CONTROLLED BY DMX SYSTEM AND ITS DATA CONTROL PROTOCOL. ARCHITECTURAL DMX FIXTURES SHALL BE ADDRESSED SEPARATELY.
4. AUTOMATIC RECEPTACLE CONTROL VIA OCCUPANCY SENSOR
5. AUTOMATIC RECEPTACLE CONTROL VIA TIMECLOCK

SEQUENCE OF OPERATIONS GENERAL NOTES:
A. SEQUENCE OF OPERATIONS SHALL CONFORM TO LIGHTING CONTROL REQUIREMENTS PER IECC 2021
B. BUILDING TIME SCHEDULE - VERIFY WITH OWNER PRIOR TO PROGRAMMING:
   a. SCHOOL HOURS: 7 AM - 5 PM
   b. AFTER HOURS: 5 PM - 7 AM

IECC COMMISSIONING NOTES:
A. PROJECT SHALL BE COMMISSIONED IN ACCORDANCE WITH SECTION C408 OF IECC 2021. IN ADDITION TO OTHER PROJECT REQUIREMENTS, THE FOLLOWING DOCUMENTATION SHALL BE PROVIDED TO THE BUILDING OWNER WITHIN 90 DAYS OF THE DATE OF RECEIPT OF THE CERTIFICATE OF OCCUPANCY.
- OPERATING AND MAINTENANCE MANUAL WITH COMPONENTS INDICATED IN C408.2.5.2
- AS-BUILT DRAWINGS FOR ELECTRICAL POWER SYSTEMS.
- DOCUMENTATION CERTIFYING LIGHTING SYSTEM FUNCTIONAL TESTING INCLUDING:
  1. OCCUPANT SENSOR CONTROLS
  2. TIME-SWITCH CONTROLS
  3. DAYLIGHT RESPONSIVE CONTROLS

ADD-1

CRANDALL PENDANT MOUNTING SCHEDULE

ROOM	TYPE	MOUNTING HEIGHT BOTTOM OF LUMINAIRE	NOTES
LEVEL 1			
F.O.H. STORAGE A102	BA1	9'-6"	MOUNT BELOW MECHANICAL EQUIPMENT
CONCESSION STORAGE A104	BA1	9'-6"	MOUNT BELOW MECHANICAL EQUIPMENT
F.O.H. STORAGE A107	BA1	9'-6"	MOUNT BELOW MECHANICAL EQUIPMENT
CUSTODIAL A109	BA1	8'-0"	MOUNT BELOW MECHANICAL EQUIPMENT
LOADING DOCK A114	BC1	14'-6"	MOUNT BELOW MECHANICAL EQUIPMENT
WORKSHOP A116	BB1	18'-0"	
ELEC. A115	BA1	10'-0"	
STAGE ACCESS A117	BD1	10'-0"	
STAGE STORAGE A120	BA1	14'-6"	MOUNT BELOW MECHANICAL EQUIPMENT
BAND STORAGE A124	BA1	14'-6"	MOUNT BELOW MECHANICAL EQUIPMENT
COSTUME STORAGE A125	BA1	14'-6"	
STORAGE A126	BA1	14'-6"	
ORCH. SHELL STOR. A122 /STAGE	BA2	22'-6"	
BLDG MAINT. FIRE PANEL/PHONE A141	BA1	8'-0"	
IDF A142	BA1	9'-6"	
SOUND & LIGHTING STORAGE A143	BA1	9'-6"	
STAIR A144	DB1	8'-0"	
STORAGE A145	BA1	9'-6"	
LEVEL 2			
CUSTODIAL A203	BA1	8'-6"	
ELEC. A205	BA1	8'-6"	
LEVEL 3			
STORAGE A300	BA2	8'-0"	
S/L A301	BA2	8'-0"	
FOLLOW SPOT A302	BA2	8'-0"	
S/L A304	BA2	8'-0"	
AV & LIGHTING RACK ROOM A303	BA2	8'-0"	
LEVEL 4			
GRID LEVEL	BA2	7' - 6"	

LIGHTING RELAY SCHEDULE

RELAY/ ZONE	LOAD DESCRIPTION / FIXTURE	VOLTAGE	DIMMING	SCHEDULE NOTES
x1	BUILDING MOUNTED LIGHTING	EW2	277	YES	2
x2	BUILDING MOUNTED LIGHTING EMG	EW2	277	YES	2
x3	BUILDING MOUNTED LIGHTING EMG	EL1	277	YES	2
x4	BUILDING MOUNTING LIGHTING	EL1	277	YES	4
x5	BUILDING MOUNTED LIGHTING	EW3	277	YES	2
x6	BUILDING MOUNTED LIGHTING EMG	EW3	277	YES	2
x7	PEDESTRIAN LIGHTING SOUTH EMG	EW4	277	YES	1,2
x8	PEDESTRIAN LIGHTING SOUTH	EG1 , ES1	277	YES	1,2
x9	SITE LIGHTING	E2	277	YES	2

GENERAL NOTES:
A. SEE SPECIFICATION SECTION 260923 FOR ADDITIONAL LIGHTING CONTROL SYSTEM REQUIREMENTS. PROVIDE ALL COMPONENTS, CABLING, HARDWARE, AND SOFTWARE FOR COMPLETE LIGHTING CONTROL SYSTEM.
B. COORDINATE WITH OWNER FOR SCHEDULING OF AUTOMATIC SHUT-OFF.
C. PROVIDE BARRIERS BETWEEN NORMAL AND EMERGENCY RELAYS FOR RELAY PANEL CONSTRUCTION.
D. PROVIDE BARRIERS BETWEEN RELAYS WITH DIFFERING VOLTAGES FOR RELAY PANEL CONSTRUCTION.
E. ALL RELAYS POWERED FROM A LIFE SAFETY CIRCUIT SHALL BE UL924 LISTED DEVICES AUTOMATICALLY TO FAIL CLOSED UPON DETECTION OF NORMAL POWER LOSS.

SCHEDULE NOTES:
1. DAWN TO DUSK VIA ASTRONOMIC TIME CLOCK. TURN OFF 20 MINUTES BEFORE DUSK AND 20 MINUTES AFTER DAWN.
2. REDUCE OUTPUT BY 50% FROM MIDNIGHT TO 6 AM. MANUAL SWITCH CONTROL SHALL OVERRIDE DIMMER OUTPUT.
3. DECORATIVE LIGHTING CONTROL SHUT OFF AT MIDNIGHT TO 6 AM.
4. LIGHTING DIMMED TO 50%

ADD-2

DLR GROUP
© DLR Group
STATE OF TEXAS
MARK JOSEPH NIECHWIADOWICZ
146025
LICENSED
PROFESSIONAL ENGINEER
TBPE FIRM REGISTRATION NUMBER F-1101

CRANDALL ISD HIGH SCHOOL
PAC ADDITION
13385 Fm 3039, Crandall, TX 75114

ISSUE FOR BID AND PERMIT
2024.07.25
REVISIONS
ADD-1 8/19/24
ADD-2 9/03/24

39-23712-00

LIGHTING SCHEDULES

E7.1

SWITCHBOARD: DP2K

LOCATION ELEC. A179
BUS RATING 600.0 A
MAIN BREAKER MLO
VOLTAGE: 480Y/277
PHASES: 3
WIRES: 4
SCCR: 21.2 KA

CKT	CIRCUIT DESCRIPTION	BKR TRIP	P	BKR TYPE	LOAD TYPE	LOAD (kVA)	NOTES
1	L2K VIA XFMR T2K	175.0 A	3		S; L; R; O; M	65	
2	MH2K	225.0 A	3		S; R; M	125	
3	H2K	100.0 A	3		S; L; M	10	
4	L2TK VIA XFMR T2TK	50.0 A	3		S; R; O	17	
5	ELEV 1	80.0 A	3		M	33	
6	RTU-6	110.0 A	3		M	74	
7							
8							
9							
10							
11							
12							
					TOTAL LOAD:	324 kVA	
					TOTAL AMPS:	390 A	

LOAD TYPE	LOAD DESCRIPTION	CONNECTED LOAD (VA)	DEMAND FACTOR	ESTIMATED DEMAND (VA)	DEMAND FACTOR NOTES	BKR TYPE	PANEL TOTALS
L	LIGHTING	9623 VA	100.00%	9623 VA	CONTINUOUS LOAD @ 125%	G = GFCI (5mA)	
R	RECEPTACLES	25660 VA	69.49%	17830 VA	FIRST 10KVA @ 100%, REMAINDER @ 50%	GP = GFCI (30mA)	**CONNECTED LOAD:** 324 kVA
K	KITCHEN	0 VA	0.00%	0 VA	NON-DWELLING KITCHEN EQUIPMENT, NEC ART. 220	ST = SHUNT TRIP	**ESTIMATED DEMAND:** 316 kVA
M	MOTOR	232940 VA	100.00%	232940 VA	LARGEST MOTOR, NEC ART. 430	LO = LOCK OUT	**CONNECTED CURRENT:** 390 A
C	COOLING	0 VA	0.00%	0 VA			**EMD CURRENT:** 380.4 A
H	HEATING	0 VA	0.00%	0 VA			
NC	NONCOINCIDENT	0 VA	0.00%	0 VA	NON-COINCIDENT LOADS, NEC ART. 220		
O	OTHER	55382 VA	100.00%	55382 VA			
Spare	SPARE	500 VA	100.00%	500 VA			

NOTES:

PANEL: H2K

LOCATION: ELEC. A179
BUS RATING: 100 A
MAIN BREAKER: 100 A
VOLTS: 480Y/277
PHASES: 3
WIRES: 4
SCCR: 19.1 KA
MOUNTING: SURFACE
FED FROM: DP2K
INTEGRAL SPD: NO ADD-1
LUG ACCESSORIES: NONE

CKT	CIRCUIT DESCRIPTION	BKR TRIP	P	BKR TYPE	LOAD TYPE	PHASE A (VA)		PHASE B (VA)		PHASE C (VA)		LOAD TYPE	BKR TYPE	P	BKR TRIP	CIRCUIT DESCRIPTION	CKT
1	L-AUD CHAMPER-SEATS	20	1		L	1,200	1,108					L		1	20	L-LEVEL 2 MEZZANINE A206 (VIA INVERTER)*	2
3	L-CATWALK STEP LIGHTS	20	1		L; M			1,080	2,088			L		1	20	L-CHAMBER, CATWALK LEVEL & GRID LEVEL*	4
5	L-AV, RACK ROOM, AUDENCE CHAMBER	20	1		L					1,328	360	L		1	20	L - EXTERIOR ILLUMINATED SIGNAGE	6
7	L-AUD CHAMPER-STEP	20	1		L	738	180					L		1	20	L - EXTERIOR ILLUMINATED SIGNAGE	8
9	L-STAGE BACK WALL-STEP	20	1		L			378	0			Spare		1	20	SPARE	10
11	L-MEZZANINE, EXTERIOR	20	1		L					658	0	Spare		1	20	SPARE	12
13	L-A205, A202, A204, A207	20	1		L	478	0					Spare		1	20	SPARE	14
15	SPARE	20	1		Spare			0	0			Spare		1	20	SPARE	16
17	SPARE	20	1		Spare					0	0	Spare		1	20	SPARE	18
19	SPARE	20	1		Spare	0	0					Spare		1	20	SPARE	20
21	SPARE	20	1		Spare			0	0			Spare		1	20	SPARE	22
23	SPARE	20	1		Spare					0	0	Spare		1	20	SPARE	24
25	SPARE	20	1		Spare	0	0					Spare		1	20	SPARE	26
27	SPARE	20	1		Spare			0	0			Spare		1	20	SPARE	28
29	SPARE	20	1		Spare					0	0	Spare		1	20	SPARE	30
31	SPARE	20	1		Spare	0	0					Spare		1	20	SPARE	32
33	SPARE	20	1		Spare			0	0			Spare		1	20	SPARE	34
35	SPARE	20	1		Spare					0	0	Spare		1	20	SPARE	36
37	SPARE	20	1		Spare	0	0					Spare		1	20	SPARE	38
39	SPARE	20	1		Spare			0	0			Spare		1	20	SPARE	40
41	SPARE	20	1		Spare					0	0	L		1	20	SPARE	42
					TOTAL LOAD:	3704 VA		3546 VA		2346 VA							
					TOTAL AMPS	14.0 A		13.5 A		8.5 A							

ADD-2

LOAD TYPE	LOAD DESCRIPTION	CONNECTED LOAD (VA)	DEMAND FACTOR	ESTIMATED DEMAND (VA)	DEMAND FACTOR NOTES	BKR TYPE	PANEL TOTALS
L	LIGHTING	9596 VA	100.00%	9596 VA	CONTINUOUS LOAD @ 125%	G = GFCI (5mA)	
R	RECEPTACLES	0 VA	0.00%	0 VA	FIRST 10KVA @ 100%, REMAINDER @ 50%	GP = GFP (30mA)	**CONNECTED LOAD:** 10 kVA
K	KITCHEN	0 VA	0.00%	0 VA	NON-DWELLING KITCHEN LOADS, NEC ART. 220	ST = SHUNT TRIP	**ESTIMATED DEMAND:** 10 kVA
M	MOTOR	0 VA	0.00%	0 VA	LARGEST MOTOR, NEC ART. 430	LO = LOCK OUT	**CONNECTED CURRENT:** 11.5 A
C	COOLING	0 VA	0.00%	0 VA			**EMD CURRENT:** 11.5 A
H	HEATING	0 VA	0.00%	0 VA			
O	OTHER	0 VA	0.00%	0 VA			
Spare	SPARE	0 VA	0.00%	0 VA			

NOTES:
A. CIRCUITS NOTED WITH " * " FED THROUGH INVERTER, SEE CENTRAL BATTERY INVERTER SCHEDULE ON E6.2

EXISTING PANEL: L4

LOCATION: ELEC ROOM U-13
BUS RATING: 250 A
MAIN BREAKER: MLO
VOLTS: 208Y/120
PHASES: 3
WIRES: 4
SCCR:
MOUNTING: SURFACE
FED FROM: DPLC
INTEGRAL SPD:
LUG ACCESSORIES: NONE

CKT	CIRCUIT DESCRIPTION	BKR TRIP	P	BKR TYPE	LOAD TYPE	PHASE A (VA)		PHASE B (VA)		PHASE C (VA)		LOAD TYPE	BKR TYPE	P	BKR TRIP	CIRCUIT DESCRIPTION	CKT
1	EXISTING - LR GOORIPOON REC	--	1	R		--	--							1	--	EXISTING - 502 OUTLETS	2
3	EXISTING - PROJECTOR REC	--	1	R				--	--					1	--	EXISTING - 502 ROLL UP DOOR	4
5	EXISTING - 501 - OUTLETS - NORTH WALL	--	1	R						--	--			1	--	EXISTING - 502 OUTLETS	6
7	EXISTING - 501 - SEATING OUTLETS - N	--	1	R		--	--							1	--	EXISTING - 502 OUTLETS	8
9	EXISTING - 501 - SEATING OUTLETS - S	--	1	R				--	--					1	--	EXISTING - 502 DISPOSAL	10
11	EXISTING - OVERHEAD VIDEO PROJECTOR	--	1	R						--	--			1	--	EXISTING - 502 MICROWAVE	12
13	EXISTING - PROJECTION SCREEN ON STAGE	--	1	R		--	--							1	--	EXISTING - 502 OUTLETS	14
15	EXISTING - OUTLETS - FRONT OF STAGE	--	1	R				--	--					2	--	EXISTING - 502 COOKTOP	16
17	EXISTING - 501 - STAGE CURTAIN	--	1	R						--	--						18
19	EXISTING - 501 - TV OUTLETS S WALL	--	1	R		--	--							2	--	EXISTING - 502 RANGE	20
21	EXISTING - 501 - TV OUTLETS S WALL	--	1	R				--	--								22
23	EXISTING - 503 - OUTLETS	--	1	R						--	--			1	--	EXISTING - 502 REFRIGERATOR	24
25	EXISTING - 503 - OUTLETS	--	1	R		--	--							1	--	EXISTING - 502 OUTLETS	26
27	EXISTING - 503.1 - GFI OUTLET	--	1	R				--	1,260			R		1	20	R - OFFICE E102 & WORKROOM E101	28
29	EXISTING - 503.1-&2 - *CONT	--	1	R						--	720	R		1	20	R - OFFICE A199 (1)	30
31	EXISTING - 503.1-&2 - GFI OUTLET	--	1	R		--	900					R		1	20	R - OFFICE E102 & OFFICE E103 (1)	32
33	EXISTING - 503.1-&2 - CONT	--	1	R				--	540			R		1	20	R - PERCUSSION E106 (1)	34
35	R-BAND ROOM NORTH WALL E100 (1)	20	1		R					720	900	R	G	1	20	R - VENDING MACHINE- G114 (2)	36
37	R-PERCUSSION E106 (1)	20	1		R	1,440	900					R	G	1	20	R - VENDING MACHINE- G114 (2)	38
39	R-B.O.H. / VESTIBULE A127 (1)	20	1		R			540	900			R	G	1	20	R - VENDING MACHINE- G114 (2)	40
41	R-BAND ROOM WEST WALL E100 (1)	20	1		R					720	900	R	G	1	20	R - VENDING MACHINE- G114 (2)	42
43	R-BAND ROOM EAST WALL E200 (1)	20	1		R	900											44
45	R-OFFICE A140 (1)	20	1		R			720									46
47	R PRACTICE A202 (1)	20	1		R					540							48
49	R -OFFICE A176 (1)	20	1		R	720											50
51																	52
53																	54
55	EXISTING	20	2		Spare	0											56
57								0									58
59	EXISTING	20	1		Spare					0							60
61	EXISTING	20	1		Spare	0	0					Spare		2	60	EXISTING	62
63	SPARE	20	1		Spare			0	0								64
65	SPARE	20	1		Spare					0	0	Spare		1	20	EXISTING	66
67	EXISTING	20	1		Spare	0	0					Spare		1	20	EXISTING	68
69	EXISTING	20	1		Spare			0	0			Spare		1	20	EXISTING	70
71	EXISTING	20	1		Spare					0	0	Spare		1	20	EXISTING	72
73	EXISTING	20	1		Spare	0	0					Spare		1	20	EXISTING	74
75	EXISTING	20	1		Spare			0	0			Spare		1	20	EXISTING	76
77	EXISTING	20	1		Spare					0	--			1	--	SPACE	78
79	EXISTING	20	1		Spare	0	--							1	--	SPACE	80
81	EXISTING	20	1		Spare			0	--					1	--	SPACE	82
83	EXISTING	20	1		Spare					0	--			1	--	SPACE	84
					TOTAL LOAD:	4860 VA		3960 VA		4500 VA							
					TOTAL AMPS	41.2 A		33.0 A		38.2 A							

LOAD TYPE	LOAD DESCRIPTION	CONNECTED LOAD (VA)	DEMAN D...	ESTIMATED DEMAND (VA)	DEMAND FACTOR NOTES	BKR TYPE	PANEL TOTALS
L	LIGHTING	0 VA	0.00%	0 VA	CONTINUOUS LOAD @ 125%	G = GFCI (5mA)	
R	RECEPTACLES	13320 VA	87.54%	11660 VA	FIRST 10KVA @ 100%, REMAINDER @ 50%	GP = GFCI (30mA)	**CONNECTED LOAD:** 13 kVA
K	KITCHEN	0 VA	0.00%	0 VA	NON-DWELLING KITCHEN LOADS, NEC ART. 220	ST = SHUNT TRIP	**ESTIMATED DEMAND:** 12 kVA
M	MOTOR	0 VA	0.00%	0 VA	LARGEST MOTOR, NEC ART. 430	LO = LOCK OUT	**CONNECTED CURRENT:** 37.0 A
C	COOLING	0 VA	0.00%	0 VA			**EMD CURRENT:** 32.4 A
H	HEATING	0 VA	0.00%	0 VA			
O	OTHER	0 VA	0.00%	0 VA			
Spare	SPARE	0 VA	0.00%	0 VA			

NOTES:
SIEMENS P1 PANELBOARD
(1) CIRCUIT TO SPARE 20A/1P BREAKER IN PANEL.
(2) PROVIDE NEW 20A/1P GFCI BREAKER IN PANEL.

PANEL: L2TK

LOCATION: ELEC. A179
BUS RATING: 100 A
MAIN BREAKER: 100 A
VOLTS: 208Y/120
PHASES: 3
WIRES: 4
SCCR: 2.1 KA
MOUNTING: SURFACE
FED FROM: T2TK
INTEGRAL SPD: YES
LUG ACCESSORIES: NONE

CKT	CIRCUIT DESCRIPTION	BKR TRIP	P	BKR TYPE	LOAD TYPE	PHASE A (VA)		PHASE B (VA)		PHASE C (VA)		LOAD TYPE	BKR TYPE	P	BKR TRIP	CIRCUIT DESCRIPTION	CKT
1	R-CATWALK BOH LEFT	20	1		R	360	1,000					R		1	20	AV RACK-AV RACK ROOM A303	2
3	AV DISPLAY-LOBBY A101	20	1		R			500	1,000			R		1	20	AV RACK-AV RACK ROOM A303	4
5	R - AV DISPLAY-LOBBY A101	20	1		R					500	1,000	R		1	20	AV RACK-AV RACK ROOM A303	6
7	R-CATWALK BOH RIGHT	20	1		R	360	1,000					R		1	20	AV RACK-AV RACK ROOM A303	8
9	AV DISPLAY-LOBBY A201	20	1		O			500	1,500			R		1	30	AV RACK-AV RACK ROOM A303	10
11	PROJECTOR-CONTROL ROOM A150	20	2		R					1,500	1,500	R		1	30	AV RACK-AV RACK ROOM A303	12
13						1,500	180					R		1	20	PROJECTOR-CONTROL ROOM A150	14
15	AV DISPLAY-S/L A111	20	1		R			500	500			O		1	20	AV DISPLAY-S/L A146	16
17	R-AUDIENCE CHAMBER A148 BACK	20	1		R					180	360	R		1	20	R-FOLLOW SPOT A302	18
19	R-CONTROL ROOM A207	20	1		R	360	0					Spare		1	20	SPARE	20
21	R-AUDIENCE CHAMBER A148 BACK	20	1		R			180	0			Spare		1	20	SPARE	22
23	R-CATWALK WEST CENTER	20	1		R					360	0	Spare		1	20	SPARE	24
25	R-CATWALK SOUTH EAST	20	1		R	360	0					Spare		1	20	SPARE	26
27	R-CONTROL ROOM A207	20	1		R			360	0			Spare		1	20	SPARE	28
29	R-CATWALK EAST CENTER	20	1		R					360	0	Spare		1	20	SPARE	30
31	R-CATWALK CENTER	20	1		R	360	0					Spare		1	20	SPARE	32
33	R-CATWALK SOUTH WEST	20	1		R			360	0			Spare		1	20	SPARE	34
35	SPARE	20	1		Spare					0	0	Spare		1	20	SPARE	36
37	SPARE	20	1		Spare	0	0					Spare		1	20	SPARE	38
39	R-CATWALK CENTER	20	1		R			360	0			Spare		1	20	SPARE	40
41	SPARE	20	1		Spare					0	0	Spare		1	20	SPARE	42
					TOTAL LOAD:	5480 VA		5760 VA		5760 VA							
					TOTAL AMPS	45.7 A		48.4 A		48.4 A							

ADD-1

LOAD TYPE	LOAD DESCRIPTION	CONNECTED LOAD (VA)	DEMAND FACTOR	ESTIMATED DEMAND (VA)	DEMAND FACTOR NOTES	BKR TYPE	PANEL TOTALS
L	LIGHTING	0 VA	0.00%	0 VA	CONTINUOUS LOAD @ 125%	G = GFCI (5mA)	
R	RECEPTACLES	16000 VA	81.25%	13000 VA	FIRST 10KVA @ 100%, REMAINDER @ 50%	GP = GFP (30mA)	**CONNECTED LOAD:** 17 kVA
K	KITCHEN	0 VA	0.00%	0 VA	NON-DWELLING KITCHEN LOADS, NEC ART. 220	ST = SHUNT TRIP	**ESTIMATED DEMAND:** 14 kVA
M	MOTOR	0 VA	0.00%	0 VA	LARGEST MOTOR, NEC ART. 430	LO = LOCK OUT	**CONNECTED CURRENT:** 47.2 A
C	COOLING	0 VA	0.00%	0 VA			**EMD CURRENT:** 38.9 A
H	HEATING	0 VA	0.00%	0 VA			
O	OTHER	1000 VA	100.00%	1000 VA			
Spare	SPARE	0 VA	0.00%	0 VA			

NOTES:
PROVIDE WITH SEPARATE ISOLATED GROUND BUS. 200% RATED NEUTRAL

PANEL: L2K

LOCATION: ELEC. A179
BUS RATING: 400 A
MAIN BREAKER: 400 A
VOLTS: 208Y/120
PHASES: 3
WIRES: 4
SCCR: 6.7 KA
MOUNTING: SURFACE
FED FROM: T2K
INTEGRAL SPD: YES
LUG ACCESSORIES: NONE

CKT	CIRCUIT DESCRIPTION	BKR TRIP	P	BKR TYPE	LOAD TYPE	PHASE A (VA)		PHASE B (VA)		PHASE C (VA)		LOAD TYPE	BKR TYPE	P	BKR TRIP	CIRCUIT DESCRIPTION	CKT
1	ELEV CAB LIGHTS/FAN	20	1		M	1,440	1,080					R		1	20	R - LOBBY A201,ELEC A205	2
3	R - FOLLOW SPOT A153	20	1		R			720	900			R		1	20	R - PROJECTOR RM A207	4
5	L-CONTROL ROOM A150 TRACK	20	1		L					27	1,080	R		1	20	R - AV LIGHTING AND RACK ROOM	6
7	HAND DRYER-MENS A110	20	1		O	1,000	1,000					O		1	20	HAND DRYER-MENS A204	8
9	HAND DRYER-WOMENS A171	20	1		O			1,000	1,000			O		1	20	HAND DRYER-WOMENS A202	10
11	FLUSH VALVES-WOMENS A175	20	1		O					500	500	O		1	20	FLUSH VALVES-WOMENS A202	12
13	FLUSH VALVES-WOMENS A175	20	1		O	500	500					O		1	20	FLUSH VALVES-WOMENS A202	14
15	FLUSH VALVES-MENS A175	20	1		O			500	500			O		1	20	FLUSH VALVES-MENS A204	16
17	R - MENS / WOMEN TOILETS A175	20	1		R					1,260	900	R		1	20	R-TOILETS A202-A204	18
19	AUTO DOOR OPERATOR - LOBBY A101	20	1		O	150	0					Spare		1	20	SPARE	20
21	ALP	20	1		O			1,500	0			Spare		1	20	SPARE	22
23	RELAY PANEL ELECTRONICS	20	1		O					500	0	Spare		1	20	SPARE	24
25	EMERGENCY BYPASS DETECTION KIT	20	1		O	1,000	0					Spare		1	20	SPARE	26
27	DMX EMERG BYPASS	20	1		O			1,000	0			Spare		1	20	SPARE	28
29	R-ELEC A300A	20	1		R					180	0	Spare		1	20	SPARE	30
31	UPS-ELEC. A205	30	2		R	1,500	9,607					O		3	200	LCP-01	32
33								1,500	9,607								34
35	SPARE	20	1		Spare					0	9,607						36
37	SPARE	20	1		Spare	0	4,804					O		3	100	LCP-02	38
39	SPARE	20	1		Spare			0	4,804								40
41	SPARE	20	1		Spare					0	4,804						42
					TOTAL LOAD:	22581 VA		23031 VA		19358 VA							
					TOTAL AMPS	192.3 A		196.1 A		161.3 A							

ADD-1

LOAD TYPE	LOAD DESCRIPTION	CONNECTED LOAD (VA)	DEMAND FACTOR	ESTIMATED DEMAND (VA)	DEMAND FACTOR NOTES	BKR TYPE	PANEL TOTALS
L	LIGHTING	27 VA	100.00%	27 VA	CONTINUOUS LOAD @ 125%	G = GFCI (5mA)	
R	RECEPTACLES	9120 VA	100.00%	9120 VA	FIRST 10KVA @ 100%, REMAINDER @ 50%	GP = GFP (30mA)	**CONNECTED LOAD:** 65 kVA
K	KITCHEN	0 VA	0.00%	0 VA	NON-DWELLING KITCHEN LOADS, NEC ART. 220	ST = SHUNT TRIP	**ESTIMATED DEMAND:** 65 kVA
M	MOTOR	1440 VA	100.00%	1440 VA	LARGEST MOTOR, NEC ART. 430	LO = LOCK OUT	**CONNECTED CURRENT:** 180.3 A
C	COOLING	0 VA	0.00%	0 VA			**EMD CURRENT:** 180.3 A
H	HEATING	0 VA	0.00%	0 VA			
O	OTHER	54382 VA	100.00%	54382 VA			
Spare	SPARE	0 VA	0.00%	0 VA			

NOTES:

EXISTING PANEL: C4

LOCATION: ELEC ROOM U-13
BUS RATING: 125 A
MAIN BREAKER: 125 A
VOLTS: 208Y/120
PHASES: 3
WIRES: 4
SCCR: 10 kA
MOUNTING: SURFACE
FED FROM: DPLC
INTEGRAL SPD:
LUG ACCESSORIES: NONE

CKT	CIRCUIT DESCRIPTION	BKR TRIP	P	BKR TYPE	LOAD TYPE	PHASE A (VA)		PHASE B (VA)		PHASE C (VA)		LOAD TYPE	BKR TYPE	P	BKR TRIP	CIRCUIT DESCRIPTION	CKT
1	EXISTING	20	1		Spare	0	0					Spare		3	60	SPARE	2
3	EXISTING	20	1		Spare			0	0								4
5	EXISTING	20	1		Spare					0	0						6
7	EXISTING	20	1		Spare	0	180					R		1	20	R-BAND ROOM A200 PROJECTOR (1)	8
9	EXISTING	20	1		Spare			0	180			R		1	20	R-BAND ROOM A200 (1)	10
11	EXISTING	20	1		Spare					0	0	Spare		1	20	EXISTING	12
13	EXISTING	20	1		Spare	0	0					Spare		1	20	EXISTING	14
15	EXISTING	20	1		Spare			0	0			Spare		1	20	EXISTING	16
17	EXISTING	20	1		Spare					0	0	Spare		1	20	EXISTING	18
19	SPARE	20	1		Spare	0	0					Spare		1	20	EXISTING	20
21	EXISTING	20	1		Spare			0	0			Spare		1	20	EXISTING	22
23	EXISTING	20	1		Spare					0	0	Spare		1	20	EXISTING	24
25	EXISTING	20	1		Spare	0	0					Spare		1	20	EXISTING	26
27	EXISTING	20	1		Spare			0	0			Spare		1	20	EXISTING	28
29	EXISTING	20	1		Spare					0	0	Spare		1	20	EXISTING	30
31	EXISTING	30	1		Spare	0	0					Spare		1	20	SPARE	32
33	EXISTING	20	1		Spare			0	0			Spare		1	20	SPARE	34
35	SPARE	20	1		Spare					0	0	Spare		1	20	SPARE	36
37	SPARE	30	3		Spare	0	0					Spare		1	20	SPARE	38
39								0	--					1	--	SPACE	40
41										0	--			1	--	SPACE	42
					TOTAL LOAD:	180 VA		180 VA		0 VA							
					TOTAL AMPS	1.7 A		1.7 A		0.0 A							

LOAD TYPE	LOAD DESCRIPTION	CONNECTED LOAD (VA)	DEMAN D...	ESTIMATED DEMAND (VA)	DEMAND FACTOR NOTES	BKR TYPE	PANEL TOTALS
L	LIGHTING	0 VA	0.00%	0 VA	CONTINUOUS LOAD @ 125%	G = GFCI (5mA)	
R	RECEPTACLES	360 VA	100.00%	360 VA	FIRST 10KVA @ 100%, REMAINDER @ 50%	GP = GFCI (30mA)	**CONNECTED LOAD:** 0 kVA
K	KITCHEN	0 VA	0.00%	0 VA	NON-DWELLING KITCHEN LOADS, NEC ART. 220	ST = SHUNT TRIP	**ESTIMATED DEMAND:** 0 kVA
M	MOTOR	0 VA	0.00%	0 VA	LARGEST MOTOR, NEC ART. 430	LO = LOCK OUT	**CONNECTED CURRENT:** 1.0 A
C	COOLING	0 VA	0.00%	0 VA			**EMD CURRENT:** 1.0 A
H	HEATING	0 VA	0.00%	0 VA			
O	OTHER	0 VA	0.00%	0 VA			
Spare	SPARE	0 VA	0.00%	0 VA			

NOTES:
SIEMENS P1 PANELBOARD. PANEL IS EQUIPED WITH ISOLATED GROUND BUS AND 200% NEUTRAL
(1) CIRCUIT TO SPARE 20A/1P BREAKER IN PANEL.

PANEL: MH2K

LOCATION: ELEC. A179
BUS RATING: 225 A
MAIN BREAKER: 225 A
VOLTS: 480Y/277
PHASES: 3
WIRES: 4
SCCR: 20.7 KA
MOUNTING: SURFACE
FED FROM: DP2K
INTEGRAL SPD: NO
LUG ACCESSORIES: NONE

CKT	CIRCUIT DESCRIPTION	BKR TRIP	P	BKR TYPE	LOAD TYPE	PHASE A (VA)		PHASE B (VA)		PHASE C (VA)		LOAD TYPE	BKR TYPE	P	BKR TRIP	CIRCUIT DESCRIPTION	CKT
1	EWH-8	30	3		M	8,000	0					Spare		1	20	SPARE	2
3								8,000	0			Spare		1	20	SPARE	4
5										8,000	0	Spare		1	20	SPARE	6
7	EWH-11	30	3		M	8,000	0					Spare		1	20	SPARE	8
9								8,000	0			Spare		1	20	SPARE	10
11										8,000	0	Spare		1	20	SPARE	12
13	SPACE	--	1			--	0					Spare		3	30	SPARE	14
15	SPACE	--	1					--	0								16
17	SPACE	--	1							--	0						18
19	SPACE	--	1			--	0					Spare		3	20	SPARE	20
21	SPACE	--	1					--	0								22
23	SPACE	--	1							--	0						24
25	SPACE	--	1			--	0					Spare		1	20	SPARE	26
27	SPACE	--	1					--	0			Spare		1	20	SPARE	28
29	SPACE	--	1							--	0	Spare		1	20	SPARE	30
31	SPACE	--	1			--	0					Spare		1	20	SPARE	32
33	SPACE	--	1					--	0			Spare		1	20	SPARE	34
35	SPACE	--	1							--	500	Spare		1	20	2ND LVL- FIRE/SMOKE DAMPERS	36
37	SPACE	--	1			--	28,451					Spare; R; M		3	175	ML2K VIA XFMR TM2K	38
39	SPACE	--	1					--	25,001								40
41	SPACE	--	1							--	23,107						42
					TOTAL LOAD:	44451 VA		41001 VA		39607 VA							
					TOTAL AMPS	161.3 A		148.8 A		143.0 A							

LOAD TYPE	LOAD DESCRIPTION	CONNECTED LOAD (VA)	DEMAND FACTOR	ESTIMATED DEMAND (VA)	DEMAND FACTOR NOTES	BKR TYPE	PANEL TOTALS
L	LIGHTING	0 VA	0.00%	0 VA	CONTINUOUS LOAD @ 125%	G = GFCI (5mA)	
R	RECEPTACLES	540 VA	100.00%	540 VA	FIRST 10KVA @ 100%, REMAINDER @ 50%	GP = GFP (30mA)	**CONNECTED LOAD:** 125 kVA
K	KITCHEN	0 VA	0.00%	0 VA	NON-DWELLING KITCHEN LOADS, NEC ART. 220	ST = SHUNT TRIP	**ESTIMATED DEMAND:** 125 kVA
M	MOTOR	124019 VA	100.00%	124019 VA	LARGEST MOTOR, NEC ART. 430	LO = LOCK OUT	**CONNECTED CURRENT:** 150.4 A
C	COOLING	0 VA	0.00%	0 VA			**EMD CURRENT:** 150.4 A
H	HEATING	0 VA	0.00%	0 VA			
O	OTHER	0 VA	0.00%	0 VA			
Spare	SPARE	500 VA	100.00%	500 VA			

NOTES:

PANEL: ML2K

LOCATION: ELEC. A179
BUS RATING: 400 A
MAIN BREAKER: 400 A
VOLTS: 208Y/120
PHASES: 3
WIRES: 4
SCCR: 8.2 KA
MOUNTING: SURFACE
FED FROM: TM2K
INTEGRAL SPD: NO
LUG ACCESSORIES: NONE

CKT	CIRCUIT DESCRIPTION	BKR TRIP	P	BKR TYPE	LOAD TYPE	PHASE A (VA)		PHASE B (VA)		PHASE C (VA)		LOAD TYPE	BKR TYPE	P	BKR TRIP	CIRCUIT DESCRIPTION	CKT
1	EF-2	15	1		M	792	1,966					M		2	20	OU-06, IU-06	2
3	R-ROOF SOUTH	20	1		R			540	1,966								4
5	EWH-12	40	2		M					4,150	1,444	M		2	20	OU-07, IU-07	6
7						4,150	1,444										8
9	EWH-6	20	2		M			1,800	1,362			M		2	15	OU-08, IU-08	10
11										1,800	1,362						12
13	EWH-9	40	2		M	4,150	0					Spare		2	20	SPARE	14
15								4,150	0								16
17	EWH-10	40	2		M					4,150	1,444	M		2	20	OU-10, IU-10	18
19						4,150	1,444										20
21	OU-01, IU-01	15	2		M			1,279	0			Spare		1	20	SPARE	22
23										1,279	0	Spare		1	20	SPARE	24
25	OU-02, IU-02	20	2		M	1,966	0					Spare		1	20	SPARE	26
27								1,966	4,150			M		2	40	EWH-7	28
29	OU-03, IU-03	20	2		M					1,966	4,150						30
31						1,966	4,150					M		2	40	EWH-13	32
33	OU-04, IU-04	15	2		M			1,362	4,150								34
35										1,362	0	Spare		1	20	SPARE	36
37	OU-05, IU-05	15	2		M	832	1,444					M		2	20	OU-09, IU-09	38
39								832	1,444								40
41	SPARE	20	1		Spare					0	0	Spare		1	20	SPARE	42
					TOTAL LOAD:	28451 VA		25001 VA		23107 VA							
					TOTAL AMPS	239.5 A		210.8 A		192.6 A							

ADD-1

LOAD TYPE	LOAD DESCRIPTION	CONNECTED LOAD (VA)	DEMAND FACTOR	ESTIMATED DEMAND (VA)	DEMAND FACTOR NOTES	BKR TYPE	PANEL TOTALS
L	LIGHTING	0 VA	0.00%	0 VA	CONTINUOUS LOAD @ 125%	G = GFCI (5mA)	
R	RECEPTACLES	540 VA	100.00%	540 VA	FIRST 10KVA @ 100%, REMAINDER @ 50%	GP = GFP (30mA)	**CONNECTED LOAD:** 77 kVA
K	KITCHEN	0 VA	0.00%	0 VA	NON-DWELLING KITCHEN LOADS, NEC ART. 220	ST = SHUNT TRIP	**ESTIMATED DEMAND:** 77 kVA
M	MOTOR	76019 VA	100.00%	76019 VA	LARGEST MOTOR, NEC ART. 430	LO = LOCK OUT	**CONNECTED CURRENT:** 212.5 A
C	COOLING	0 VA	0.00%	0 VA			**EMD CURRENT:** 212.5 A
H	HEATING	0 VA	0.00%	0 VA			
O	OTHER	0 VA	0.00%	0 VA			
Spare	SPARE	0 VA	0.00%	0 VA			

NOTES:
PROVIDE WITH SEPARATE ISOLATED GROUND BUS. 200% RATED NEUTRAL

DP2K	H2K	L4
L2TK	L2K	C4
MH2K	ML2K	

MARK JOSEPH NIECHWIADOWICZ
146025
09/03/2024
TBPE FIRM REGISTRATION NUMBER F-1101

CRANDALL ISD HIGH SCHOOL
PAC ADDITION
13385 Fm 3039, Crandall, TX 75114

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2024.07.25
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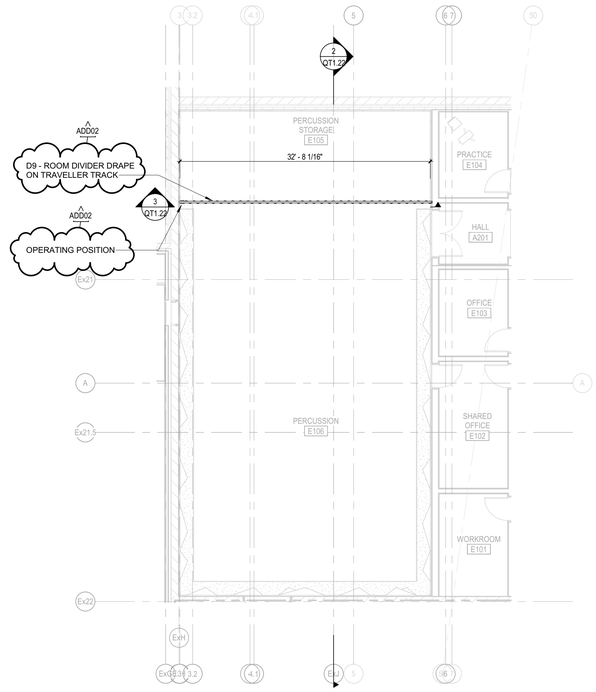
ADD-1 8/19/24
ADD-2 9/03/24

39-23712-00

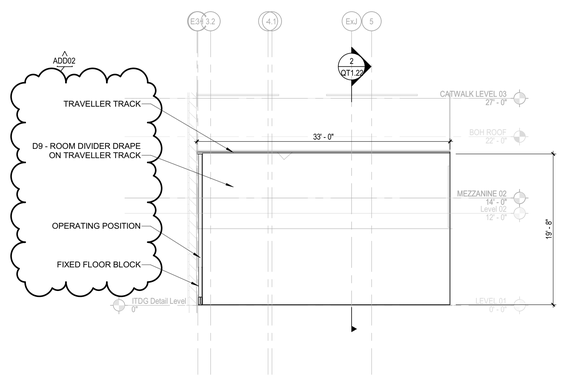
ELECTRICAL SCHEDULES

E7.4



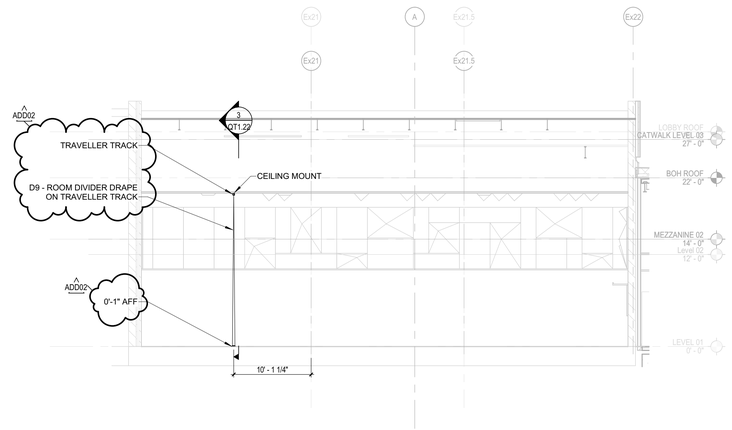
1 QT1.22 SCALE: 1/8" = 1'-0"

THEATRICAL DRAPERY PLAN - LEVEL 01, PERCUSSION ROOM



3 QT1.22 SCALE: 1/8" = 1'-0"

THEATRICAL DRAPERY SECTION PERCUSSION ROOM ELEVATION



2 QT1.22 SCALE: 1/8" = 1'-0"

THEATRICAL DRAPERY SECTION - PERCUSSION ROOM

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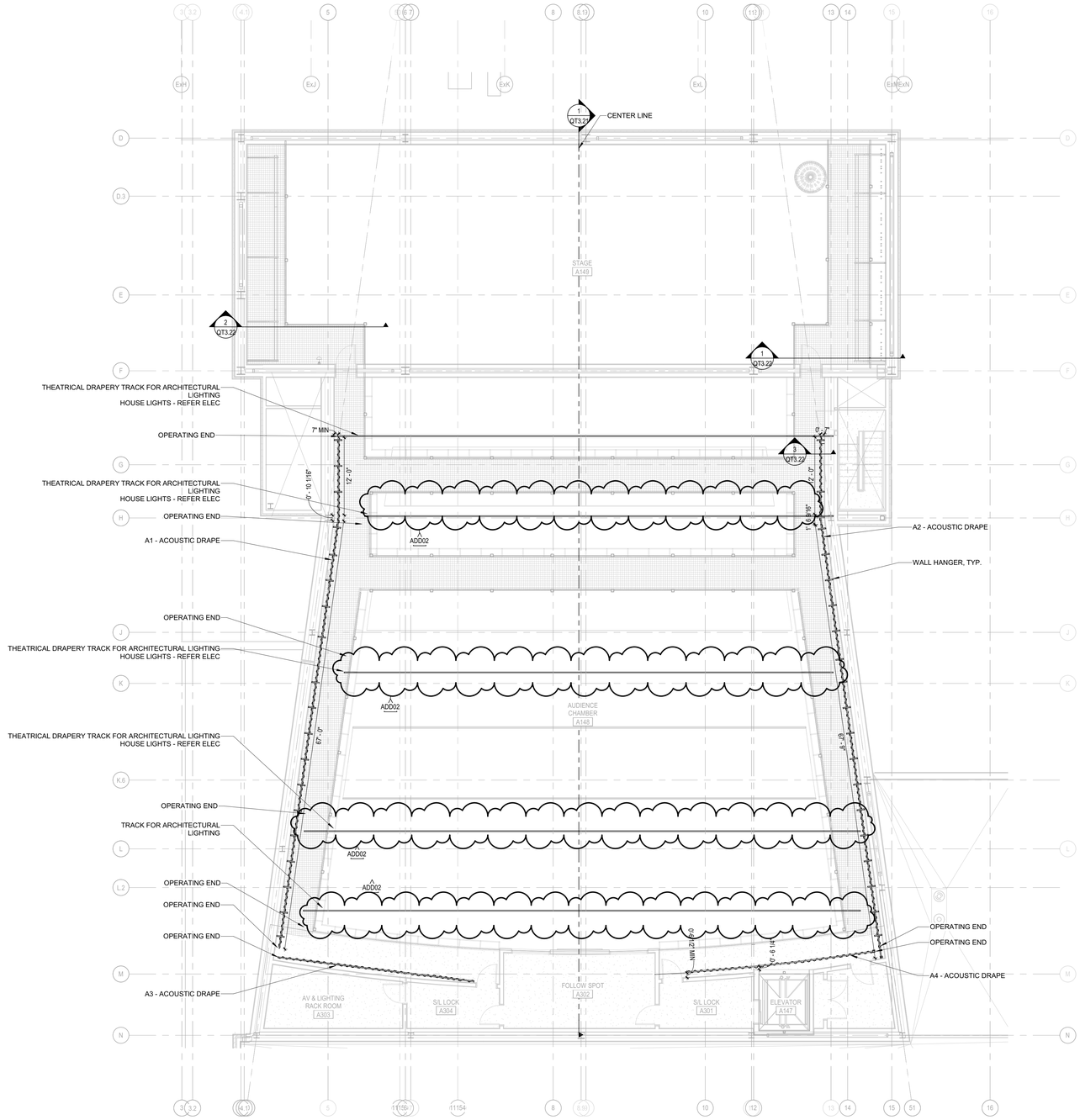
LEVEL 1 - THEATRICAL DRAPERY PLAN AND SECTION - PERCUSSION ROOM

QT1.22



THEATRICAL AND ACOUSTIC DRAPERY PLAN - CATWALK LEVEL

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

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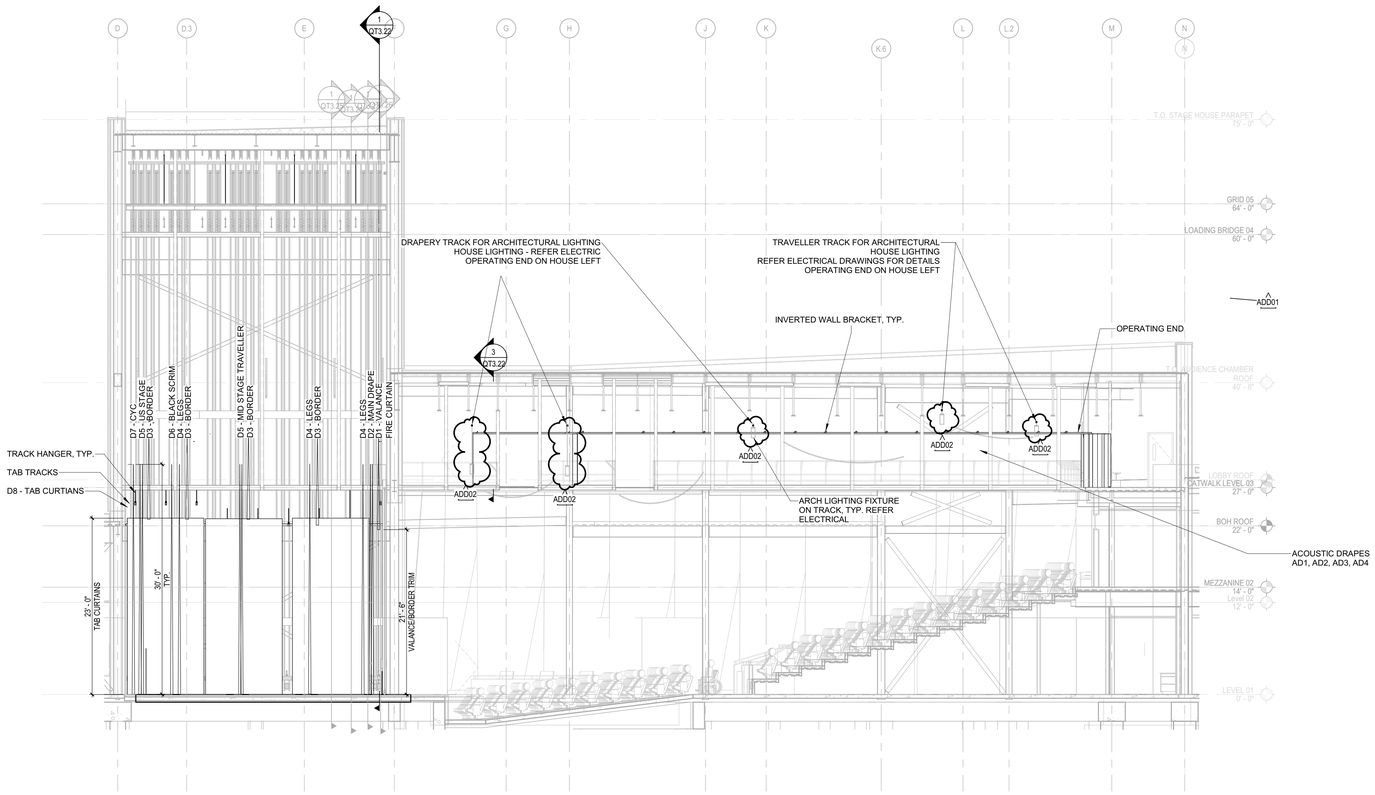
LEVEL 2 - THEATRICAL AND ACOUSTIC DRAPERY PLAN, CATWALK

QT1.23



THEATRICAL DRAPERY LONGITUDINAL SECTION

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

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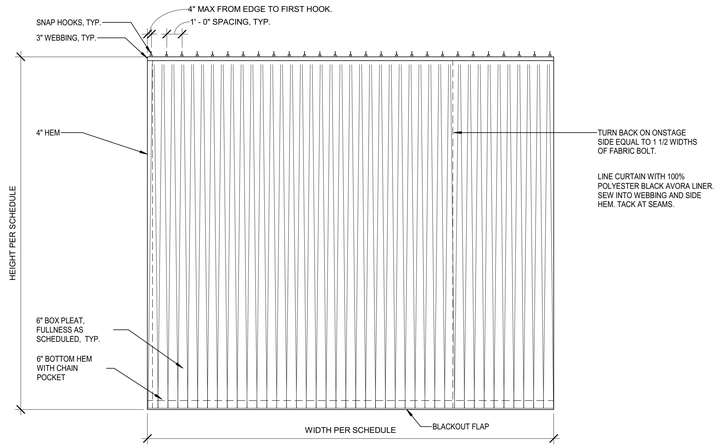
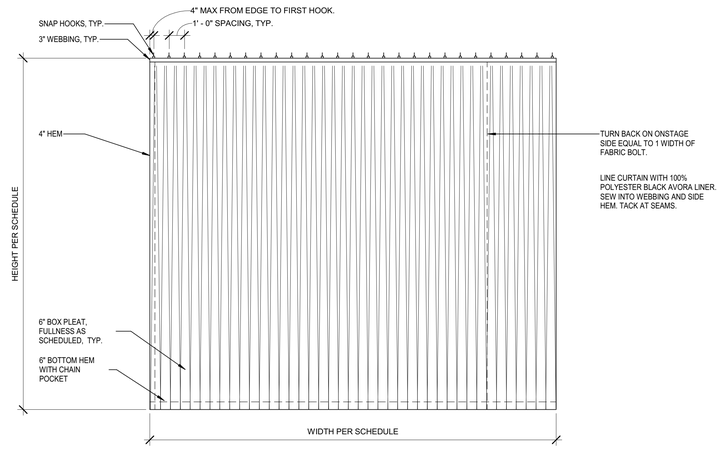
THEATRICAL
DRAPERY,
LONGITUDINAL
SECTION

QT3.21

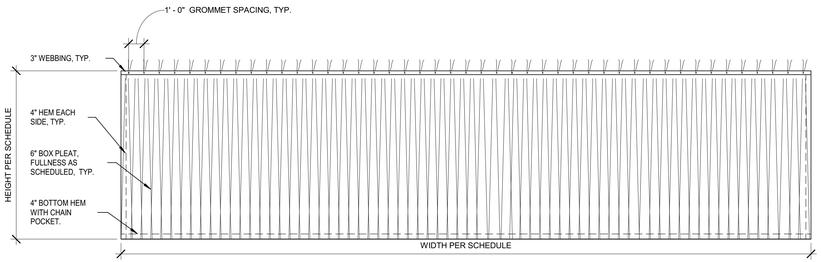
ADD02



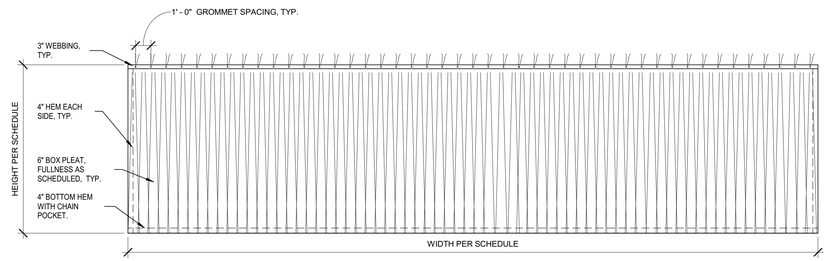
4 QT5.21 HOUSE CURTAIN DETAIL
SCALE: 1/4" = 1'-0"



3 QT5.21 VELOUR TRAVELER W/ FULLNESS DETAIL
SCALE: 1/4" = 1'-0"



5 QT5.21 MASKING BORDER DETAIL
SCALE: 1/4" = 1'-0"



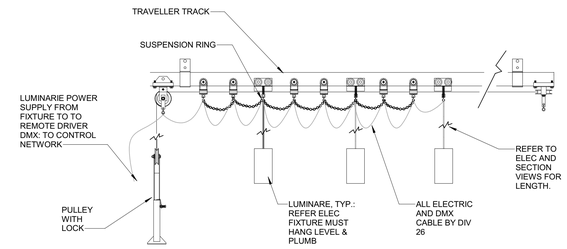
6 QT5.21 HOUSE VALANCE DETAIL
SCALE: 1/4" = 1'-0"

STAGE AND ACOUSTIC DRAPERY SCHEDULE

QTY. TO FURNISH	DRAPERY TYPE	COLOR	FINISHED DIMENSIONS (PER PANEL) ADDED FULLNESS	WIDTH	HEIGHT	SIDE HEM RETURN ONSTAGE	SIDE HEM RETURN OFFSTAGE	BOTTOM HEM	TOP FINISH	LOCATION	KEY NOTES
1	D1 - VALANCE	REFER ARCH	100%	60'-0"	12'-0"	4"	4"	2" + CHAIN POCKET	HIDDEN WEBBING GROMMETS AND TIES	A119 STAGE	1
2	D2- MAIN DRAPE	REFER ARCH	100%	35.'-0"	30'-0"	6"	6"	8" + CHAIN POCKET AND FLAP	SNAP HOOKS	A119 STAGE	1, 2
4	D3 - BORDER	BLACK	FLAT	60'-0"	12'-0"	4"	4"	4" CHAIN POCKET	WEBBING GROMMETS AND TIES	A119 STAGE	3
4	D4 - LEG	BLACK	FLAT	10'-0"	30'-0"	8"	8"	4" CHAIN POCKET	WEBBING GROMMETS AND TIES	A119 STAGE	3
4	D5 - TRAVELER PANEL	BLACK	FLAT	32'-0"	30'-0"	4"	4"	5" + CHAIN POCKET	SNAP HOOKS	A119 STAGE	2
1	D6 - BLACK SCRIM	BLACK	FLAT	60-0"	30'-0"	4"	4"	5" FLAT + PIPE POCKET	WEBBING GROMMETS AND TIES	A119 STAGE	3
1	D7 - IFR CYCLORAMA	WHITE	FLAT	60'-0"	30'-0"	4"	4"	5" FLAT + PIPE POCKET WITH FLAP	WEBBING GROMMETS AND TIES	A119 STAGE	3
8	D8 - MASKING TAB PANEL	BLACK	FLAT	10'-0"	24'-6"	4"	4"	4" CHAIN POCKET	SNAP HOOKS	A119 STAGE	2
1	AD1 -...	BLACK	100%	80'-0"	7'-9 1/2"	4"	4"	4" CHAIN POCKET	SNAP HOOKS	A148 CATWALK	2
1	AD2 -...	BLACK	100%	80'-0"	7'-9 1/2"	4"	4"	4" CHAIN POCKET	SNAP HOOKS	A148 CATWALK	2
1	AD3 -...	BLACK	100%	30'-0"	7'-9 1/2"	4"	4"	4" CHAIN POCKET	SNAP HOOKS	A148 CATWALK	2
1	AD4 - ACOUSTIC DRAPES	BLACK	100%	30'-0"	7'-9 1/2"	4"	4"	4" CHAIN POCKET	SNAP HOOKS	A148 CATWALK	2
4	D9 - ROOM DIVIDER	REFER ARCH	50%	33'-0"	19'-9"	4"	4"	5" + CHAIN POCKET	SNAP HOOKS	E106	2

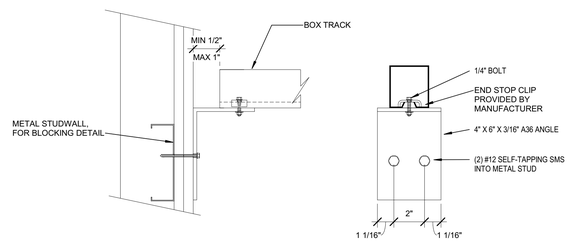
NOTES:
1) REFER TO DRAWINGS FOR INSTALLATION LOCATIONS OF DRAPERY.
2) ALL DRAPERY DIMENSIONS SHALL BE FIELD-VERIFIED AGAINST INSTALLED BATTEN AND TRACK ELEVATIONS PRIOR TO COMMENCEMENT OF SEWING.
3) REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
4) PROVIDE 1 HAMPER FOR TH...

KEY NOTES:
1) REFER TO ARCHITECTURAL FINISH SCHEDULE FOR DRAPERY COLOR SELECTION.
2) CLIP TO TRAVELER TRACK CARRIERS USING SNAP CLIPS (TO BE FURNISHED BY DRAPERY MANUFACTURER).
3) TIE DIRECTLY TO PIPE BATTEN OR RAILING WHERE SHOWN USING TIE LINE (TO BE FURNISHED BY DRAPERY MANUFACTURER).



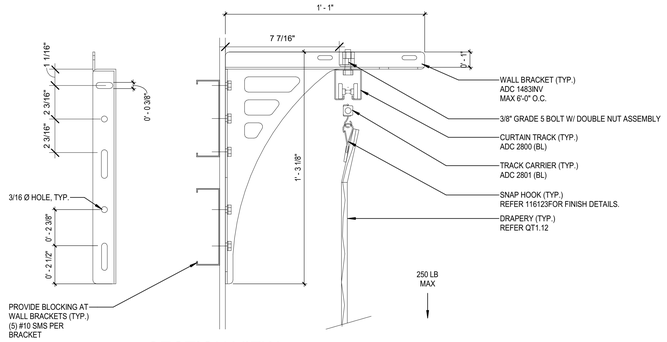
NOTE:
A. TRAVELLER TRACK TO ACCESS FIXTURES FOR MAINTENANCE.
B. FIXTURE AND CORD BY DIV 26.
C. TRACK BY RIGGING CONTRACTOR

1 QT5.21 TRACK FOR HOUSE LIGHT
SCALE: 1" = 1'-0"

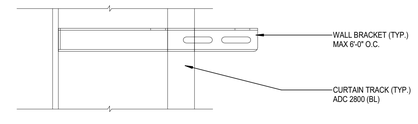


BOX TRACK CONNECTION

2 QT5.21 DRAPERY TRACK END BRACKETS
SCALE: 3" = 1'-0"

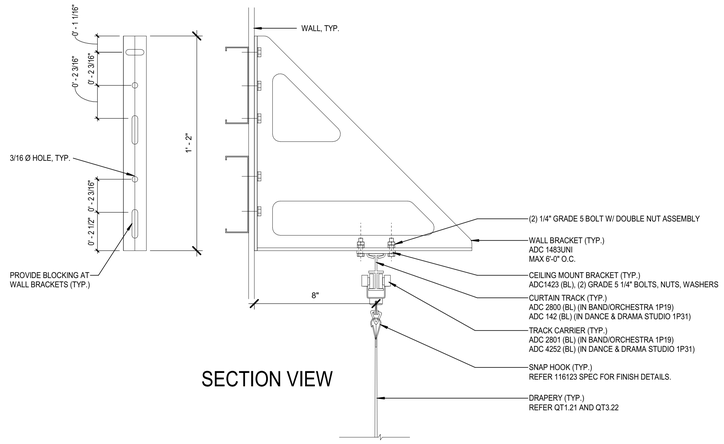


SECTION VIEW

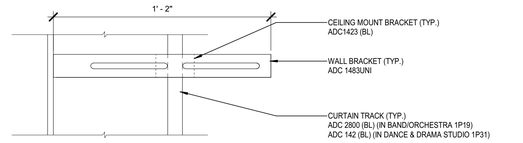


PLAN VIEW

8 QT5.21 TYP. WALL BRACKET - INVERTED
SCALE: 3" = 1'-0"



SECTION VIEW



PLAN VIEW

7 QT5.21 TYP. WALL BRACKET
SCALE: 3" = 1'-0"

DLR GROUP
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THEATRICAL & ACOUSTIC DRAPERY DETAILS

QT5.21