H 2 M architects + engineers
538 Broad Hollow Road, 4th Floor East
Melville, NY 11747 | tel 631.756.8000 | h2m.com

March 20, 2025

To All Bidders:

Re: New 26-100 Fire Headquarters
Thiells-Roseville Fire District
65 W Ramapo Road
Garnerville, NY 10923
All Contracts

ADDENDUM No. 01

Dear Bidders:

Transmitted herewith is **Addendum No. 01** for the above referenced project.

Pursuant to the Instruction for Bidders, Section IB; this Addendum forms a part of the Contract Documents for the above project and modifies the original Bidding Documents dated February 2025. Bidders must acknowledge receipt of the Addendum on the appropriate pages of the proposal sheet(s) when submitting their bid proposal. Failure to acknowledge the Addendum may subject the Bidder to disqualification.

Please note the following additions, clarifications and/or changes included in Addendum No. 01 for the contract listed above. This Addendum is two hundred thirty-four (234) pages in total, including seven (7) pages of the Addendum proper, one (1) page acknowledgement of receipt of this Addendum No. 1, seventy one (71) pages of proposed substitutions, fourteen (14) pages of additions and/or changes to the construction drawings, and one-hundred forty-one (141) pages of additions and/or changes to the Project Manual.

Very truly yours,
H2M architects + engineers,

Patrick O. Stone, RA, LEED AP
Director of Public Safety Market
Assistant Vice President

cc: H2M – DBS
H2M – RLG

X:\TRFD (Thiells Roseville Fire District)\TRFD2302 (New Fire Station)\03-Bid\Addenda\Addendum #1\TRFD2302_Addendum No 01.docx

ADDENDUM No. 01

Drawing Revisions

1. **CS 100 – Dimensional Site Plan**
   - Updated contract coordination, trenching and site concrete by Contract C.
2. **C 110 – Drainage and Utility Plan**
   - Note references removed, D21 designation updated.
3. **NYSDOT 101.01 – NYSDOT Grading and Drainage Improvement Plan**
   - Updated connections to existing drainage at street.
4. **S 002 – General Notes**
   - Special inspection table moved to S 003
5. **S 003 – Special Inspections**
   - Sheet added
6. **S 131 – High Roof Framing Plan**
   - Attachment shown for roof mounted siren.
7. **A 000 – Partition Types**
   - Revised to include clarification on Delegated Design Criteria
8. **A 501 – Section Details**
   - Revised to include clarification on Delegated Design Criteria
9. **A 630 – Curtain Wall Types**
   - Revised to include glazing types.
10. **A 631 – Curtain Wall Types & Details**
    - Revised to include glazing types.
11. **A 640 – Storefront Types**
    - Revised to include glazing types.
12. **ES 100 – Electrical Site Plan**
    - Updated contract coordination, trenching and site concrete by Contract C.
13. **E 502 – Electrical Details**
    - Updated contract coordination, trenching and site concrete by Contract C.
14. **E 540 – Generator Details**
    - Updated contract coordination, trenching and site concrete by Contract C.

Specification Revisions

1. **TOC – Table of Contents**
   - Revised to reflect added and deleted specification sections.
2. **IB – Instructions to Bidders**
   - Fire District name corrected.
3. **Section 095113 – Acoustical Panel Ceilings**
   - Revised to clarify panel ceiling types ACP-2 and ACP-3.
4. **Section 122400 – Window Shades**
   - Revised to clarify window shade locations.
5. **Section 210500 – Common Work Results for Fire Suppression**
   - Add section to project manual.
6. **Section 210529 – Pipe Hangers and Supports for Fire Suppression**
   - Replace section in project manual.
7. **Section 211300 – Sprinkler and Standpipe Piping**
   - Replace section in project manual.
8. **Section 211313 – Sprinkler Systems**

- Replace section in project manual.

9. **Section 212400 – Dry Chemical Extinguishing System**
   - Remove section from project manual, not in scope.
10. **Section 220500 – Common Work Results for Plumbing**
    - Add section to project manual.
11. **Section 220523 – Valves for Plumbing Systems**
    - Replace section in project manual.
12. **Section 220529 – Pipe Hangers and Supports for Plumbing Piping**
    - Replace section in project manual.
13. **Section 220549 – Concrete Pads for Plumbing Equipment**
    - Replace section in project manual.
14. **Section 220553 – Identification for Plumbing Piping and Valves**
    - Replace section in project manual.
15. **Section 220576 – Drainage Accessories**
    - Replace section in project manual.
16. **Section 220577 – Floor and Area Drains**
    - Replace section in project manual.
17. **Section 220700 – Plumbing Piping Insulation**
    - Replace section in project manual.
18. **Section 221100 – Plumbing Piping**
    - Replace section in project manual.
19. **Section 221116 – Vacuum Breakers**
    - Replace section in project manual.
20. **Section 221118 – Backflow Preventers**
    - Replace section in project manual.
21. **Section 221119 – Water Supply Accessories**
    - Replace section in project manual.
22. **Section 221122 – Thermometers and Gauges**
    - Replace section in project manual.
23. **Section 221123 – Pumps for Plumbing Systems**
    - Replace section in project manual.
24. **Section 223301 – Domestic Water Heaters**
    - Replace section in project manual.
25. **Section 224200 – Plumbing Fixtures**
    - Replace section in project manual.
26. **Section 224713 – Drinking Fountains**
    - Replace section in project manual.
27. **Appendix D – Milestone Schedule**
    - Added Milestone Schedule in project manual.

Requests for Information

RFI-1 **Question:** *On drawing M 601.00 schedule shows fan GXF-3 in the fitness room, but it is not shown on drawing M 110.00 or M 131.00. Please advise.*

Response: Refer to fan Location column on schedule. See sheet M 131.00 for fan location on roof.

RFI-2 **Question:** *On drawing M 601.00 schedule shows fan GXF-4 in the first-floor bathrooms, but it is not shown on drawing M 110.00 or M 131.00. Please advise.*

Response: Refer to fan Location column on schedule. See sheet M 131.00 for fan location on roof.

RFI-3 **Question:** *On drawing M 601.00 schedule shows fan GXF-7 for decon bathroom, but it is not shown on drawing M 111.00. Please advise.*

Response: Refer to fan Location column on schedule. See sheet M 110.00 for fan location in Decon Bathroom 113.

RFI-4 **Question:** *On drawing M 601.00 schedule shows fan GXF-6 for kitchen general exhaust in Room 201, but it is not shown on drawing M 111.00 or M 131.00. Please advise.*

Response: Refer to fan Location column on schedule. See sheet M 131.00 for fan location on roof.

RFI-5 **Question:** *Please provide details on the specific licensing needed in Rockland County to perform HVAC work on this project.*

Response: Rockland County requirements can be found here: https://ecode360.com/9667237

RFI-6 **Question:** *Please advise if lockers made by LockersMFG Phenolic Locker Series are an approved substitution as outlined on the Product Substitution request form.*

Response: Proposed phenolic locker system by LockersMFG is an acceptable substitute for the basis of design. It is the Contractor's responsibility to review the basis of design specification and select trim, mounting, accessory, and finish options equivalent to the basis of design specification.

RFI-7 **Question:** *Please advise if the AL13 Plank (Aluminum Extruded Plank) is an approved substitution for Section 074646 – Metal Cladding.*

Response: The proposed AL13 plank system is an acceptable substitution for the basis of design Metal Cladding. Custom Finish Table Walnut. It is the Contractor's responsibility to review the basis of design specification and select trim, mounting, accessory, and finish options equivalent to the basis of design specification.

RFI-8 **Question:** *For the exterior and interior storefront, and curtain walls, it is not specified what type of glass is to be used. Please clarify.*

Response: Drawings A 630, A 631 and A 640 have been revised to include glazing types attached herewith this addendum.

RFI-9 **Question:** *AIA A132-3.3 states substantial completion to be 380 days; Bid Form PB-G-5 states 365 days. Please advise intended project duration.*

Response: Refer to the milestone schedule included herewith this addendum.

RFI-10 **Question:** *Please confirm if the AISC Quality Certification for the fabricator per spec 05 12 00 can be waived for this project and in lieu be in accordance/compliance with AISC standards. This certification will limit the quantity of bidders*

Response: Fabricators without the AISC certification may be acceptable. All QAQC procedures for inspections for shop fabricated elements must be followed in accordance with AISC standards.

RFI-11 **Question:** *Please confirm the project start date and duration for bidding purposes.*

Response: Refer to the milestone schedule included herewith this addendum.

RFI-12 Question: *Please confirm the use of another project management system, AutoDesk, is acceptable to process submittals, RFIs, Change Management, etc. in lieu of the specified Procore in Spec 013300. Or, please confirm if there shall be no cost associated and Palombo can add the GC as a user.*

Response: Procore use will be provided at no additional cost to the Contractors.

RFI-13 Question: *Please confirm if the AWI Quality Certification Program for the fabricator per spec 06 41 16 can be waived for this project and in lieu be in accordance/compliance with AWI standards. This certification will severely limit the quantity of bidders.*

Response: AWI Certification can be waived.

RFI-14 Question: *Please confirm if the AWI Quality Certification Program per spec 08 14 16 can be waived for this project and in lieu be in accordance/compliance with AWI standards. This certification will severely limit the quantity of bidders*

Response: AWI Certification can be waived.

RFI-15 Question: *Please confirm if the ACI certified flatwork technician per spec 03 30 00 can be waived for this project and in lieu be in accordance/compliance with ACI standards. This certification will severely limit the quantity of bidders*

Response: ACI certification may be waived, proper testing, reports, and tickets must be provided for 3rd party inspection.

RFI-16 Question: *Please confirm if the Buy America folding door requirement per spec 10 22 26 can be waived.*

Response: The North American based manufacturer requirements will remain in the specifications. Substitutions can still be considered, manufacturing location should be indicated on the substitution form under “Differences between proposed substitution and specified product”.

RFI-17 Question: *The project manual preface item 17 requires the General Contractor to carry all cost for permits and inspection; However, please confirm the MEP prime contractors are to carry their own costs for permits, fees and inspections for their work, not the GC.*

Response: Each prime contractor is responsible for the permit fees associated with their own work.

RFI-18 Question: *Please advise if bathroom accessories manufactured by Saniflow Corp. are an approved substitution as outlined on the Product Substitution request form.*

Response: Yes, the proposed baby changing station and hand dryer are acceptable substitutions to the basis of design specification. It is the Contractor's responsibility to review the basis of design specification and select trim, mounting, accessory, and finish options equivalent to the basis of design specification.

RFI-19 Question: *ACP – 2: Calla is 1” thick. Also, not available in beveled tegular, only square tegular. ACP – 3: Ceramaguard is only available in square lay-in. Can you please clarify?*

Response: Specification 095113 – Acoustical Panel Ceilings has been revised to clarify edge detail and thicknesses of ACP-2 and ACP-3 and is attached herewith this addendum.

RFI-20 Question: *What is the engineer's estimate or budget for this project?*

Response: Contract G: $9,928,127
Contract P: $1,101,404
Contract M: $1,517,500
Contract E: $2,006,458
Contract C: $2,571,668

RFI-21 Question: *What is the square footage of the new building?*

Response: The gross square footage of the new building is 22,644 SF, refer to table 'Building Code of New York State' on drawing G 010.00.

RFI-22 Question: *Specification 122400 2.03A1a1 notes that all exterior windows and curtain wall M get shades Please confirm that Curtain Wall types G, H, I, J, K are excluded from shades.*

Response: Curtain walls G, H, I, J, and K are excluded from window shades. Curtain wall 'L' shall receive shades. Refer to revised specification 122400 included herewith this addendum.

RFI-23 Question: *Specification 122400 2.03A1a1 notes that all exterior windows and curtain wall M get shades Type M is listed under Storefronts. It includes a glass door with transom. Will either of these get shades?*

Response: Storefront type 'M' shall receive window shades. No other storefront system shall receive window shades. Refer to revised specification 122400 included herewith this addendum.

RFI-24 Question: *Specification 122400 2.03A1a1 notes that all exterior windows and curtain wall M get shades Since M is a storefront, is Curtain wall L what is meant to be getting shades?*

Response: Refer to response for RFI-22 and RFI-23.

RFI-25 Question: *Will any interior windows get shades?*

Response: No interior storefronts shall receive window shades.

RFI-26 Question: *Are there any plans in place to get the operable partition panels to the second floor? Is there a scheduled date for when these panels will be installed?*

Response: This is means and methods, Contract G is responsible for access and sequencing for the operable partition.

RFI-27 Question: *Could you please provide a Construction Schedule, Milestones Schedule, or, at minimum, anticipated Start and Completion dates?*

Response: Refer to the milestone schedule included herewith this addendum.

RFI-28 Question: Will *Generac Industrial be an acceptable substitution for the Nat Gas Generator?*

Response: Please submit a substitution in accordance with Section 263214 2.01 B. Sizing calculations with voltage dips must be provided.

RFI-29 **Question:** We are wondering if there is a specific preference on the model and brand of the oil water separator provided on page PS 102?

Response: As noted on PS 102, Containment Solutions DWT-6 CSI-10 or approved equal.

RFI-30 **Question:** *Per the Contractors Insurance & Bond Requirements specification, it states the GC's performance and payment bond needs to be 125% of contract in lieu of the standard 100% in most public bidding jobs. Please confirm 125% is to be used.*

Response: 125% is to be used.

RFI-31 **Question:** *Spec section 011200 states that the GC contract G shall provide excavation, backfill, etc. for all trench work (foundations, MEPs, etc.) for all contracts under the new building and 5' outside of the building. However, the site contractors will already be mobilized with equipment on site and capable to perform the interior and perimeter trench work, similarly to typical NYS public bid work. This work is typically carried within the site contractors scope of work. Please advise if this can be part of the site contract.*

Response: GC shall provide excavation within the footprint of the building and up to 5ft beyond the foundation walls. It is typical for the GC to maintain responsibility for excavations in this case and the associated coordination.

RFI-32 **Question:** *Please confirm which Prime's responsibility it is to furnish, install, maintain and remove the temporary fence for the construction duration of the project.*

Response: The Sitework Contractor (Contract C) will provide temporary fencing.

RFI-33 **Question:** *Summary of Work for Multiprime spec section 011200 states each prime contractor must self perform 25% of the project. Please confirm this requirement can be removed specifically for the general contract - contract G.*

Response: The prime contractor self perform clause cannot be removed or waived. The 25% self work goal will be reviewed by the Owner and considered for contract award.

RFI-34 **Question:** *There are no sizes listed for Motorized Dampers. Could you please provide the sizes for the Motorized Damper schedule on drawings M-601?*

Response: Motorized damper size should match the size of the respective duct.

RFI-35 **Question:** *Section 133400 Pre Engineered Wood Frame Building is included in the project. Where is this required? The plans do not indicate location or design.*

Response: Refer to sheet A-428 for design intent. Open pre-engineered wood pavilion will be placed across the driveway from the generator and transformer (refer to concrete pad location shown on CS 100 adjacent to SE corner of building)

RFI-36 **Question:** *Section 123100 Manufactured Metal Casework is included in the project manual. 117 Work Indicates that heavy duty cabinets are by the owner. Please confirm if section 123100 must be provided by the general contract*

Response: Manufactured metal casework by Contract G located at Decon Transition 118.

I hereby acknowledge receipt of **ADDENDUM No. 01** to the Bid Documents for the above stated project.

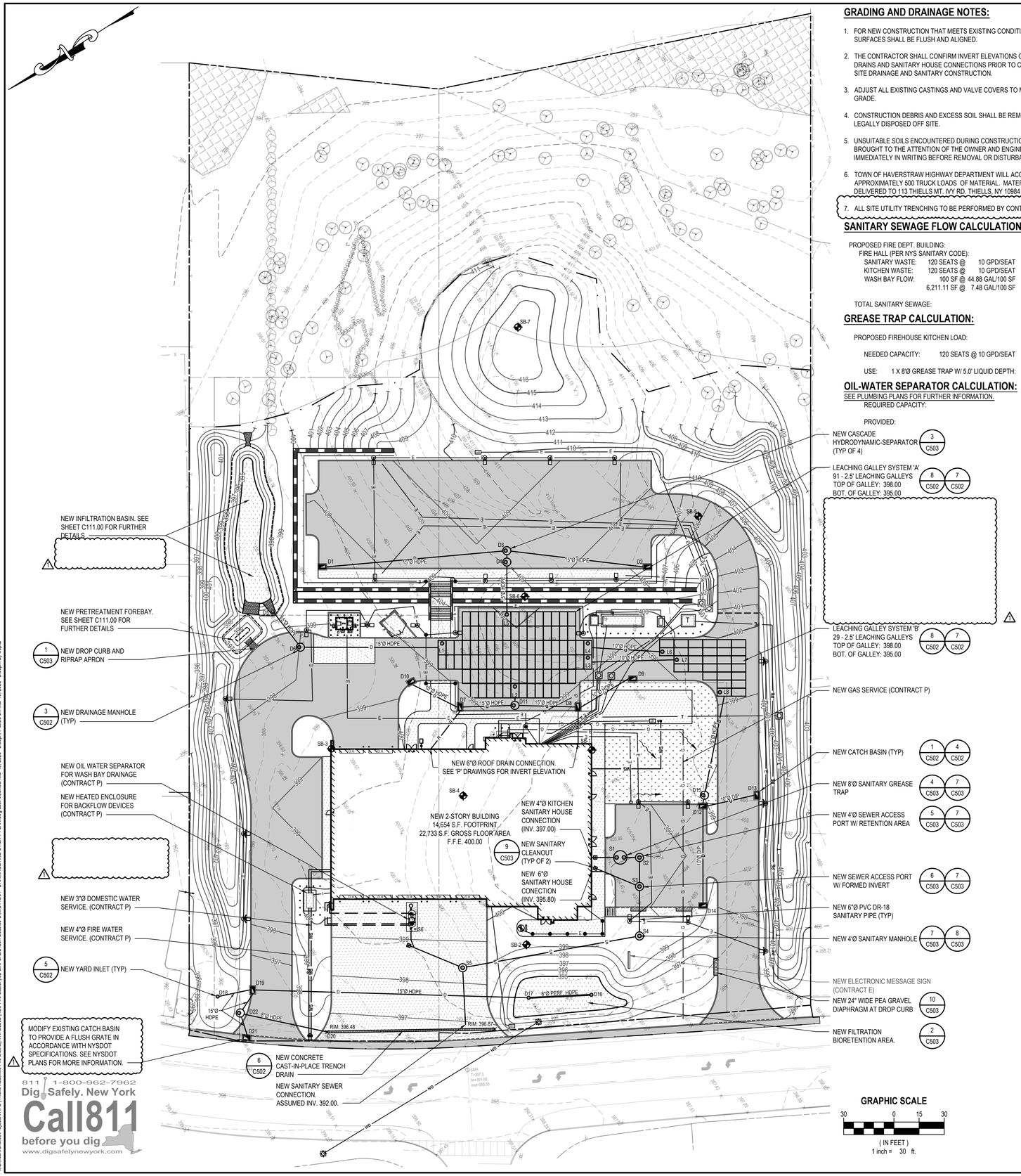
Firm: _____

Address: _____

_____

Authorized Person _____ _____
Signature Date

INSTRUCTIONS: *Return completed Acknowledgment Form electronically to:* ***dsherland@h2m.com***



GRADING AND DRAINAGE NOTES:

1. FOR NEW CONSTRUCTION THAT MEETS EXISTING CONDITIONS, ABUTTING SURFACES SHALL BE FLUSH AND ALIGNED.
2. THE CONTRACTOR SHALL CONFIRM INVERT ELEVATIONS OF ALL ROOF DRAINS AND SANITARY HOUSE CONNECTIONS PRIOR TO COMMENCING SITE DRAINAGE AND SANITARY CONSTRUCTION.
3. ADJUST ALL EXISTING CASTINGS AND VALVE COVERS TO MEET PROPOSED GRADE.
4. CONSTRUCTION DEBRIS AND EXCESS SOIL SHALL BE REMOVED AND LEGALLY DISPOSED OFF SITE.
5. UNSUITABLE SOILS ENCOUNTERED DURING CONSTRUCTION SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER AND ENGINEER IMMEDIATELY IN WRITING BEFORE REMOVAL OR DISTURBANCE.
6. TOWN OF HAVERSTRAW HIGHWAY DEPARTMENT WILL ACCEPT APPROXIMATELY 500 TRUCK LOADS OF MATERIAL. MATERIAL TO BE DELIVERED TO 113 THIELLS MT. IVY RD, THIELLS, NY 10984
7. ALL SITE UTILITY TRENCHING TO BE PERFORMED BY CONTRACT C. 1

SANITARY SEWAGE FLOW CALCULATION:

PROPOSED FIRE DEPT. BUILDING:
FIRE HALL (PER NYS SANITARY CODE):

SANITARY WASTE:	120 SEATS @	10 GPD/SEAT	= 1,200 GPD
KITCHEN WASTE:	120 SEATS @	10 GPD/SEAT	= 1,200 GPD
WASH BAY FLOW:	100 SF @	44.88 GAL/100 SF	= 46 GAL
	6,211.11 SF @	7.48 GAL/100 SF	= 465 GAL
TOTAL SANITARY SEWAGE:			= 2,911 GPD

GREASE TRAP CALCULATION:

PROPOSED FIREHOUSE KITCHEN LOAD:

NEEDED CAPACITY: 120 SEATS @ 10 GPD/SEAT = 1,200 GPD

USE: 1 X 8'Ø GREASE TRAP W/ 5.0' LIQUID DEPTH: = 1,500 GAL

OIL-WATER SEPARATOR CALCULATION:

SEE PLUMBING PLANS FOR FURTHER INFORMATION.

REQUIRED CAPACITY: 511 GAL

PROVIDED: 550 GAL

PIPE MATERIAL SPECIFICATIONS:

DRAINAGE PIPING:

- CATCH BASIN TO LEACHING GALLEY CONNECTIONS: 15"Ø SMOOTH INTERIOR HDPE
- CATCH BASIN TO CATCH BASIN CONNECTIONS: 15"Ø SMOOTH INTERIOR HDPE*
- CATCH BASIN TO DRAINAGE MANHOLE CONNECTIONS: 15"Ø SMOOTH INTERIOR HDPE*
- YARD INLET TO DRAINAGE MANHOLE CONNECTIONS: 15"Ø SMOOTH INTERIOR HDPE
- DRAINAGE MANHOLE TO LEACHING GALLEY CONNECTIONS: 15"Ø SMOOTH INTERIOR HDPE
- LEACHING GALLEY TO LEACHING GALLEY CONNECTIONS: 10"Ø SMOOTH INTERIOR HDPE
- TRENCH DRAIN TO PIPE OUTLET CONNECTIONS: 8"Ø SMOOTH INTERIOR HDPE
- ROOF LEADER TO CATCH BASIN CONNECTIONS: 6"Ø SMOOTH INTERIOR HDPE
- FILTRATION BIO-RETENTION UNDERDRAIN: 6" CORRUGATED PERFORATED HDPE

*UNLESS OTHERWISE NOTED ON PLANS, PROFILES, OR DETAILS

SANITARY PIPING:

- GRAVITY SANITARY HOUSE CONNECTION: 6"Ø PVC (DR 18)*
- GRAVITY SANITARY SEWER COLLECTION SYSTEM: 6"Ø PVC (DR 18)*

*UNLESS OTHERWISE NOTED ON PLANS, PROFILES, OR DETAILS

WATER PIPING

- SEE PLUMBING PLANS

LEGEND

DESCRIPTION	SYMBOL
MAJOR CONTOUR	240
MINOR CONTOUR	241
BORING / TEST HOLE LOCATION	
RIDGE LINE	
RETAINING WALL	
CATCH BASIN	
YARD INLET	
ROOF LEADER	O_L
DRAINAGE CLEAN OUT	
SANITARY GREASE TRAP	
SANITARY CLEAN OUT	
SANITARY MANHOLE	
UTILITY POLE/GUY POLE	
TRAFFIC SIGNAL POLE	
LIGHT POLE	
LIGHTED BOLLARD	
FLOW ARROW	
GAS LINE	G — G
SANITARY LINE	S — S
DRAINAGE LINE	D — D
ELECTRIC LINE	E — E
ROOF LEADER LINE	R — R
FIRE SERVICE LINE	FS — FS
WATER SERVICE LINE	WS — WS
OVERHEAD UTILITIES LINE	OH — OH
LIMIT OF DISTURBANCE LINE	

LEACHING GALLEY STRUCTURE SCHEDULE

SYSTEM ID	PIPE CONNECTION ID	INV. ELEVATION	TOP OF STRUCTURE ELEVATION	BOTTOM OF STRUCTURE ELEVATION	MIN SURFACE ELEVATION
SYSTEM A	L1	NE 396.10 (15")	398.00	395.00	399.00
	L2	NW 395.00 (15")			
	L3	SW 395.00 (10")			
	L4	SW 395.00 (10")			
	L5	SE 395.00 (15")			
SYSTEM B	L6	NE 396.50 (10")	398.00	395.00	399.00
	L7	NE 396.50 (10")			
	L8	NW 395.00 (15")			

NOTE: PROVIDE CASTING TO GRADE AT ALL LEACHING GALLEYS W/ PIPED CONNECTION.

DRAINAGE STRUCTURE SCHEDULE

STRUCT. NUMBER	STRUCTURE TYPE	RIM ELEVATION	INVERT ELEVATIONS
D1	NEW CATCH BASIN	RIM 407.47	SW 404.10 (15")
D2	NEW CATCH BASIN	RIM 407.33	NE 403.95 (15")
D3	NEW CASCADE HDS	RIM 408.70	NW,NE,SW 402.50 (15")
D4	NEW 4'Ø DRAINAGE MANHOLE W/ SOLID COVER	RIM 408.60	SE 402.25 (15") NW 397.50 (15")
D5	NEW YARD INLET	RIM 397.50	W 394.10 (15")
D6	NEW 4'Ø DRAINAGE MANHOLE W/ SOLID COVER	RIM 398.00	SW, E 394.45 (15")
D7	NEW CATCH BASIN	RIM 398.80	NE 395.55 (10") SW 395.55 (15") NW 395.55 (6")
D8	NEW CATCH BASIN	RIM 398.76	NE 395.35 (15") SE 395.35 (10") SW 395.35 (6")
D9	NEW CATCH BASIN	RIM 398.62	NE 395.70 (10")
D10	NEW CATCH BASIN	RIM 398.75	SE 395.85 (15")
D11	NEW CASCADE HDS	RIM 399.25	NE, SE, SW 395.05 (15")
D12	NEW CATCH BASIN	RIM 398.50	SE 395.40 (15") NW, SW 395.40 (10")*
D13	NEW CATCH BASIN	RIM 398.00	NE 395.60 (10")*
D14	NEW CATCH BASIN	RIM 398.50	SE 396.20 (10")*
D15	NEW CASCADE HDS	RIM 399.00	NW, SE 395.35 (15")
D16	NEW YARD INLET	RIM 396.00**	NE 391.70 (6")***
D17	NEW YARD INLET	RIM 396.00**	SW 391.70 (6")*** NE 391.70 (15")
D18	NEW YARD INLET	RIM 395.50	SW 392.10 (15")
D19	NEW CATCH BASIN	RIM 396.15	NE 391.70 (15") NW 392.75 (15") SW 390.00 (15")
D20	NEW TRENCH DRAIN	SEE PLAN	NE 393.75 (8")
D21	EXISTING NYSDOT CATCH BASIN	RIM 396.40	NE 391.55 (EXIST.) S 391.55 (15")
D22	NEW CASCADE HDS	RIM 396.30	N, S 392.65 (15")

(*) DENOTES DUCTILE IRON PIPE SHALL BE USED
(**) DENOTES RIM IS HIGHER THAN FINISHED GRADE
(***) DENOTES PERFORATED UNDERDRAIN PIPE SHALL BE USED

SANITARY STRUCTURE SCHEDULE — SEWER PIPE SHALL BE 6"Ø DR 18 PVC UNLESS OTHERWISE NOTED

STRUCT NUMBER	STRUCTURE TYPE	RIM ELEVATION	TOP ELEVATION	BOTTOM ELEVATION	EFFECTIVE DEPTH	INVERT IN	INVERT OUT
S1	8' DIA. GREASE TRAP	RIM 399.35	397.15	390.90	5'	396.40 (4")	395.90 (6")
S2	4' DIA. SEWER ACCESS PORT W/ RETENTION AREA	RIM 399.25	--	--	----------	395.8 (6")	395.70 (6")
S3	4' DIA. SEWER ACCESS PORT W/ FORMED INVERT	RIM 399.20	--	--	----------	395.20 (6")	395.10 (6")
S4	4' DIA. SANITARY MANHOLE	RIM 399.34	--	--	----------	394.70 (6")	394.60 (6")
S5	4' DIA. SANITARY MANHOLE	RIM 398.36	--	--	----------	393.10 (6")	393.00 (6")
S6	550-GAL OIL WATER SEPARATOR	VARIES	--	--	----------	NOTE 1	396.65 (4")

NOTES:
1. SEE PLUMBING PLANS.

H2M architects + engineers
538 Broad Hollow Road, 4th Floor East
Melville, NY 11747
631.756.8000 • www.h2m.com
NY Architecture & Landscape Architecture: No Certificate Required
NY Engineering Certificate of Authorization No. 0018178

CONSULTANTS:

MARK	DATE	DESCRIPTION
1	03/19/2025	BID ADDENDUM No. 1

STATE OF NEW YORK — DANIELLE A. DRAKE — 092596 — LICENSED PROFESSIONAL ENGINEER

08/31/2027
LICENSE EXPIRATION DATE

DANIELLE A. DRAKE, P.E.
NY PROFESSIONAL ENGINEER Lic. No. 092596

"IN ACCORDANCE WITH ARTICLE 145, SECTION 7209 OF THE NYS EDUCATION LAW, ALTERATION OF THIS DOCUMENT EXCEPT BY LICENSE PROFESSIONAL IS ILLEGAL."

DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
WHS	WHS	DAD	MRM

PROJECT No.:	DATE:	SCALE:
TRFD 2302	FEBRUARY 2025	AS SHOWN

CLIENT

THIELLS ROSEVILLE FIRE DISTRICT

NEW 26-100 FIRE HEADQUARTERS

THIELLS 26 FD

65 W RAMAPO RD GARNERVILLE, NY 10923

CONTRACT

CONTRACT C CIVIL CONSTRUCTION

STATUS

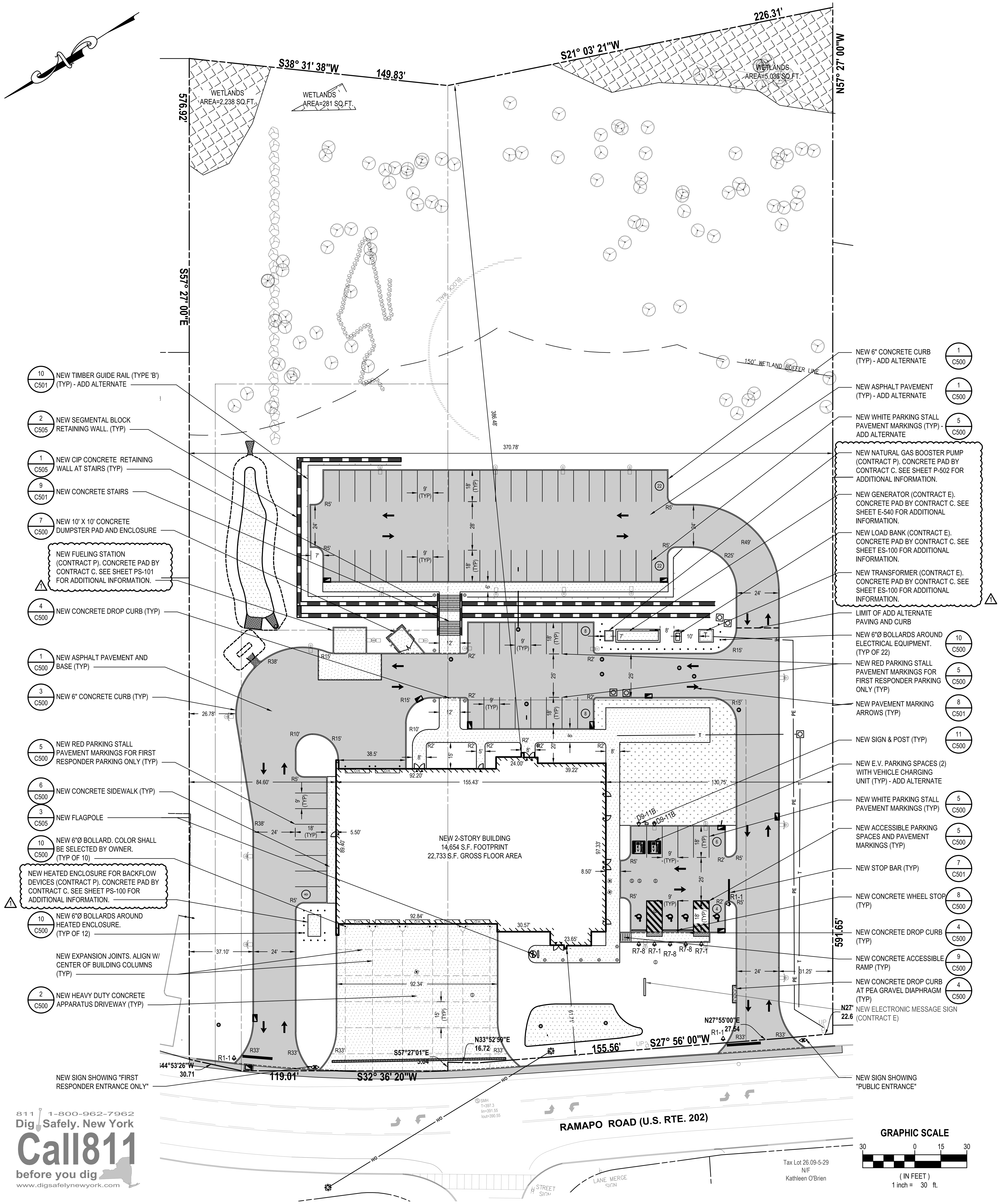
FINAL BID DOCUMENT

SHEET TITLE

DRAINAGE & UTILITY PLAN

DRAWING No.

C 110.01



SIGN LEGEND

DESCRIPTION		SYMBOL
R1-1	(24" x 24")	STOP
R7-8	(12x18)	RESERVED PARKING
R7-1	(12"x18")	NO PARKING ANY TIME
D9-11B	(24"x24")	EV
	(18"x36")	FIRST RESPONDER ENTRANCE ONLY
	(18"x36")	PUBLIC ENTRANCE

LEGEND

DESCRIPTION / SYMBOL

- CURB
- RETAINING WALL
- CONCRETE DROP CURB
- ASPHALT PAVEMENT
- CONCRETE PAVEMENT SIDEWALK
- OUTDOOR WELLNESS AREA
- FLAGGED WETLAND AREA
- SIGN
- DOOR
- OVERHEAD DOOR (OH)
- UTILITY MANHOLE (S D E T U)
- CLEAN OUT
- CATCH BASIN
- YARD INLET
- BOLLARD
- PARKING STALL COUNT (12)
- LIGHT POLE
- LIGHTED BOLLARD
- TRAFFIC SIGNAL POLE
- OVERHEAD UTILITIES LINE (O/H)
- TIMBER GUIDE RAIL

SITE DATA

RCTM: 26.09-4-11,12,13,14,15
ZONE: R15 - MEDIUM DENSITY RESIDENCE DISTRICT / ROUTE 202 FLOATING OVERLAY DISTRICT
PROPOSED USE: FIRE STATION
SITE AREA: 213,918 SF / 4.91 ACRES

BULK REQUIREMENTS (ROUTE 202 FLOATING OVERLAY ZONE)

ITEM	REQUIRED	NEW
MINIMUM LOT AREA	1.00 ACRES	4.91 ACRES
MINIMUM LOT WIDTH	150.00 FT	370.78 FT
MINIMUM LOT FRONTAGE	150.00 FT	377.22 FT
MINIMUM FRONT YARD DEPTH	25.00 FT	61.71 FT
MINIMUM SIDE YARD WIDTH	20.00 FT	84.60 FT
MINIMUM TOTAL SIDE YARD	40.00 FT	215.35 FT
MINIMUM REAR YARD DEPTH	40.00 FT	386.48 FT
MAXIMUM BUILDING HEIGHT	28 FT / 2 STORIES	28 FT / 2 STORIES
MAXIMUM F.A.R.	0.35	0.11
MAXIMUM BUILDING COVERAGE	20%	7%
MAXIMUM TOTAL LOT COVERAGE	60%	36%
MINIMUM LANDSCAPED AREA	15%	64%
MINIMUM BUFFER ZONE WIDTH	20.00 FT	26.78 FT

PARKING CALCULATIONS

REQUIRED PARKING:
NEW FIRE STATION:
OFFICE & PUBLIC BUILDING: 22,733 SF @ 1 SPACE / 150 SF = 152 SPACES
TOTAL REQUIRED PARKING: 152 SPACES

PARKING PROVIDED:
FIRST RESPONDER PARKING: 24 SPACES
PUBLIC PARKING: 54 SPACES
TOTAL SPACES PROVIDED: 78 SPACES*

*INCLUDING 4 ACCESSIBLE SPACES

SITE PLAN NOTES:

1. INSPECT THE SITE PRIOR TO SUBMISSION OF BIDS AND MAKE NO ADDITIONAL CLAIMS REGARDING SITE CONDITIONS THEREAFTER.
2. NOTIFY THE OWNER AND H2M (TELEPHONE 631-756-8000) AT LEAST 48 HOURS PRIOR TO THE COMMENCEMENT OF THE WORK. THE SAME NOTICE SHALL BE REQUIRED WHEN RESUMING WORK AFTER ANY STOPPAGE OR DELAY.
3. COMPLETE ALL SURVEY AND STAKEOUT AS REQUIRED TO PROPERLY COMPLETE THE WORK.
4. PERFORM DAILY CLEANUP OPERATIONS INCLUDING REMOVAL OF DEBRIS AND EXCESS CONSTRUCTION MATERIAL, AND DRIVEWAY/STREET CLEANING TO THE SATISFACTION OF THE OWNER.
5. DURING ALL NON-WORKING HOURS, STORE ALL EQUIPMENT AND MATERIALS WITHIN AN AREA DESIGNATED BY THE OWNER AT THE PROJECT SITE.
6. ALL CURB DIMENSIONS SHOWN REFER TO THE FACE OF CURB.
7. ALL CONSTRUCTION TO CONFORM WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL CODE REQUIREMENTS.
8. COORDINATE CONSTRUCTION ACTIVITIES WITH OWNER TO MINIMIZE INTERRUPTION TO THE OWNER'S OPERATIONS.
9. RESTORE SURROUNDING AREAS DAMAGED OR DISTURBED DURING CONSTRUCTION. RESTORE TO NEW CONDITIONS AT NO ADDITIONAL COST TO THE OWNER.
10. RESTORE ALL DISTURBED GRASS AREAS AND ALL AREAS NOT SPECIFICALLY IDENTIFIED FOR OTHER IMPROVEMENTS WITH 4 INCHES OF TOPSOIL AND SEED.
11. REMOVE ALL ASPHALT FROM EXISTING CASTINGS.
12. SEAL ALL JOINTS BETWEEN NEW ASPHALT AND EXISTING ASPHALT WITH HOT ASPHALT CEMENT.
13. ARCHITECTURAL AND STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH THE CIVIL DRAWINGS FOR THE LAYOUT AND CONSTRUCTION OF BUILDING FOUNDATIONS AND OTHER BUILDING ELEMENTS. REPORT ANY DISCREPANCIES BETWEEN CIVIL, ARCHITECTURAL, AND STRUCTURAL DRAWINGS IN WRITING TO THE CIVIL ENGINEER PRIOR TO CONSTRUCTING BUILDING FOUNDATIONS AND/OR OTHER BUILDING ELEMENTS.

H2M architects + engineers
538 Broad Hollow Road, 4th Floor East
Melville, NY 11747
631.756.8000 • www.h2m.com
NY Architecture & Landscape Architecture: No Certificate Required
NY Engineering Certificate of Authorization No. 0018178

CONSULTANTS:

MARK	DATE	DESCRIPTION
1	03/19/2025	BID ADDENDUM No. 1

DANIELLE A. DRAKE, P.E.
NY PROFESSIONAL ENGINEER Lic. No. 092596

DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
WHS	WHS	DAD	MRM

PROJECT No.:	DATE:	SCALE:
TRFD 2302	FEBRUARY 2025	AS SHOWN

CLIENT
THIELLS ROSEVILLE FIRE DISTRICT

NEW 26-100 FIRE HEADQUARTERS

THIELLS 26 FD

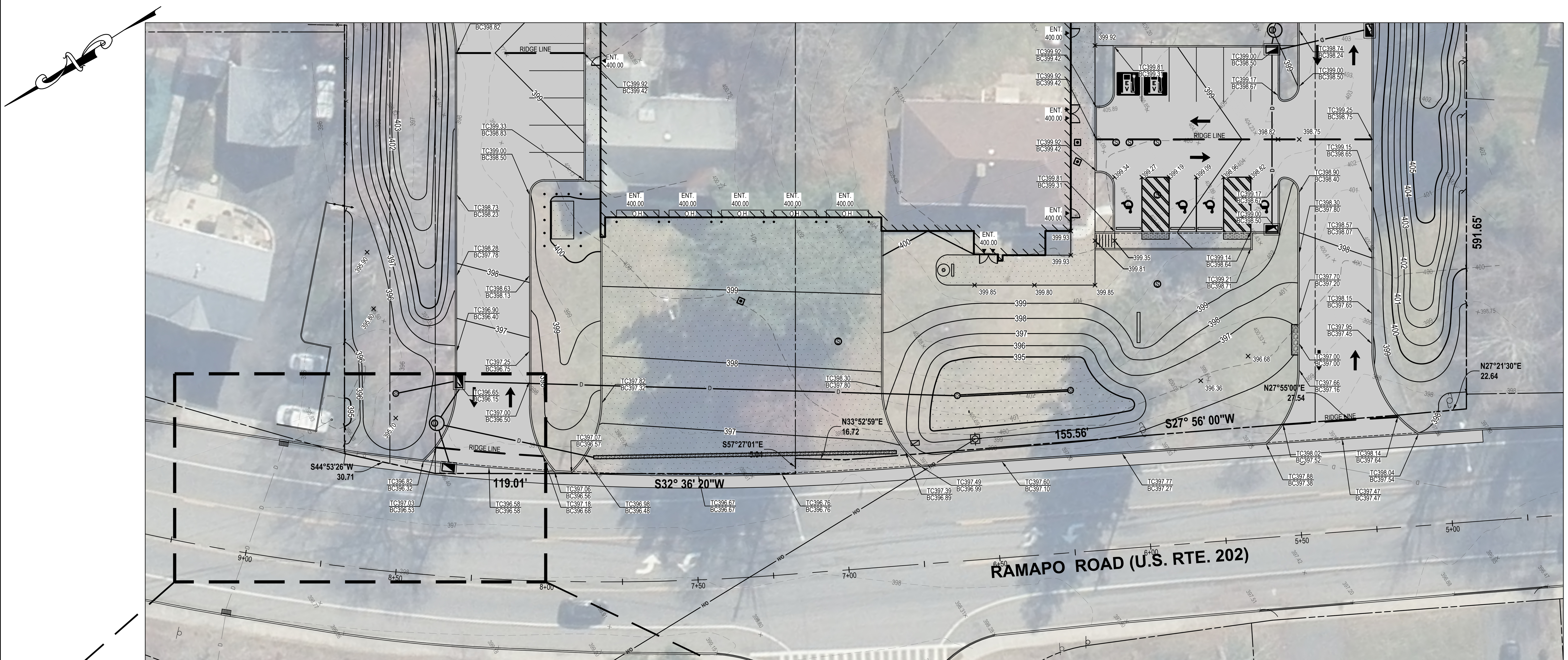
65 W RAMAPO RD
GARNERVILLE, NY 10923

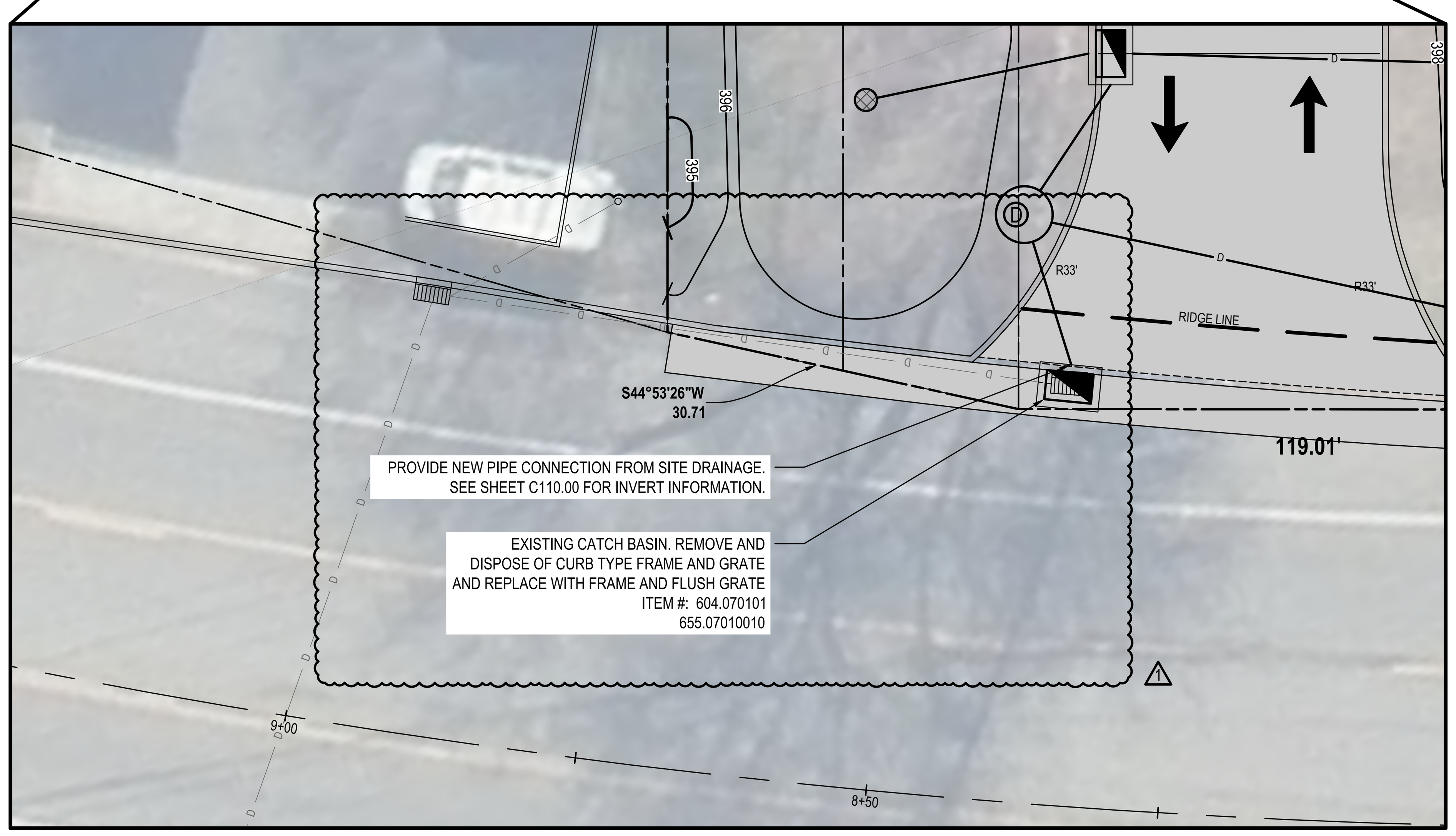
CONTRACT
CONTRACT C
CIVIL CONSTRUCTION

STATUS
FINAL BID DOCUMENT

SHEET TITLE
DIMENSIONAL SITE PLAN

DRAWING No.
CS 100.01





Drainage Improvement Inset
SCALE: 1" = 10'-0"

GRAPHIC SCALE
30 0 15 30
(IN FEET)
1 inch = 30 ft.

PLAN NOTES:

1. EXISTING SURVEY PREPARED BY ATZL, NASHER & ZIGLER P.C. DATED 12/19/2023.
2. VERIFY LOCATION AND INVERTS FOR ALL STRUCTURES PRIOR TO COMMENCEMENT OF CONSTRUCTION.
3. ALL NEW PAVEMENT SHALL MEET EXISTING GRADE AT EDGE OF EXISTING PAVEMENT.
4. ALL NEW CURBS SHALL MEET EXISTING GRADE OF ADJACENT CURB.
5. ALL WORK IN THE NYSDOT RIOGHT-OF-WAY SHALL BE DONE IN ACCORDANCE WITH ALL NYSDOT REQUIREMENTS AND IN ACCORDANCE WITH THE PERMIT DOCUMENTS.

811 1-800-962-7962
Dig Safely. New York
Call811
before you dig
www.digsafelynewyork.com

H2M architects + engineers
538 Broad Hollow Road, 4th Floor East
Melville, NY 11747
631.756.8000 • www.h2m.com
NY Architecture & Landscape Architecture: No Certificate Required
NY Engineering Certificate of Authorization No. 0018178

MARK	DATE	DESCRIPTION
1	03/19/2025	BID ADDENDUM No. 1

STATE OF NEW YORK · DANIELLE A. DRAKE · 092596 · LICENSED PROFESSIONAL ENGINEER

DANIELLE A. DRAKE, P.E.
NY PROFESSIONAL ENGINEER Lic. No. 092596
08/31/2027 EXP. DATE
"IN ACCORDANCE WITH ARTICLE 145, SECTION 7209 OF THE NYS EDUCATION LAW, ALTERATION OF THIS DOCUMENT EXCEPT BY LICENSE PROFESSIONAL IS ILLEGAL"

DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
WHS	WHS	DAD	DAD

PROJECT No.:	DATE:	SCALE:
TRFD 2302	FEBRUARY 2025	AS SHOWN

CLIENT

THIELLS ROSEVILLE FIRE DISTRICT

NEW 26-100 FIRE HEADQUARTERS

THIELLS 26 FD

65 W RAMAPO RD
GARNERVILLE, NY 10923

CONTRACT

STATUS
REGULATORY REVIEW

SHEET TITLE
NYSDOT GRADING & DRAINAGE IMPROVEMENT PLAN

DRAWING No.
DOT 101.01

MASONRY NOTES:

1. CONSTRUCT MASONRY IN ACCORDANCE WITH THE AMERICAN CONCRETE INSTITUTE ACI-530 / ASCE 5 / TMS 402, LATEST EDITION "BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES."
2. PROVIDE CONCRETE MASONRY UNITS (CMU) CONFORMING TO ASTM C90 GRADE N, WITH A MINIMUM NET COMPRESSIVE STRENGTH (F'M) OF 2,000 PSI. MASONRY STRENGTH SHALL BE DETERMINED BY THE UNIT STRENGTH METHOD OR THE PRISM TEST METHOD AS DESCRIBED BY ACI 530.
3. PROVIDE MORTAR CONFORMING TO THE REQUIREMENTS OF ASTM C-270, TYPE S (OR AS APPLICABLE). CEMENT USED FOR MORTAR SHALL BE PORTLAND CEMENT WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 750 PSI.
4. PROVIDE GROUT CONFORMING TO THE REQUIREMENTS OF ASTM C476 COARSE GROUT, WITH A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS.
5. PROVIDE REINFORCING BARS CONFORMING TO ASTM A615, GRADE 60. ALL WELDED REINFORCING SHALL BE ASTM A706. PROVIDE SPACERS AND TIES AS NEEDED TO PROPERLY SECURE REINFORCING PRIOR TO GROUTING. ALL CELLS WITH REINFORCING SHALL BE FULLY GROUTED.
6. MASONRY SHALL COMPLY WITH THE TYPICAL DETAILS FOR CONCRETE MASONRY WALL REINFORCING AND CONCRETE MASONRY OPENING REINFORCING AS SHOWN IN THE STRUCTURAL DRAWINGS.
7. SPECIAL INSPECTION IS REQUIRED ON ALL MASONRY WALLS, IN ACCORDANCE WITH BUILDING CODE REFERENCED ABOVE.
8. LAP REINFORCING IN ACCORDANCE WITH ACI 530, UNLESS INDICATED OTHERWISE IN STRUCTURAL DRAWINGS.
9. MORTARED CELLS SHALL BE PLACED CONTINUOUSLY AT THE ELEVATION OF CONSTRUCTION AND SHALL NOT BE PERMITTED TO BE PUMPED OR PLACED FROM ABOVE. GROUTING OF THE MASONRY CELLS SHALL BE PERMITTED IN THE INSTANCES WHERE CONTINUOUS MORTAR PLACEMENT CANNOT BE ACHIEVED.
10. MAXIMUM HEIGHT TO WHICH MASONRY SHALL BE LAID BEFORE GROUTING IS 5 FEET. MAXIMUM GROUT PLACEMENT HEIGHT IS 5 FEET. IF GROUT PLACEMENT HEIGHT EXCEEDS 5 FEET, PROVIDE CLEANOUT OPENINGS AT THE BOTTOM OF EACH PLACEMENT. CLEANOUT OPENINGS SHALL BE PROVIDED AT EACH CELL TO BE FILLED WITH GROUT.
11. REINFORCE MASONRY WHERE SHOWN ON STRUCTURAL DRAWINGS. TIE REINFORCING IN POSITION AND PLACE GROUT AROUND REINFORCING. DO NOT PUSH REINFORCING DOWN INTO PREVIOUSLY PLACED GROUT FILL. SET ANCHOR BOLTS SIMILARLY.
12. HORIZONTAL JOINT REINFORCEMENT SHALL NOT EXTEND THROUGH EXPANSION JOINTS IN THE MASONRY. JOINT REINFORCEMENT SHALL BE PLACED CONTINUOUSLY WITH THE ENDS LAPPED 6" FOR DEFORMED BARS AND 12" FOR SMOOTH BARS.
13. TIE MASONRY WYTHES TOGETHER WITH HORIZONTAL REINFORCING AS SPECIFIED.
14. PROVIDE VERTICAL BARS, SIZE AND SPACING MATCHING WALL REINFORCING, AT ALL CORNERS, ENDS OF WALLS, EACH SIDE OF CONTROL JOINTS, AND EACH SIDE OF WALL OPENINGS. SEE ARCHITECTURAL DRAWINGS FOR LOCATIONS OF CONTROL JOINTS.
15. ALL CORNERS AND INTERSECTIONS OF STRUCTURAL MASONRY WALLS SHALL BE CONSTRUCTED BY INTERLOCKING COURSE.
16. ALL LINTELS SHALL BEAR 8" MINIMUM EACH SIDE OF OPENING ON SOLID GROUTED CELLS, UNLESS NOTED OTHERWISE.
17. VERTICAL BARS INTERRUPTED BY STEEL FRAMING SHALL BE WELDED TO TOP OF STEEL FRAMING, OR FASTENED TO TOP OF STEEL WITH REBAR COUPLERS WELDED TO TOP OF STEEL.
18. MORTAR BED JOINTS SHALL NOT EXCEED 3/8" THICKNESS, OR AS SPECIFIED IN EXPOSED AREAS WITH TIGHTER BED JOINT TOLERANCE.
19. COORDINATE PLACEMENT OF VERTICAL WALL DOWELS EMBEDDED INTO FOUNDATIONS AND FLOOR SLABS WITH CELLS OF MASONRY WALL. DOWEL SIZE AND SPACING TO MATCH VERTICAL WALL REINFORCING, U.O.N.
20. REFER TO ARCHITECTURAL DRAWINGS FOR NON-STRUCTURAL MASONRY PARTITION WALL CONSTRUCTION..

METAL DECK NOTES:

1. DESIGN, FABRICATE, AND ERECT METAL DECK IN CONFORMANCE WITH THE STEEL DECK INSTITUTE (SDI) "CODE OF RECOMMENDED STANDARD PRACTICE AND BASIC DESIGN SPECIFICATIONS".
2. FORM ROOF AND FLOOR DECK FROM STEEL SHEETS CONFORMING TO ASTM A611 GRADE C AND D OR A653 OR HIGHER SPECIFICATIONS WITH A MINIMUM YIELD STRENGTH OF 33 KSI.
3. METAL DECK PANELS ARE TO BE 3-SPAN CONTINUOUS, UNLESS OTHERWISE NOTED.
4. PROVIDE SHORING FOR METAL DECK IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS INDICATED METAL DECK ERECTION DRAWINGS.
5. ATTACH METAL DECK TO STEEL SUPPORT MEMBERS AS INDICATED AND IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION. WHEN DECK IS SCHEDULED TO BE EXPOSED, DE-SLAG, CLEAN, AND TOUCH UP WELDS WITH ZINC-RICH PRIMER.
6. LAP METAL DECK ENDS MINIMUM OF 2 INCHES.
7. WHEN FASTENING DECK TO SUPPORT MEMBERS WITH WELDS, PROVIDE WELDING MATERIALS INSTALLATION PROCEDURES TO PREVENT BURNING OF HOLES IN DECK. PROVIDE WELD WASHERS WHERE REQUIRED.
8. PROVIDE CLOSURE STRIP WHERE CHANGES IN DECK DIRECTION OCCUR. CLOSURE TO BE SAME DEPTH AND GAUGE AS DECK.
9. AT ENDS OF DECKS OR WHERE CHANGES OF DECK DIRECTION OCCUR, FASTEN DECK TO SUPPORTS AT EACH FLUTE. FASTEN SIDES OF DECK TO CLOSURES OR SUPPORTING MEMBERS PER SIDELAP FASTENING REQUIREMENTS.
10. WHERE PARTIAL PANELS MAY BE REQUIRED TO COMPLETE DECK INSTALLATION AT PERIMETER OF STRUCTURE, FASTEN DECK TO SUPPORTING STRUCTURAL MEMBERS AT EACH FLUTE. INSTALL PARTIAL DECK PIECES IN THREE CONTINUOUS SPAN LENGTHS.
11. AT PERIMETER OF DECK, SECURE DECK TO STRUCTURAL MEMBERS WITH SAME ATTACHMENT AND SPACING SUPPORT ATTACHMENT AS INDICATED ON PLANS.
12. DECK SUPPLIER IS RESPONSIBLE FOR PROVIDING CLOSURES AND POUR STOPS AT ALL TERMINATIONS OR CHANGES IN DIRECTION OF METAL DECK. ALL DECKING ACCESSORIES SHALL BE INCLUDED IN METAL DECK SHOP DRAWINGS FOR REVIEW AND APPROVAL.

COLD-FORMED STEEL NOTES:

1. COLD-FORMED STEEL FRAMING SHALL BE DESIGNED, FABRICATED, AND ERECTED IN ACCORDANCE WITH THE AMERICAN IRON AND STEEL INSTITUTE (AISI) "SPECIFICATIONS FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS", LATEST EDITION.
2. PROVIDE ALL STUDS AND/OR JOISTS AND ACCESSORIES OF THE TYPE, SIZE, GAUGE, AND SPACING SHOWN ON THE DRAWINGS.
3. FORM ALL FRAMING MEMBERS AND ACCESSORIES FROM CORROSION RESISTANT STEEL, CORRESPONDING TO REQUIREMENTS OF ASTM A653 AND THE FOLLOWING STRENGTH REQUIREMENTS:
   A. MATERIAL WITH A THICKNESS OF 18 GA (43 MIL) OR THINNER SHALL HAVE MINIMUM YIELD STRENGTH OF 33 KSI.
   B. MATERIAL WITH A THICKNESS OF 16 GA (54 MIL) OR THICKER SHALL HAVE A MINIMUM YIELD STRENGTH OF 50 KSI.
4. PLACE ALL COLD-FORMED STEEL STUD WALL BRIDGING HORIZONTALLY WITH A MAXIMUM VERTICAL SPACING OF FOUR FEET, UNLESS NOTED OTHERWISE. AS AN OPTION, CONTINUOUS COLD-FORMED CHANNELS MAY BE POSITIONED THROUGH THE STUD PUNCH OUTS AS BRIDGING PROVIDED THE BRIDGING CHANNEL IS PROPERLY FASTENED TO EACH STUD. STUDS WITH A MEMBER DEPTH OF EIGHT (8) INCHES OR GREATER SHALL USE CONTINUOUS FLAT STRAP BRIDGING ON EACH SIDE OF THE WALL.
5. BRIDGING SHALL BE SECURELY ANCHORED TO A POST, STRONGBACK, BRACE, OR OTHER SUPPORTING MEMBER PER WALL DESIGN, OR NOT FARTHER THAN EVERY 24 FEET ON CENTER.
6. INSTALL AXIALLY LOADED STUDS IN A MANNER WHICH WILL ASSURE THAT THEIR ENDS ARE POSITIONED AGAINST THE INSIDE OF THE TRACK WEB PRIOR TO FASTENING.
7. FASTEN COMPONENTS WITH SELF-DRILLING SCREWS OR WELDING. PROVIDE SCREWS OF SUFFICIENT SIZE TO ENSURE THE STRENGTH OF THE CONNECTION. WIRE TYING OF COMPONENTS IS NOT PERMITTED. TOUCH UP ALL WELDS WITH A ZINC-RICH PAINT.
8. WELDING OF COLD-FORMED STUDS MAY BE PERFORMED USING A MINIMUM ONE-EIGHTH INCH AWS TYPE 6013 WELDING ROD.
9. SECURELY ANCHOR WALL TRACKS TO THE SUPPORTING STRUCTURE. PROVIDE COMPLETE, UNIFORM, AND LEVEL BEARING SUPPORT FOR THE BOTTOM TRACK. PROVIDE METAL OR PLASTIC SHIMS BETWEEN BOTTOM TRACK AND SLAB AT EACH WALL STUD AS NEEDED TO ENSURE FULL BEARING.
10. SECURELY ANCHOR ABUTTING LENGTHS OF WALL TRACK TO A COMMON STRUCTURAL ELEMENT, BUTT-WELDED OR SPLICED.
11. PLUMB, ALIGN, AND SECURELY ATTACH STUDS TO THE FLANGES OF BOTH UPPER AND LOWER WALL TRACKS. SPLICES IN WALL STUDS ARE NOT PERMITTED.
12. ALIGN PUNCHED OPENINGS OF WALL STUDS.
13. PROVIDE HEADERS AND SUPPORTING STUDS FOR FRAMING OF WALL OPENINGS.
14. STUD MATERIAL USED IN HEADER CONSTRUCTION SHALL BE FREE OF PUNCHED OPENINGS.
15. WHERE COLD-FORMED STEEL DESIGN HAS BEEN DELEGATED, OWNER/CONTRACTOR SHALL HIRE A SPECIALTY ENGINEER WITH EXPERIENCE IN COLD-FORMED STEEL DESIGN TO DEVELOP THE DESIGN OF THE DELEGATED COLD-FORMED STEEL MEMBERS. SPECIALTY ENGINEER RESPONSIBLE FOR COLD-FORMED STEEL DESIGN SHALL BE A LICENSED PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF THE PROPOSED CONSTRUCTION. SPECIALTY ENGINEER SHALL PROVIDE A FULL SET OF COLD-FORMED STEEL ENGINEERING DRAWINGS TO THE ENGINEER OF RECORD FOR REVIEW AND APPROVAL. WHERE DELEGATED COLD-FORMED STEEL DESIGN INCLUDES BEARING WALLS, SHEAR WALLS, BRACED WALL PANELS, OR OTHER VERTICAL ELEMENTS OF THE BUILDING GRAVITY OR LATERAL SYSTEMS, DESIGN CALCULATIONS SHALL ALSO BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW AND APPROVAL. ALL ENGINEERING DRAWINGS AND CALCULATIONS SUBMITTED SHALL BE SIGNED AND SEALED BY THE SPECIALTY ENGINEER RESPONSIBLE FOR THE COLD-FORMED STEEL DESIGN.
16. SHOP DRAWINGS SHALL BE SUBMITTED FOR ALL PANELIZED COLD-FORM STEEL CONSTRUCTION FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.
17. FOR ANY JAMB MEMBER THAT CANNOT BE SIZED AS SPECIFIED IN THE ARCHITECTURAL DRAWINGS, THE CONTRACTOR SHALL SUBSTITUTE IT WITH AN HSS STEEL POST. THE HSS STEEL POST SHALL BE DESIGNED, PROCURED, AND INSTALLED BY THE CONTRACTOR

CURTAIN WALL SYSTEM NOTES:

1. CURTAIN WALL SYSTEM SHALL BE DESIGNED TO MEET THE MOST STRINGENT MINIMUM LOADING AND SERVICEABILITY REQUIREMENTS SPECIFIED IN DESIGN NOTES HEREIN AS WELL AS INDICATED IN SPECIFICATION SECTION. CURTAIN WALL SYSTEM MUST BE DESIGNED AS A DEAD LOADED SYSTEM BEARING ON FOUNDATIONS OR STEEL BEAMS WHERE SPECIFICALLY NOTED IN PLANS. NO COMPONENTS OF THE SYSTEM SHALL BE HUNG FROM STEEL SUPPORTS ABOVE UNLESS SPECIFICALLY INDICATED IN PLANS. MANUFACTURER SUPPLIED CLIPS SHALL BE PROVIDED BY GC FOR LATERAL ATTACHMENT TO STRUCTURE.

NOTE: SEE S 003 FOR SPECIAL INSPECTION REQUIREMENTS.

1

LIST OF ABBREVIATIONS:

C/C	=	CENTER-TO-CENTER
C.J.	=	CONTROL JOINT; CEILING JOISTS
D.E.	=	DECK EDGE
E.F.	=	EACH FACE
E.J.	=	EXPANSION JOINT
E.W.	=	EACH WAY
E.O.D.	=	EDGE OF DECK
E.O.S.	=	EDGE OF SLAB
I.F.	=	INSIDE FACE
O.C.	=	ON CENTER
O.F.	=	OUTSIDE FACE
O.H.	=	OVERHEAD
R.R.	=	ROOF RAFTERS
S.O.G.	=	SLAB-ON-GRADE
T.O.D.	=	TOP OF DECK
T.O.F.	=	TOP OF FOOTING
T.O.P.	=	TOP OF PIER/PEDESTAL
T.O.S.	=	TOP OF SLAB; TOP OF STEEL
T.O.Sh.	=	TOP OF SHELF
T.O.W.	=	TOP OF WALL
TYP.	=	TYPICAL
U.O.N.	=	UNLESS OTHERWISE NOTED
W.P.	=	WORKING POINT

H2M architects + engineers
538 Broad Hollow Road, 4th Floor East
Melville, NY 11747
631.756.8000 • www.h2m.com
NY Architecture & Landscape Architecture: No Certificate Required
NY Engineering Certificate of Authorization No.: 0018178

CONSULTANTS:

MARK	DATE	DESCRIPTION
1	03/19/2025	BID ADDENDUM #1

STATE OF NEW YORK · DANIEL J. AIELLO · LICENSED PROFESSIONAL ENGINEER · 100515

04/30/2027
Exp. Date

DANIEL J. AIELLO, P.E.
NY PROFESSIONAL ENGINEER/Lic. No. 100515

DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
JJN	SRK	JJN	DJA

PROJECT No:	DATE:	SCALE:
TRFD 2302	MARCH 2025	AS SHOWN

CLIENT

THIELLS ROSEVILLE FIRE DISTRICT

NEW 26-100 FIRE HEADQUARTERS

65 W RAMAPO ROAD GARNERVILLE, NY 10923

CONTRACT

CONTRACT G

STATUS

BID ADDENDUM NO.1

SHEET TITLE

GENERAL NOTES

DRAWING No.

S 002.00

SPECIAL INSPECTIONS:

SPECIAL INSPECTION SHALL MEET THE REQUIREMENTS OF THE ABOVE REFERENCED BUILDING CODE, CHAPTER 17. SPECIAL INSPECTOR(S) SHALL BE RETAINED BY THE OWNER TO PERFORM THE REQUIRED SPECIAL INSPECTIONS. THE NAMES AND QUALIFICATIONS OF THE PERSONS AND/OR FIRMS WHO ARE TO PERFORM THE SPECIAL INSPECTIONS SHALL BE PROVIDED TO THE BUILDING OFFICIAL FOR APPROVAL PRIOR TO THE START OF CONSTRUCTION. THE SPECIAL INSPECTOR(S) SHALL COMPLETE AND SUBMIT ALL FORMS, REPORTS, AND CERTIFICATES REQUIRED BY THE JURISDICTION WHERE CONSTRUCTION OR WORK IS LOCATED.

1. THE SPECIAL INSPECTOR(S) SHALL:
   - A. OBSERVE THE WORK ASSIGNED FOR CONFORMANCE TO THE APPROVED DRAWINGS AND SPECIFICATIONS.
   - B. FURNISH INSPECTION REPORTS TO ENGINEER OF RECORD AND BUILDING DEPARTMENT. DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION, THEN, IF NOT CORRECTED, TO THE ATTENTION OF THE ENGINEER AND THE BUILDING DEPARTMENT.
   - C. SUBMIT TO THE ENGINEER OF RECORD AND THE BUILDING DEPARTMENT A SIGNED FINAL REPORT STATING THAT THE WORK WAS IN CONFORMANCE WITH THE APPROVED DRAWINGS AND SPECIFICATIONS AND THE APPLICABLE WORKMANSHIP PROVISIONS OF THE BUILDING CODE.
2. SPECIAL INSPECTION NOTES:
   - A. WHERE FABRICATION OF STRUCTURAL LOAD-BEARING MEMBERS AND ASSEMBLIES IS BEING PERFORMED ON THE PREMISES OF A FABRICATOR'S SHOP, SPECIAL INSPECTION OF THE FABRICATED ITEMS IS REQUIRED DURING THE PERFORMANCE OF THE WORK EXCEPT WHERE THE FABRICATOR HAS BEEN APPROVED TO PERFORM THE WORK WITHOUT SPECIAL INSPECTION IN ACCORDANCE WITH THE APPLICABLE BUILDING CODE. WHERE SPECIAL INSPECTION HAS BEEN EXEMPTED DURING FABRICATION, FABRICATOR SHALL SUBMIT A CERTIFICATE OF COMPLIANCE IN LIEU OF THE INSPECTION, STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS.
   - B. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE THE SPECIAL INSPECTOR(S) WITH ADVANCE NOTICE, NO LESS THAN 72 HOURS, OF THE INITIATION OF ANY WORK REQUIRED TO HAVE SPECIAL INSPECTIONS. ALL WORK PERFORMED WITHOUT REQUIRED SPECIAL INSPECTION WILL BE SUBJECT TO REMOVAL.
   - C. THE CONSTRUCTION OR WORK FOR WHICH SPECIAL INSPECTION IS REQUIRED SHALL REMAIN ACCESSIBLE AND EXPOSED FOR SPECIAL INSPECTION UNTIL COMPLETION OF THE REQUIRED INSPECTIONS AND/OR TESTS.
3. STRUCTURAL OBSERVATION NOTES:
   - A. WHERE REQUIRED BY THE BUILDING CODE OR BUILDING OFFICIAL, OR ELECTED BY THE OWNER OR ENGINEER OF RECORD, THE ENGINEER OF RECORD OR A DESIGNATED REGISTERED PROFESSIONAL ENGINEER ACTING ON THE OWNER'S OR ENGINEER'S BEHALF MAY PERFORM STRUCTURAL OBSERVATIONS DURING CONSTRUCTION.
   - B. STRUCTURAL OBSERVATIONS DO NOT INCLUDE, OR WAIVE THE RESPONSIBILITY FOR, THE PERFORMANCE OF SPECIAL INSPECTIONS AS REQUIRED HEREIN, OR FOR ANY OTHER INSPECTIONS AS REQUIRED BY THE BUILDING CODE OR BUILDING OFFICIAL.
4. SPECIAL INSPECTIONS AND TESTS OF ELEMENTS OF BUILDINGS AND STRUCTURES SHALL MEET THE APPLICABLE REQUIREMENTS LISTED BELOW.
   - A. STEEL CONSTRUCTION:
     - a. STRUCTURAL STEEL:
       - SPECIAL INSPECTION AND NONDESTRUCTIVE TESTING OF STRUCTURAL STEEL ELEMENTS IN BUILDINGS, STRUCTURES, AND PORTIONS THEREOF SHALL BE IN ACCORDANCE WITH THE QUALITY ASSURANCE INSPECTION REQUIREMENTS OF AISC 360, LATEST EDITION.
     - b. COLD-FORMED STEEL DECK:
       - SPECIAL INSPECTIONS AND QUALIFICATION OF WELDING SPECIAL INSPECTOR(S) FOR COLD-FORMED STEEL FLOOR AND ROOF DECK SHALL BE IN ACCORDANCE WITH THE QUALITY ASSURANCE INSPECTION REQUIREMENTS OF SDI QA/QC.
     - c. OPEN-WEB STEEL JOISTS AND JOIST GIRDERS:
       - SPECIAL INSPECTIONS OF OPEN-WEB STEEL JOISTS AND JOIST GIRDERS IN BUILDINGS, STRUCTURES, AND PORTIONS THEREOF SHALL BE IN ACCORDANCE WITH BUILDING CODE TABLE 1705.2.3.
   - B. CONCRETE CONSTRUCTION:
     - a. SPECIAL INSPECTIONS OF CONCRETE CONSTRUCTION SHALL BE PERFORMED AS LISTED BELOW AND IN ACCORDANCE WITH BUILDING CODE TABLE 1705.3, EXCEPT AS ALLOWED PER THE EXEMPTIONS LISTED IN BUILDING CODE SECTION 1705.3.
     - b. PERIODIC INSPECTION OF REINFORCING STEEL AND PRESTRESSING TENDON MATERIAL AND PLACEMENT.
     - c. PERIODIC INSPECTION OF REINFORCING STEEL WELDING, INCLUDING BAR MATERIAL AND WELDS AS REQUIRED.
     - d. PERIODIC INSPECTION OF ANCHORS CAST IN FRESH CONCRETE.
     - e. INSPECTION OF ANCHORS POST-INSTALLED IN HARDENED CONCRETE PER ACI 318, SECTION 17.8.
     - f. PERIODIC VERIFICATION OF USE OF REQUIRED DESIGN MIX.
     - g. FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE TEMPERATURE OF THE FRESH CONCRETE PRIOR TO CONCRETE PLACEMENT.
     - h. CONTINUOUS INSPECTION OF CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES.
     - i. PERIODIC VERIFICATION OF MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES.
     - j. INSPECT PRESTRESSED CONCRETE FOR APPLICATION OF PRESTRESSING FORCES AND GROUTING OF BONDED PRESTRESSING TENDONS.
     - k. PERIODIC INSPECTION OF ERECTION OF PRECAST CONCRETE MEMBERS.
     - l. VERIFY IN-SITU CONCRETE STRENGTH:
       - PRIOR TO STRESSING OF TENDONS IN POST-TENSIONED CONCRETE, AND
       - PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS AND STRUCTURAL SLABS.
     - m. PERIODIC INSPECTION OF FORMWORK FOR SHAPE, LOCATION, AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED.
   - C. MASONRY CONSTRUCTION:
     - a. SPECIAL INSPECTIONS AND TESTS OF MASONRY CONSTRUCTION, INCLUDING VERTICAL MASONRY FOUNDATION ELEMENTS, SHALL BE PERFORMED IN ACCORDANCE WITH THE QUALITY ASSURANCE PROGRAM REQUIREMENTS OF TMS 402 AND TMS 602, LATEST EDITIONS, EXCEPT AS SPECIFICALLY EXEMPTED BY BUILDING CODE SECTION 1705.4
   - D. SOILS:
     - a. SPECIAL INSPECTIONS AND TESTS OF EXISTING SITE SOIL CONDITIONS, FILL PLACEMENT, AND LOAD-BEARING REQUIREMENTS SHALL BE PERFORMED IN ACCORDANCE WITH BUILDING CODE SECTION 1705.6 AND TABLE 1705.6, INCLUDING:
       - PERIODIC VERIFICATION THAT MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.
       - PERIODIC VERIFICATION THAT EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER BEARING MATERIAL.
       - PERIODIC CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS.
       - CONTINUOUS VERIFICATION OF USE OF PROPER FILL MATERIALS, FILL MATERIAL DENSITIES, AND LIFT THICKNESS DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.
       - PERIODIC INSPECTION OF SUBGRADE PREPARATION PRIOR TO PLACEMENT OF COMPACTED FILL.

TABLE 1704.3 REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION 2018 NYBC

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION	REFERENCED STANDARD	IBC REFERENCE	PERIODIC STAGES	REQ.
1. MATERIAL VERIFICATION OF HIGH-STRENGTH BOLTS, NUTS AND WASHERS COMPLIANCE:						
A. IDENTIFICATION MARKINGS TO CONFORM TO ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS.	-	X	-	-	PRIOR TO ENCLOSING	Y
B. CERTIFICATE OF COMPLIANCE REQUIRED (SHOP DRAWINGS)	-	X	-	-	CONTRACTOR TO SUBMIT SHOP DRAWINGS	Y
2. INSPECTION OF HIGH STRENGTH BOLTING:						
A. BEARING-TYPE CONNECTION	-	X	AISC 360, SECTION MZ.5	1704.3.3	PRIOR TO ENCLOSING	Y
B. SLIP-CRITICAL CONNECTIONS	X	X			PRIOR TO ENCLOSING	N
3. MATERIAL VERIFICATION OF STRUCTURAL STEEL						
A. IDENTIFICATION MARKUPS TO CONFORM TO ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS	-	X	ASTM A6 OR ASTM A558	1708.4	PRIOR TO ENCLOSING	Y
B. MANUFACTURER'S CERTIFIED MILL TEST REPORTS	-	X			CONTRACTOR TO SUBMIT	Y
4. MATERIAL VERIFICATION OF FILLER MATERIALS:						
A. IDENTIFICATION MARKINGS TO CONFORM TO AWS SPECIFICATION IN THE APPROVED CONSTRUCTION DOCUMENTS	-	X	AISC 360, SEC. A3.5	1708.4	PRIOR TO ENCLOSING	Y
B. MANUFACTURER'S CERTIFICATE OF COMPLIANCE REQUIRED (SHOP DRAWINGS)	-	X	-		CONTRACTOR TO SUBMIT AS SHOP DRAWINGS	Y
5. INSPECTION OF WELDING:						
A. STRUCTURAL STEEL						
1. COMPLETE & PARTIAL PENETRATION GROOVE WELD	-	X	AWS D1.1	-		Y
2. MULTI-PASS FILLET WELDS	-	X	AWS D1.1	-		N
3. SINGLE-PASS FILLET WELDS > 5/16" (7.9 MM)	-	X	AWS D1.1	-		N
4. SINGLE-PASS FILLET WELDS < 5/16" (7.9 MM)	-	X	AWS D1.1	-		Y
5. FLOOR & ROOF DECK WELDS	-	X	AWS D1.3	-		N
B REINFORCING STEEL					PRIOR TO ENCLOSING	
1. VERIFICATION OF WELDABILITY OF REINFORCING STEEL OTHER THAN ASTM A 706	-	X	AWS D1.4 ACI 318: 3.5.2	-		N
2. REINFORCING STEEL-RESISTING FLEXURAL & AXIAL FORCES IN INTERMEDIATE & SPECIAL MOMENT FRAMES, & BOUNDARY ELEMENTS OF SPECIAL REINFORCED CONCRETE SHEAR WALLS, & SHEAR REINFORCEMENT	-	X		-		N
3. SHEAR REINFORCEMENT	-	X		-		N
4. OTHER REINFORCING STEEL	-	X		-		N
6. INSPECTION OF STEEL FRAME JOINT DETAILS FOR COMPLIANCE WITH APPROVED CONSTRUCTION DOCUMENTS						
A. DETAILS SUCH AS BRACING AND STIFFENING	-	-	-	1704.3.2	PRIOR TO ENCLOSING	N
B. MEMBER LOCATIONS	-	-	-			N
C. APPLICATION OF JOINT DETAILS AT EACH CONNECTION	-	-	-			N
7. COLD-FORMED STEEL DECK			SDI QA/QC 2022			
A. SDI DECK INSPECTION PROGRAM	X	X	C1/C2 & D1-D4 APPENDIX 1	1705.2, 1705.2.2	PRIOR TO ENCLOSING	Y
B. MANUFACTURER'S CERTIFICATE OF COMPLIANCE REQUIRED (SHOP DRAWINGS & SUBMITTALS)	-	X	SDI QA/QC 2022 B1/B2	1705.2, 1705.2.2		Y

TABLE 1705.3 REQUIRED SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION	REFERENCED STANDARD	IBC REFERENCE	PERIODIC STAGES	REQ.
1. INSPECT REINFORCEMENT, INCLUDING PRESTRESSING TENDONS, AND VERIFY PLACEMENT.	-	X	ACI 318: Ch. 20, 25.2, 25.3, 26.1 - 26.6.3	1705.3, 1908.4	PRIOR TO STARTING POURS WHERE CONCRETE IS TO BE SAMPLED	Y
2. REINFORCING BAR WELDING:						
A. VERIFY WELDABILITY OF REINFORCING BARS OTHER THAN ASTM A706;		X	AWS: D1.4	1705.3, 1705.3.1	PRIOR TO ENCLOSING	Y
B. INSPECT SINGLE-PASS FILLET WELDS, MAXIMUM 5/16", AND:		X	ACI 318: 26.6.4			
C. INSPECT ALL OTHER WELDS.	X					
3. INSPECT ANCHORS CAST IN CONCRETE.	-	X	ACI 318: 17.8.2	1705.3	-	Y
4. INSPECT ANCHORS POST-INSTALLED IN HARDENED CONCRETE MEMBERS.						
A. ADHESIVE ANCHORS INSTALLED IN HORIZONTALLY OR UPWARDLY INCLINED ORIENTATIONS TO RESIST SUSTAINED TENSION LOADS.	X		ACI 318: 17.8.2	1705.3	WHEN INSTALLED	Y
B. MECHANICAL ANCHORS AND ADHESIVE ANCHORS NOT DEFINED IN 4.A.		X	ACI 318: 18.7.2.4			
5. VERIFY USE OF REQUIRED DESIGN MIX.	-	X	ACI 318: CH. 19, 26.4.3, 26.4.4	1705.3, 1904.1-2, 1908.2-3	EACH TIME FRESH CONCRETE IS SAMPLED	Y
6. PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE.	X	-	ASTM C 172, C31 ACI 318: 26.4, 26.12	1705.3, 1908.10	EACH TIME CONCRETE CYLINDERS TAKEN	Y
7. INSPECT CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES.	X	-	ACI 318: 26.5	1705.3, 1908.6-8	EACH TIME FRESH CONCRETE IS SAMPLED	Y
8. VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES.	-	X	ACI 318: 28.5.3 - 26.5.5	1705.3, 1908.9	(1) UNANNOUNCED INSPECTION FOR EVERY 250 CY. OF CONCR. PLACED FOR ENTIRE PROJ.	Y
9. INSPECT PRESTRESSED PRESTRESSED CONCRETE FOR:						
A. APPLICATION OF PRESTRESSING FORCES; AND	X	-	ACI 318: 26.10	1705.3	-	N
B. GROUTING OF BONDED PRESTRESSING TENDONS.	X	-				
10. INSPECT ERECTION OF PRECAST CONCRETE MEMBERS.	-	X	ACI 318: Ch. 26.8	1705.3	PRIOR TO ENCLOSING	N
11. VERIFY IN-SITU CONCRETE STRENGTH, PRIOR TO STRESSING OF TENDONS IN POST-TENSIONED CONCRETE AND PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS AND STRUCTURAL SLABS.	-	X	ACI 318: 26.11.2	1705.3	-	N
12. INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED.	-	X	ACI 318: 26.11.2(b)		-	Y
13. MATERIAL TESTS - IN ABSENCE OF SUFFICIENT DATA OR DOCUMENTATION FOR MATERIALS.	-	X	ACI 318 Ch. 19 - 20		-	X

FOR SI: 1 INCH = 25.4 mm.

A. WHERE APPLICABLE, SEE SECTION 1705.12, SPECIAL INSPECTIONS FOR SEISMIC RESISTANCE.

B. SPECIFIC REQUIREMENTS FOR SPECIAL INSPECTION SHALL BE INCLUDED IN THE RESEARCH REPORT FOR THE ANCHOR ISSUED BY AN APPROVED SOURCE IN ACCORDANCE WITH 17.8.2. IN ACI 318, OR OTHER QUALIFICATION PROCEDURES. WHERE SPECIFIED REQUIREMENTS ARE NOT PROVIDED, SPECIAL INSPECTION REQUIREMENTS SHALL BE SPECIFIED BY THE REGISTERED DESIGN PROFESSIONAL AND SHALL BE APPROVED BY THE BUILDING OFFICIAL PRIOR TO THE COMMENCEMENT OF THE WORK.

TMS 602 TABLE 4 - MINIMUM SPECIAL INSPECTION REQUIREMENTS

MINIMUM VERIFICATION	FREQUENCY (a)			REFERENCE FOR CRITERIA		IBC REFERENCE	PERIODIC STAGES	REQ.
	LEVEL 1	LEVEL 2	LEVEL 3	TMS 402	IBC REFERENCE			
1. AS MASONRY CONSTRUCTION BEGINS, VERIFY THAT THE FOLLOWING ARE IN COMPLIANCE:								
A. PROPORTIONS OF SITE-PREPARED MORTAR	NR	P	P	-	ART. 2.1, 2.6 A, & 2.6 C			Y
B. GRADE AND SIZE OF PRESTRESSING TENDONS AND ANCHORAGE	NR	P	P	-	ART. 2.4 B & 2.4 H			Y
C. GRADE, TYPE AND SIZE AND REINFORCEMENT, CONNECTORS, ANCHOR BOLTS, AND PRESTRESSING TENDONS AND ANCHORAGES	NR	P	P	-	ART. 3.4 & 3.6 A			Y
D. PRESTRESSING TECHNIQUE	NR	P	P	-	ART. 3.6 B			N
E. PROPERTIES OF THIN-BED MORTAR FOR AAC MASONRY	NR	C[b]/P[c]	P	-	ART. 2.1 C.1			N
F. SAMPLE PANEL CONSTRUCTION	NR	P	P	-	ART. 1.6 D			N
2. PRIOR TO GROUTING, VERIFY THAT THE FOLLOWING ARE IN COMPLIANCE:								
A. GROUT SPACE	NR	P	P	-	ART. 3.2 D & 3.2 F			Y
B. PLACEMENT OF PRESTRESSING TENDONS AND ANCHORAGES	NR	P	P	SEC. 10.8 & 10.9	ART. 2.4 & 3.6			Y
C. PLACEMENT OF REINFORCEMENT, CONNECTORS, AND ANCHOR BOLTS	NR	P	C	SEC. 6.1, 6.3.1, 6.3.6, & 6.3.7	ART. 3.2 E & 3.4			Y
D. PROPORTIONS OF SITE-PREPPED GROUT AND PRESTRESSING GROUT FOR BONDED TENDONS	NR	P	P	-	ART. 2.6 B & 2.4 G.1.b			Y
3. VERIFY COMPLIANCE OF THE FOLLOWING DURING CONSTRUCTION:								
A. MATERIALS AND PROCEDURES WITH THE APPROVED SUBMITTALS	NR	P	P	-	ART. 1.5			Y
B. PLACEMENT OF MASONRY UNITS AND MORTAR JOINT CONSTRUCTION	NR	P	P	-	ART. 3.3 B			Y
C. SIZE AND LOCATION OF STRUCTURAL MEMBERS	NR	P	P	-	ART. 3.3 F			Y
D. TYPE, SIZE, AND LOCATIONS OF ANCHORS, INCLUDING OTHER DETAILS OF ANCHORAGE OF MASONRY TO STRUCTURAL MEMBERS, FRAMES, OR OTHER CONSTRUCTION	NR	P	C	SEC. 1.2.1 (e), 6.2.1 & 6.3.1	-			Y
E. WELDING OF REINFORCEMENT	NR	C	C	SEC. 6.1.6.1.2	-			Y
F. PREPARATION, CONSTRUCTION, AND PROTECTION OF MASONRY DURING COLD WEATHER (TEMPERATURE BELOW 40F (4.4°C) OR HOT WEATHER (TEMPERATURE ABOVE 90°F (32.2°C))	NR	P	P	-	ART. 1.8 C & 1.8 D			Y
G. APPLICATION AND MEASUREMENT OF PRESTRESSING FORCE	NR	C	C	-	ART. 3.6 B			N
H. PLACEMENT OF GROUT AND PRESTRESSING GROUT FOR BONDED TENDONS IN COMPLIANCE	NR	C	C	-	ART. 3.5 B & 3.6 C			N
I. PLACEMENT OF AAC MASONRY UNITS AND CONSTRUCTION OF THIN-BED MORTAR JOINTS	NR	C[b]/P[c]	C	-	ART. 3.3 B.9 & 3.3 F.1.b			N
4. OBSERVE PREPARATION OF GROUT SPECIMENS, MORTAR SPECIMENS, AND/OR PRISMS	NR	P	P	-	ART. 1.4 B.2.a.3, 1.4 B.2.b.3, 1.4 B.2.c.3, 1.4 B.3, & 1.4 B.4			Y

(a) FREQUENCY REFERS TO THE FREQUENCY OF INSPECTION, WHICH MAY BE CONTINUOUS DURING THE LISTED TASK OR PERIODICALLY DURING THE LISTED TASK, AS DEFINED IN THE TABLE.
NR = NOT REQUIRED, P = PERIODIC, C = CONTINUOUS
(b) REQUIRED FOR THE FIRST 5000 SQUARE FEET (456 SQUARE METERS) OF AAC MASONRY
(c) REQUIRED AFTER THE FIRST 5000 SQUARE FEET (465 SQUARE METERS) OF AAC MASONRY.

TABLE 1705.2.3 REQUIRED SPECIAL INSPECTIONS OF OPEN-WEB STEEL JOISTS AND GIRDERS

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION	REFERENCED STANDARD	PERIODIC STAGES	REQ.
1. INSTALLATION OF OPEN-WEB STEEL JOISTS AND JOIST GIRDERS.					
A. END CONNECTIONS - WELDING OR BOLTED.	-	X	SJI SPECIFICATIONS LISTED IN SECTION 2207.1	PRIOR TO ENCLOSING	Y
B. BRIDGING - HORIZONTAL OR DIAGONAL.	-	-			
2. STANDARD BRIDGING.	-	X	SJI SPECIFICATIONS LISTED IN SECTION 2207.1	PRIOR TO ENCLOSING	Y
3. BRIDGING THAT DIFFERS FROM THE SJI SPECIFICATIONS LISTED IN SECTION 2207.1	-	X	-	PRIOR TO ENCLOSING	Y

TABLE 1705.6 REQUIRED SPECIAL INSPECTIONS AND TESTS OF SOILS

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION	REFERENCED STANDARD	IBC REFERENCE	PERIODIC STAGES	REQ.
1. VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.	-	X	-	-	AT COMPLETION OF EXCAVATION	Y
2. VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL.	-	X	-	-	AT COMPLETION OF EXCAVATION	Y
3. PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS.	-	X	-	-	AT COMPLETION OF COMPACTION	Y
4. VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESS DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.	X	-	-	-	-	Y
5. PRIOR TO PLACEMENT OF COMPACTED FILL, INSPECT SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY.	-	X	-	-	AT COMPLETION OF EXCAVATION	Y

H2M architects + engineers
538 Broad Hollow Road, 4th Floor East
Melville, NY 11747
631.756.8000 • www.h2m.com
NY Architecture & Landscape Architecture: No Certificate Required
NY Engineering Certificate of Authorization No.: 0018178

CONSULTANTS:

MARK	DATE	DESCRIPTION
1	03/19/2025	BID ADDENDUM #1

STATE OF NEW YORK · DANIEL J. AIELLO · 100515 · LICENSED PROFESSIONAL ENGINEER

04/30/2027
Exp. Date

DANIEL J. AIELLO, P.E.
NY PROFESSIONAL ENGINEER Lic. No. 100515

"IN ACCORDANCE WITH ARTICLE 145, SECTION 7209 OF THE NYS EDUCATION LAW, ALTERATION OF THIS DOCUMENT EXCEPT BY A LICENSED PROFESSIONAL IS ILLEGAL."

DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
JJN	JJN	DJA	DJA

PROJECT No: TRFD 2302 | DATE: MARCH 2025 | SCALE: AS SHOWN

CLIENT
THIELLS ROSEVILLE FIRE DISTRICT

NEW 26-100 FIRE HEADQUARTERS

65 W RAMAPO ROAD GARNERVILLE, NY 10923

CONTRACT
CONTRACT G

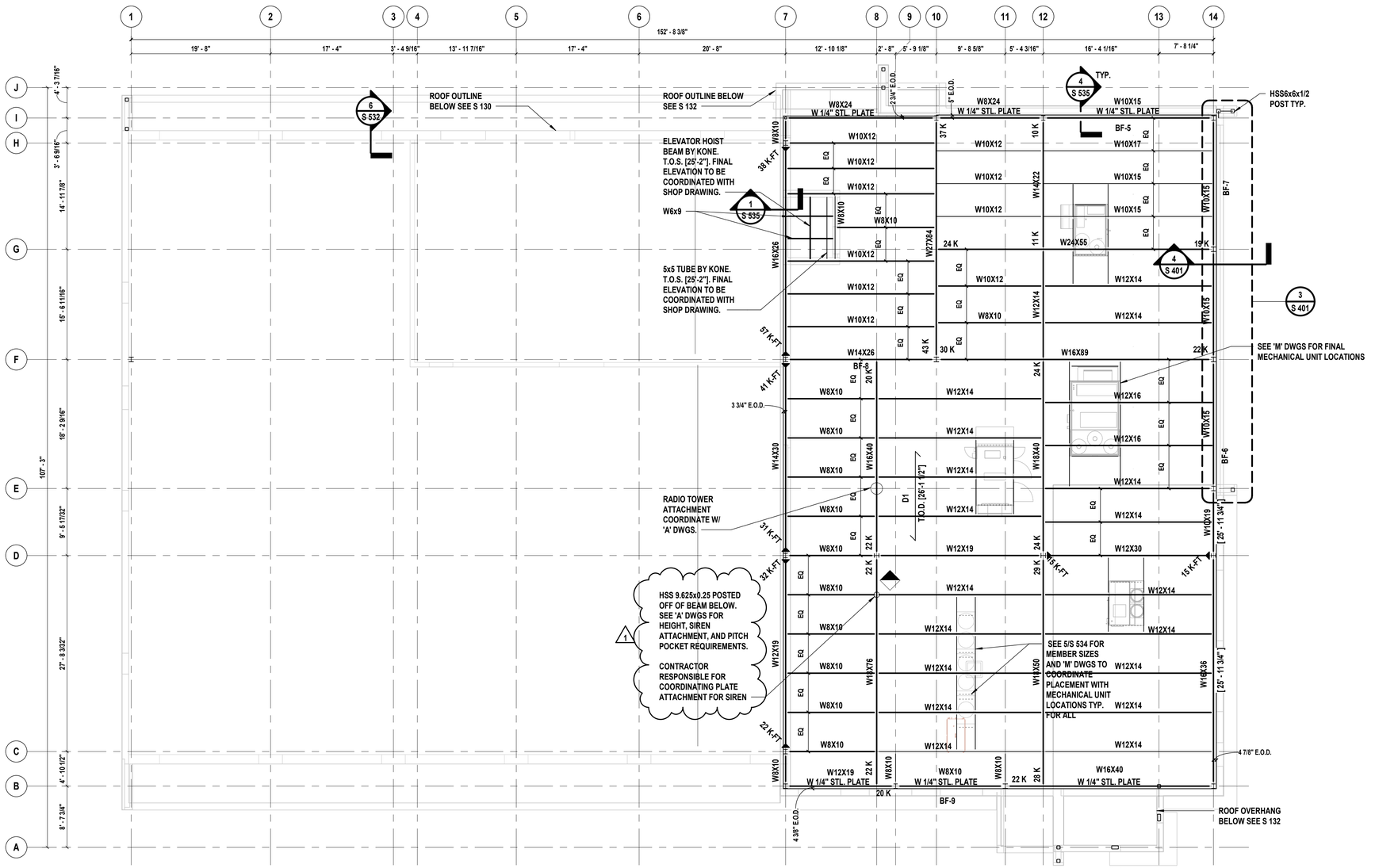
STATUS
BID ADDENDUM NO.1

SHEET TITLE
SPECIAL INSPECTIONS

DRAWING No.
S 003.00

C:\Users\jnieubauer\Documents\TRFD2302_Central20-S_jnieubauerLCL25.rvt

3/19/2025 3:16:25 PM



1 High Roof Framing Plan

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

NOTES:

1. TOP OF STEEL SHALL BE SET AT [26'-0"] ABOVE FINISHED FIRST FLOOR ELEVATION UNLESS OTHERWISE NOTED AS THUS [ ].
2. D1 INDICATES SPAN OF 1.5B-36 19GA. ROOF DECK BY VULCRAFT NUCOR OR APPROVED EQUAL
3. INSTALL BRIDGING FOR BAR JOISTS AS PER S.J.I. REQUIREMENTS.
4. SEE 'A' DWGS FOR EDGE OF DECK DIMENSIONS.
5. INDICATES BEAM TO COLUMN MOMENT CONNECTION WITH THE NUMBER REPRESENTING THE L.R.F.D. DESIGN MOMENT IN FT-KIPS.
6. STEEL CONNECTION PIECE DETAILS SHALL BE SUBMITTED WITH CALCULATIONS SIGNED AND SEALED BY A NEW YORK STATE LICENSED PROFESSIONAL ENGINEER. CONNECTION DESIGNER SHALL DESIGN ALL MOMENT CONNECTIONS AND SIMPLE SHEAR CONNECTIONS. WHERE DESIGN SHEAR REACTION IS NOT LISTED ON DRAWINGS, IT SHALL BE TAKEN AS 15 KIPS LRFD. WHERE AXIAL FORCE IN BEAMS IS NOT LISTED IN DRAWINGS, IT SHALL BE TAKEN AS 15 KIPS LRFD. ALL CONNECTIONS SHALL BE DESIGNED CONSIDERING AXIAL, SHEAR AND MOMENT FORCES SIMULTANEOUSLY AS REQUIRED BY BUILDING CODE. SEE STRUCTURAL STEEL SPECIFICATIONS FOR ADDITIONAL DESIGN LOADING REQUIREMENTS.
7. COORDINATE DIMENSIONS OF STAIR LANDING FRAMING WITH STAIR MANUFACTURER. SEE 'A' DWGS. FOR ADDITIONAL INFORMATION.

LEGEND:

= HANGER BELOW

= CARRIED COLUMN/HANGER ABOVE

E.O.S. = EDGE OF SLAB

H2M architects + engineers

538 Broad Hollow Road, 4th Floor East
Melville, NY 11747
631.756.8000 • www.h2m.com
NY Architecture & Landscape Architecture: No Certificate Required
NY Engineering Certificate of Authorization No.: 0018178

CONSULTANTS:

MARK	DATE	DESCRIPTION
1	03/19/2025	BID ADDENDUM #1

STATE OF NEW YORK
DANIEL J. AIELLO
100515
LICENSED PROFESSIONAL ENGINEER

04/30/2027
Exp. Date

DANIEL J. AIELLO, P.E.
NY PROFESSIONAL ENGINEER Lic. No. 100515

"IN ACCORDANCE WITH ARTICLE 145, SECTION 7209 OF THE NYS EDUCATION LAW, ALTERATION OF THIS DOCUMENT EXCEPT BY A LICENSED PROFESSIONAL IS ILLEGAL."

DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
JJN	SRK	JJN	DJA

PROJECT No:	DATE:	SCALE:
TRFD 2302	MARCH 2025	AS SHOWN

CLIENT

THIELLS ROSEVILLE FIRE DISTRICT

NEW 26-100 FIRE HEADQUARTERS

THIELLS 26 FD

65 W RAMAPO ROAD GARNERVILLE, NY 10923

CONTRACT

CONTRACT G

STATUS

BID ADDENDUM NO.1

SHEET TITLE

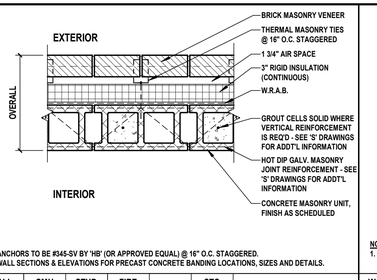
HIGH ROOF FRAMING PLAN

DRAWING No.

S 131.00

C:\Users\jjneubauer\Documents\TRFD2302_Central23-S_jneubauerLCLCS.rvt

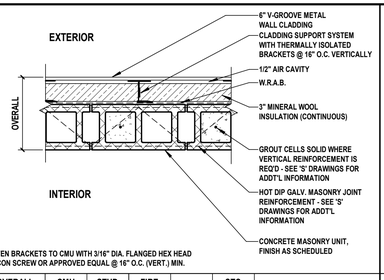
3/19/2025 3:16:25 PM



NOTES:
1. MASONRY ANCHORS TO BE #345-SV BY 'HB' (OR APPROVED EQUAL) @ 16" O.C. STAGGERED.
2. REFER TO WALL SECTIONS & ELEVATIONS FOR PRECAST CONCRETE BANDING LOCATIONS, SIZES AND DETAILS.

WALL TYPE	OVERALL DIMENSIONS	CMU SIZE	STUD SIZE	FIRE RATING	UL No.	STC RATING	COMMENTS
1A	1'- 4"	7 5/8"	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-

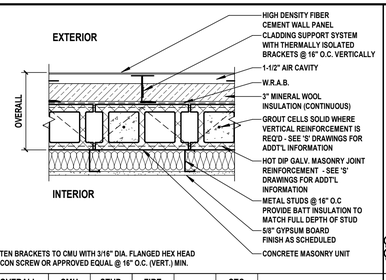
1 Masonry Veneer
Exterior Partition



NOTES:
1. FASTEN BRACKETS TO CMU WITH 3/16" DIA. FLANGED HEX HEAD TAPCON SCREW OR APPROVED EQUAL @ 16" O.C. (VERT.) MIN.

WALL TYPE	OVERALL DIMENSIONS	CMU SIZE	STUD SIZE	FIRE RATING	UL No.	STC RATING	COMMENTS
2A	11 5/8"	7 5/8"	-	-	-	-	FINISH AS SCHEDULED
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-

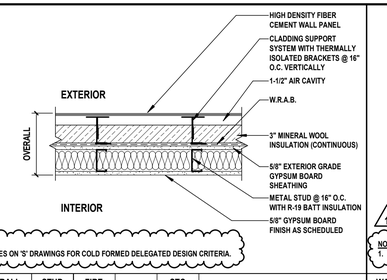
2 CMU w/ Aluminum Siding
Exterior Partition



NOTES:
1. FASTEN BRACKETS TO CMU WITH 3/16" DIA. FLANGED HEX HEAD TAPCON SCREW OR APPROVED EQUAL @ 16" O.C. (VERT.) MIN.

WALL TYPE	OVERALL DIMENSIONS	CMU SIZE	STUD SIZE	FIRE RATING	UL No.	STC RATING	COMMENTS
3A	16 3/4"	7 5/8"	3 5/8"	-	-	-	FINISH AS SCHEDULED
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-

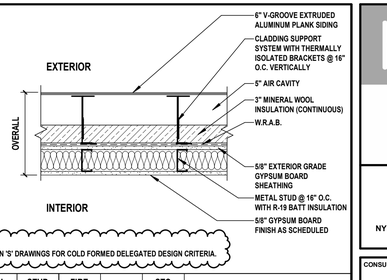
3 CMU w/ Fiber Cement Panels
Exterior Partition



1
NOTES:
1. SEE NOTES ON 'S' DRAWINGS FOR COLD FORMED DELEGATED DESIGN CRITERIA.

WALL TYPE	OVERALL DIMENSIONS	STUD SIZE	FIRE RATING	UL No.	STC RATING	COMMENTS
4A	12 1/8"	6"	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

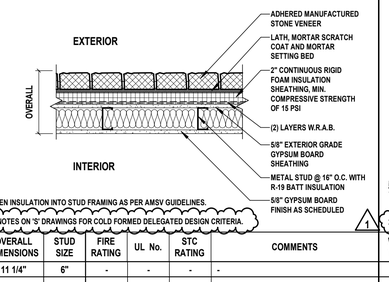
4 Metal Stud w/ Fiber Cement Panels
Exterior Partition



1
NOTES:
1. SEE NOTES ON 'S' DRAWINGS FOR COLD FORMED DELEGATED DESIGN CRITERIA.

WALL TYPE	OVERALL DIMENSIONS	STUD SIZE	FIRE RATING	UL No.	STC RATING	COMMENTS
5A	15 3/4"	6"	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

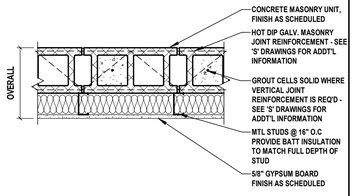
5 Metal Stud w/ Aluminum Siding
Exterior Partition



1
NOTES:
1. FASTEN INSULATION INTO STUD FRAMING AS PER AMSV GUIDELINES.
2. SEE NOTES ON 'S' DRAWINGS FOR COLD FORMED DELEGATED DESIGN CRITERIA.

WALL TYPE	OVERALL DIMENSIONS	STUD SIZE	FIRE RATING	UL No.	STC RATING	COMMENTS
6A	11 1/4"	6"	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

6 Metal Stud w/ Stone Veneer
Exterior Partition

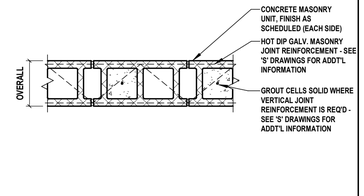


NOTE:
1. REFER TO CODE COMPLIANCE PLAN FOR ADDITIONAL INFORMATION ON FIRE RATED WALL LOCATIONS. ALL PENETRATIONS IN FIRE RATED PARTITIONS SHALL BE FIRESTOPPED.

1
NOTES:
2. SEE NOTES ON 'S' DRAWINGS FOR COLD FORMED DELEGATED DESIGN CRITERIA.

WALL TYPE	OVERALL DIMENSIONS	CMU SIZE	STUD SIZE	FIRE RATING	UL No.	STC RATING	COMMENTS
7A	11 7/8"	7 5/8"	3 5/8"	-	-	-	-
7B	11 7/8"	7 5/8"	3 5/8"	1HR	U905	-	-
-	-	-	-	-	-	-	-

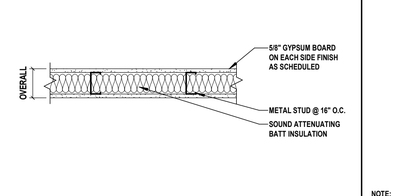
7 CMU w/ Metal Stud
Interior Partition



NOTE:
1. REFER TO CODE COMPLIANCE PLAN FOR ADDITIONAL INFORMATION ON FIRE RATED WALL LOCATIONS. ALL PENETRATIONS IN FIRE RATED PARTITIONS SHALL BE FIRESTOPPED.

WALL TYPE	OVERALL DIMENSIONS	CMU SIZE	STUD SIZE	FIRE RATING	UL No.	STC RATING	COMMENTS
8A	7 5/8"	7 5/8"	1HR	U906	-	-	-
8B	7 5/8"	7 5/8"	-	-	-	-	-
8C	5 5/8"	5 5/8"	-	-	-	-	-

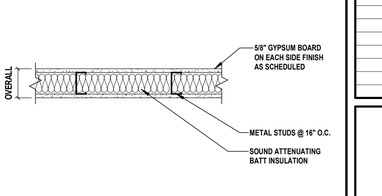
8 CMU Partition
Interior Partition



1
NOTES:
1. SEE NOTES ON 'S' DRAWINGS FOR COLD FORMED DELEGATED DESIGN CRITERIA.

WALL TYPE	OVERALL DIMENSIONS	STUD SIZE	FIRE RATING	UL No.	STC RATING	COMMENTS
9A	4 7/8"	3 5/8"	-	-	-	-
9B	7 1/4"	6"	-	-	-	-
9C	3 3/4"	2 1/2"	-	-	-	-

9 Metal Stud Partition
Interior Partition

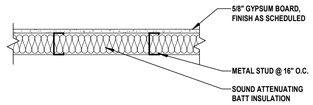


NOTE:
1. REFER TO CODE COMPLIANCE PLAN FOR ADDITIONAL INFORMATION ON FIRE RATED WALL LOCATIONS. ALL PENETRATIONS IN FIRE RATED PARTITIONS SHALL BE FIRESTOPPED.

1
NOTES:
2. SEE NOTES ON 'S' DRAWINGS FOR COLD FORMED DELEGATED DESIGN CRITERIA.

WALL TYPE	OVERALL DIMENSIONS	STUD SIZE	FIRE RATING	UL No.	STC RATING	COMMENTS
10A	4 7/8"	3 5/8"	1HR	U419	54	-
10B	7 1/4"	6"	1 HR	U419	-	-
-	-	-	-	-	-	-

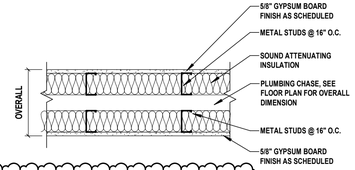
10 1 HR Metal Stud Partition
Interior Partition



1
NOTES:
1. SEE NOTES ON 'S' DRAWINGS FOR COLD FORMED DELEGATED DESIGN CRITERIA.

WALL TYPE	OVERALL DIMENSIONS	STUD SIZE	FIRE RATING	UL No.	STC RATING	COMMENTS
11A	4 1/4"	3 5/8"	-	-	-	-
11B	6 5/8"	6"	-	-	-	-
-	-	-	-	-	-	-

11 Metal Stud Partition
Interior Partition



1
NOTES:
1. SEE NOTES ON 'S' DRAWINGS FOR COLD FORMED DELEGATED DESIGN CRITERIA.

WALL TYPE	OVERALL DIMENSIONS	STUD SIZE	FIRE RATING	UL No.	STC RATING	COMMENTS
12A	-	3 5/8"	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

12 Metal Stud Chase Wall
Interior Partition

H 2 M architects + engineers
538 Broad Hollow Road, 4th Floor East
Melville, NY 11747
631.756.8000 • www.h2m.com
NY Architecture & Landscape Architecture: No Certificate Required
NY Engineering Certificate of Authorization No.: 0018178

CONSULTANTS:

MARK	DATE	DESCRIPTION
1	03/19/2025	ADDENDUM #1

REGISTERED ARCHITECT PATRICK OTTO STONE 039654 STATE OF NEW YORK

10/31/2025
PATRICK O. STONE, R.A.
NY PROFESSIONAL ARCHITECT Lic. No. 039654
Exp. Date

DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
DBS/RLG	ANK	DBS	POS

PROJECT No:	DATE:	SCALE:
TRFD 2302	FEBRUARY 2025	AS SHOWN

CLIENT

THIELLS ROSEVILLE FIRE DISTRICT

NEW 26-100 FIRE HEADQUARTERS

THIELLS 26 FD

65 W RAMAPO ROAD GARNERVILLE, NY 10923

CONTRACT

CONTRACT G GENERAL CONSTRUCTION

STATUS

FINAL BID DOCUMENT

SHEET TITLE

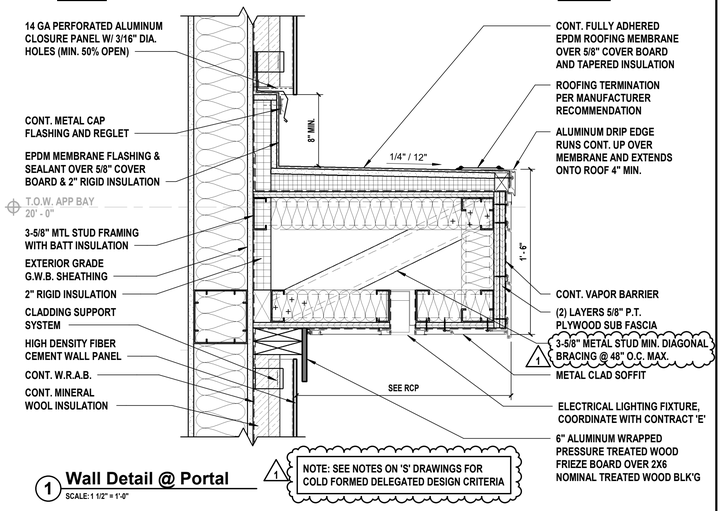
PARTITION TYPES

DRAWING No.

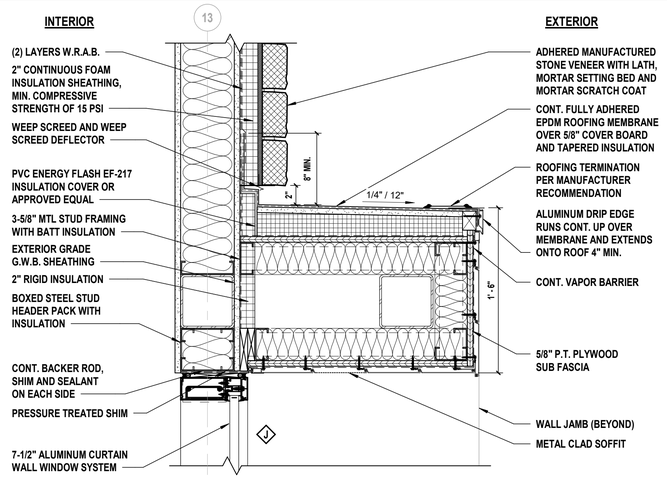
A 000.01

C:\Users\akaled\Documents\TRFD2302_Central23-A_AKaled.rvt

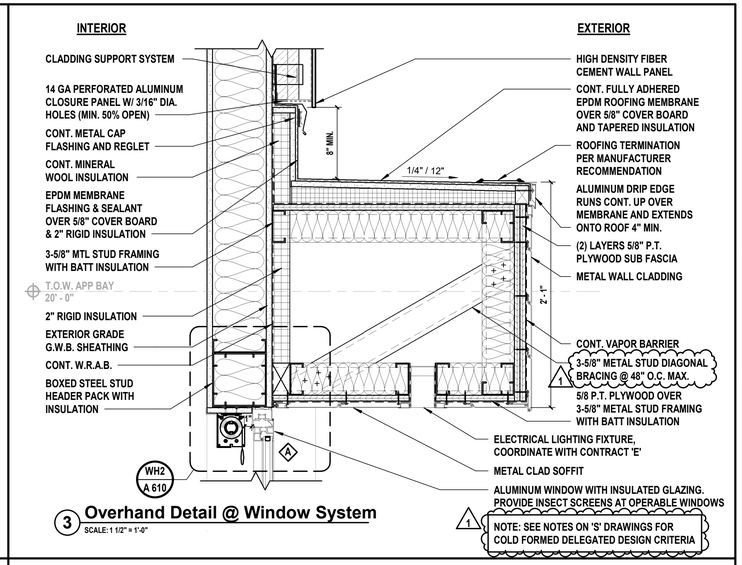
3/19/2025 10:36:45 AM



1 Wall Detail @ Portal
SCALE: 1 1/2" = 1'-0"



2 Wall Detail @ Curtain Wall Below
SCALE: 1 1/2" = 1'-0"



3 Overhand Detail @ Window System
SCALE: 1 1/2" = 1'-0"

4 Wall Detail @ Curtain Wall Above
SCALE: 1 1/2" = 1'-0"

5 Wall Detail @ Curtain Wall Above
SCALE: 1 1/2" = 1'-0"

H 2 M architects + engineers
538 Broad Hollow Road, 4th Floor East
Melville, NY 11747
631.756.8000 • www.h2m.com
NY Architecture & Landscape Architecture: No Certificate Required
NY Engineering Certificate of Authorization No.: 0018178

CONSULTANTS:

MARK	DATE	DESCRIPTION
1	03/19/2025	ADDENDUM #1

REGISTERED ARCHITECT PATRICK OTTO STONE 039654 STATE OF NEW YORK

PATRICK O. STONE, R.A.
NY PROFESSIONAL ARCHITECT Lic. No. 039654
10/31/2025
Exp. Date

"IN ACCORDANCE WITH ARTICLE 145, SECTION 7209 OF THE NYS EDUCATION LAW, ALTERATION OF THIS DOCUMENT EXCEPT BY A LICENSED PROFESSIONAL IS ILLEGAL."

DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
DBS/RLG	ANK	DBS	POS

PROJECT No:	DATE:	SCALE:
TRFD 2302	FEBRUARY 2025	AS SHOWN

CLIENT
THIELLS ROSEVILLE FIRE DISTRICT

NEW 26-100 FIRE HEADQUARTERS

65 W RAMAPO ROAD GARNERVILLE, NY 10923

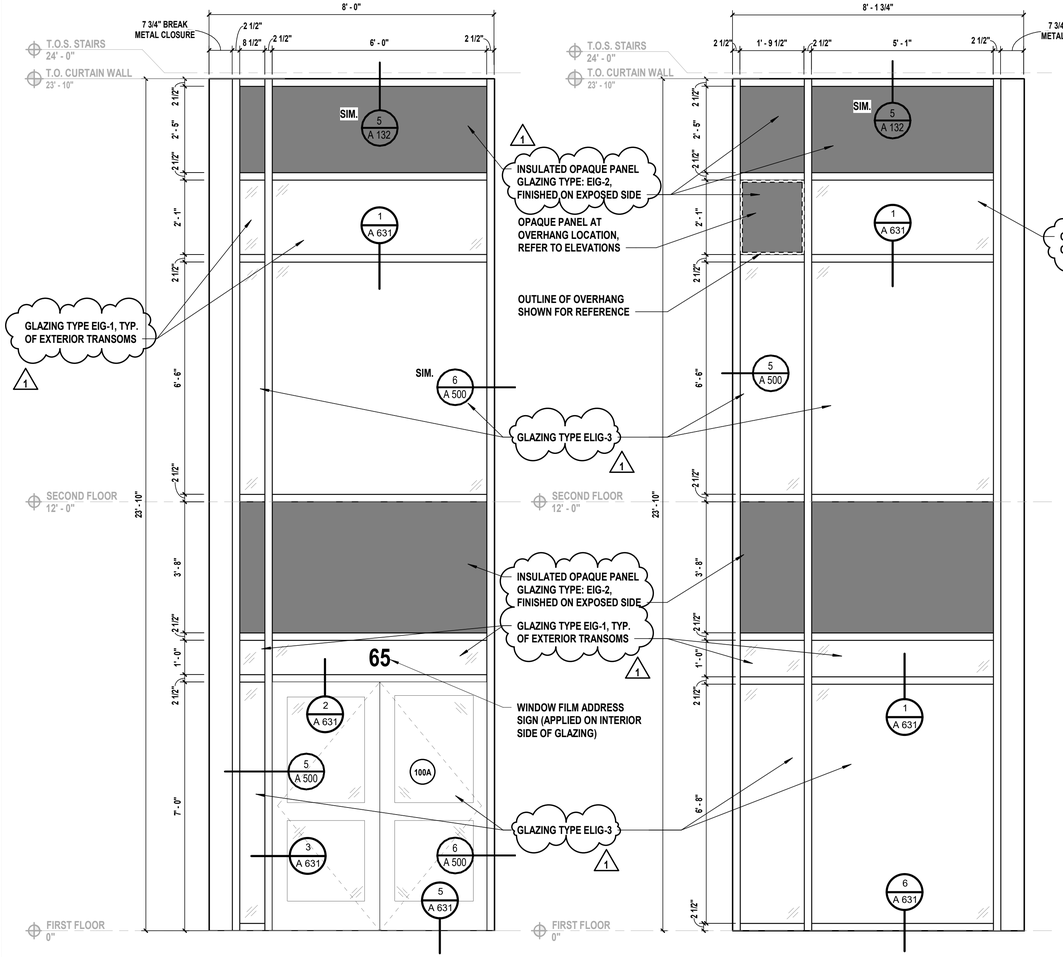
CONTRACT
CONTRACT G GENERAL CONSTRUCTION

STATUS
FINAL BID DOCUMENT

SHEET TITLE
SECTION DETAILS

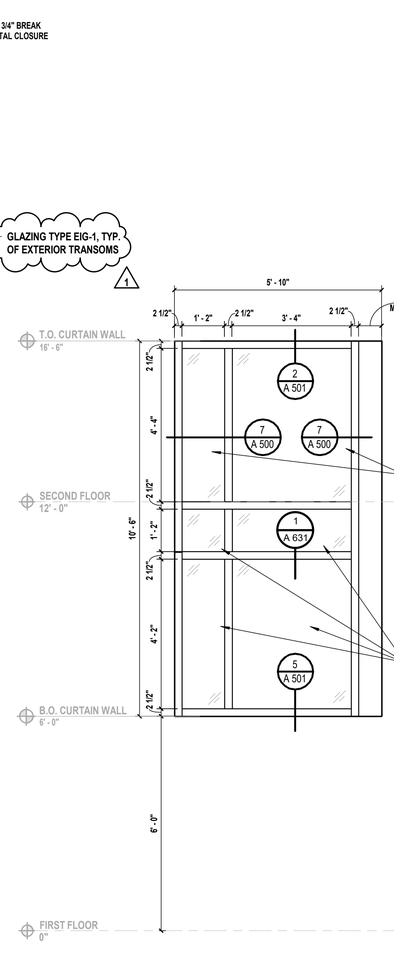
DRAWING No.
A 501.01

C:\Users\alakied\Documents\TRFD2302_Central25-A_AKalied.rvt
3/19/2025 10:38:47 AM

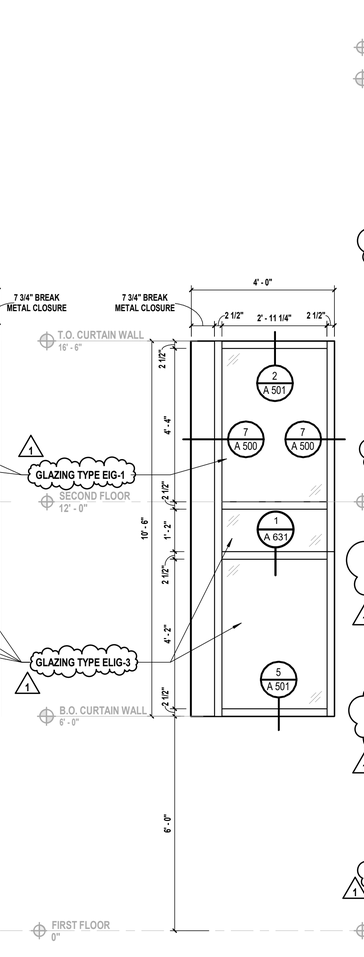


G **Curtain Wall Type G**
SCALE: 1/2" = 1'-0"

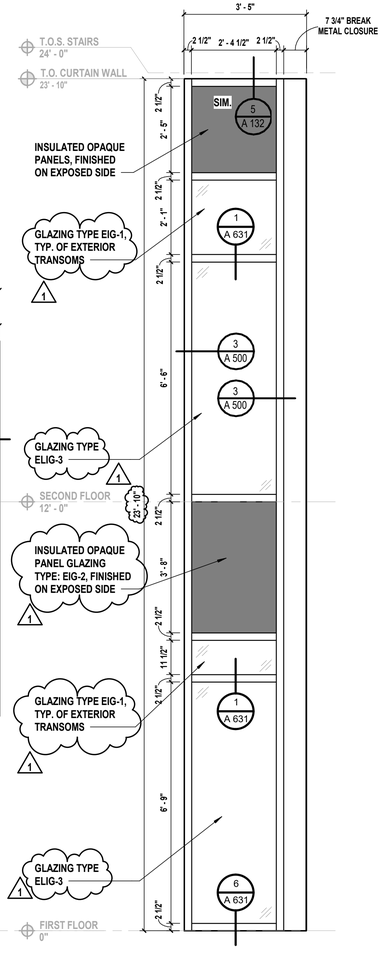
H **Curtain Wall Type H**
SCALE: 1/2" = 1'-0"



I **Curtain Wall Type I**
SCALE: 1/2" = 1'-0"



J **Curtain Wall Type J**
SCALE: 1/2" = 1'-0"



K **Curtain Wall Type K**
SCALE: 1/2" = 1'-0"

H 2 M architects + engineers

538 Broad Hollow Road, 4th Floor East
Melville, NY 11747
631.756.8000 • www.h2m.com
NY Architecture & Landscape Architecture: No Certificate Required
NY Engineering Certificate of Authorization No.: 0018178

CONSULTANTS:

MARK	DATE	DESCRIPTION
1	03/14/2025	ADDENDUM #1

REGISTERED ARCHITECT PATRICK OTTO STONE 039654 STATE OF NEW YORK

10/31/2025
Exp. Date

PATRICK O. STONE, R.A.
NY PROFESSIONAL ARCHITECT Lic. No. 039654

"IN ACCORDANCE WITH ARTICLE 145, SECTION 7209 OF THE NYS EDUCATION LAW, ALTERATION OF THIS DOCUMENT EXCEPT BY A LICENSED PROFESSIONAL IS ILLEGAL."

DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
DBS/RLG	KAP	DBS	POS

PROJECT No:	DATE:	SCALE:
TRFD 2302	FEBRUARY 2025	AS SHOWN

CLIENT

THIELLS ROSEVILLE FIRE DISTRICT

NEW 26-100 FIRE HEADQUARTERS

65 W RAMAPO ROAD GARNERVILLE, NY 10923

CONTRACT

CONTRACT G GENERAL CONSTRUCTION

STATUS

FINAL BID DOCUMENT

SHEET TITLE

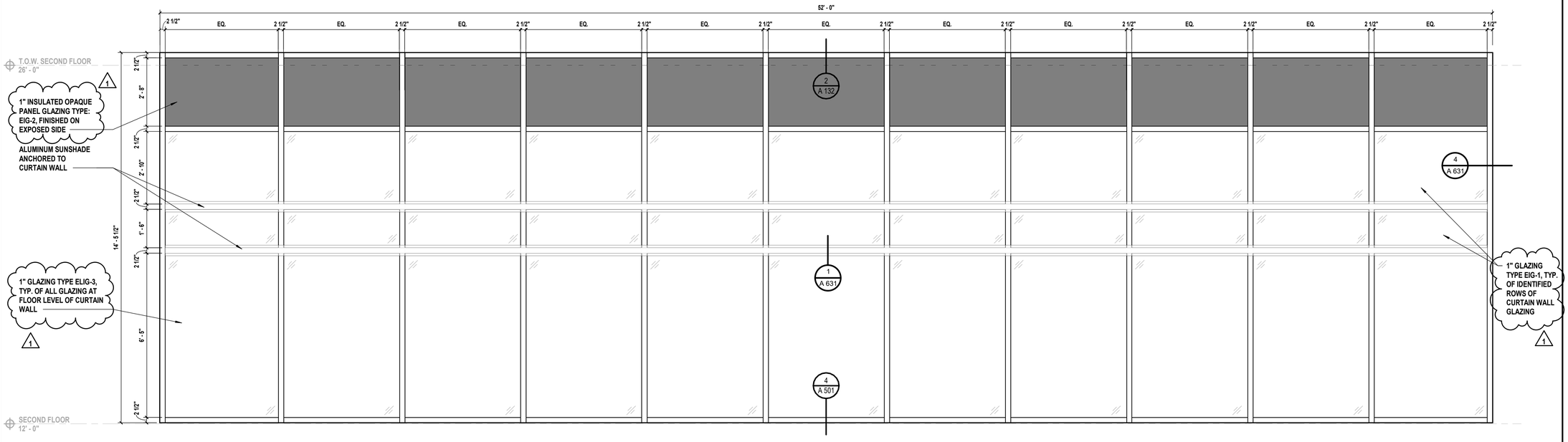
CURTAIN WALL TYPES

DRAWING No.

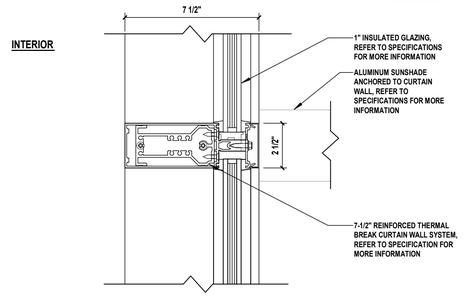
A 630.00

C:\Users\rgnodzk\Documents\TRFD2302_Central23-A_rgnodzk.rvt

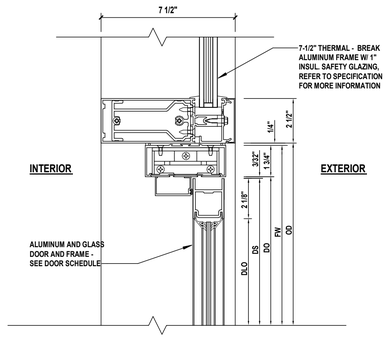
3/12/2025 5:51:24 PM



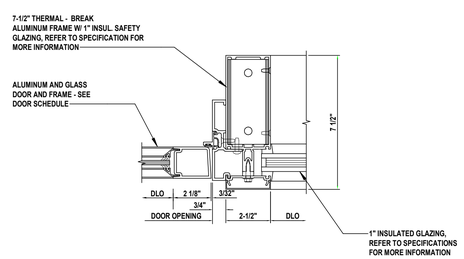
L Curtain Wall Type L
SCALE: 1/2" = 1'-0"



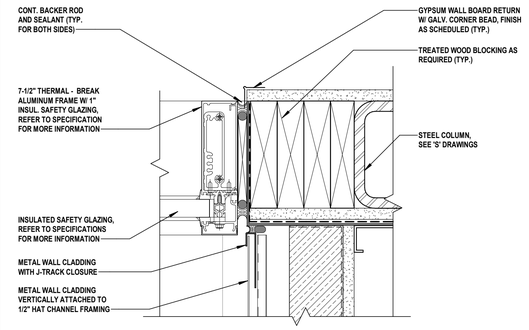
1 Horizontal Detail
SCALE: 3" = 1'-0"



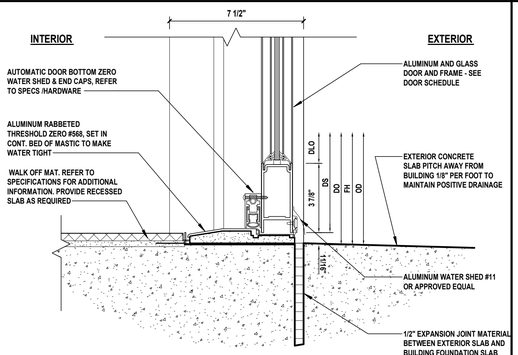
2 Door Head Detail
SCALE: 3" = 1'-0"



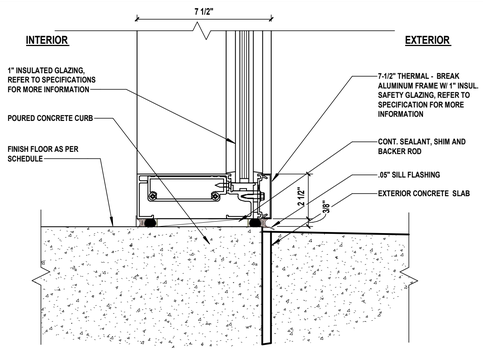
3 Door Jamb Detail
SCALE: 3" = 1'-0"



4 Curtain Wall Jamb
SCALE: 3" = 1'-0"



5 Door Threshold Detail
SCALE: 3" = 1'-0"



6 Curtain Wall Sill
SCALE: 3" = 1'-0"

H 2 M architects + engineers
538 Broad Hollow Road, 4th Floor East
Melville, NY 11747
631.756.8000 • www.h2m.com
NY Architecture & Landscape Architecture: No Certificate Required
NY Engineering Certificate of Authorization No.: 0018178

CONSULTANTS:

MARK	DATE	DESCRIPTION
1	03/14/2025	ADDENDUM #1

REGISTERED ARCHITECT PATRICK OTTO STONE 039654 STATE OF NEW YORK

10/31/2025
Exp. Date

PATRICK O. STONE, R.A.
NY PROFESSIONAL ARCHITECT LIC. No. 039654

"IN ACCORDANCE WITH ARTICLE 145, SECTION 7209 OF THE NYS EDUCATION LAW, ALTERATION OF THIS DOCUMENT EXCEPT BY A LICENSED PROFESSIONAL IS ILLEGAL."

DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
DBS/RLG	KAP	DBS	POS

PROJECT No:	DATE:	SCALE:
TRFD 2302	FEBRUARY 2025	AS SHOWN

CLIENT

THIELLS ROSEVILLE FIRE DISTRICT

NEW 26-100 FIRE HEADQUARTERS

THIELLS 26 FD

65 W RAMAPO ROAD GARNERVILLE, NY 10923

CONTRACT

CONTRACT G GENERAL CONSTRUCTION

STATUS

FINAL BID DOCUMENT

SHEET TITLE

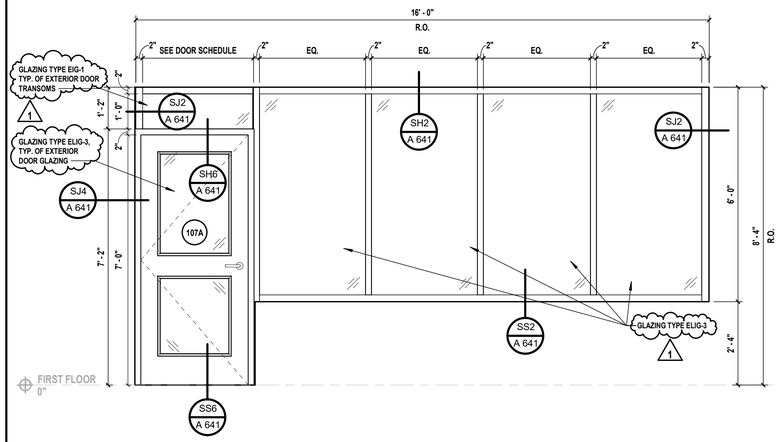
CURTAIN WALL TYPES & DETAILS

DRAWING No.

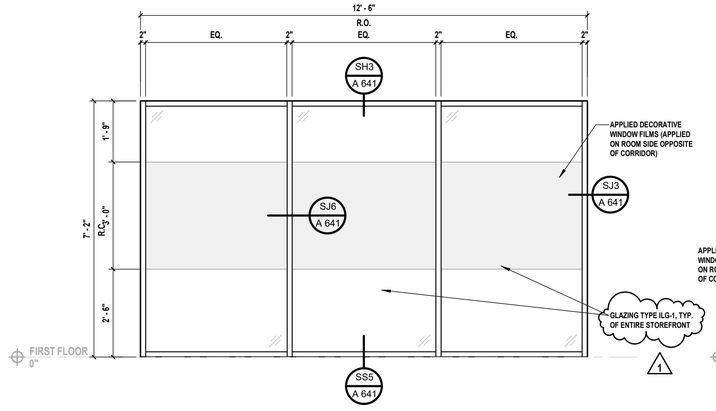
A 631.00

C:\Users\rgrodzik\Documents\TRFD2302_Central23-A_rgrodzik.rvt

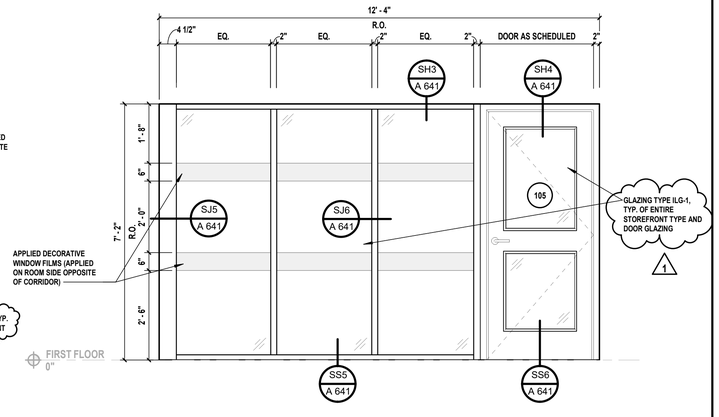
3/12/2025 5:51:53 PM



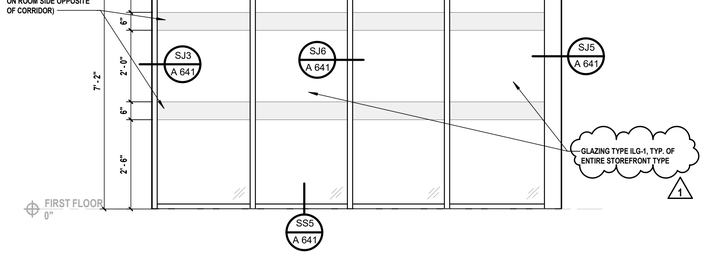
M Storefront Type M
SCALE: 1/2" = 1'-0"



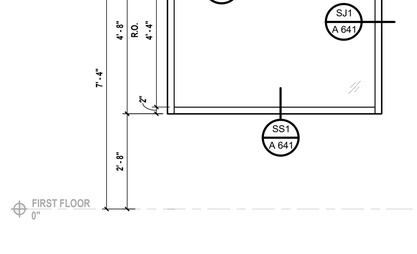
N Storefront Type N
SCALE: 1/2" = 1'-0"



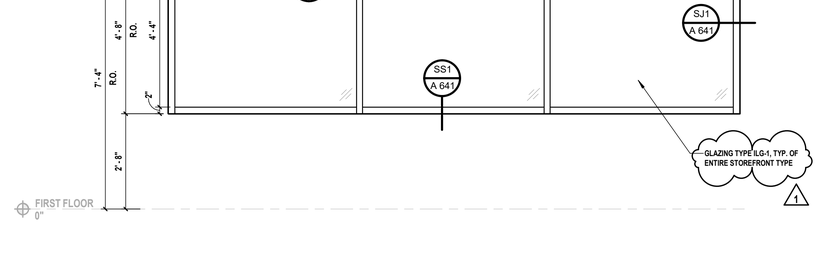
O Storefront Type O
SCALE: 1/2" = 1'-0"



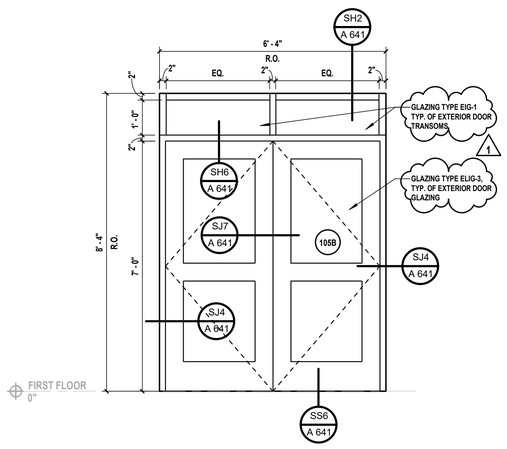
P Storefront Type P
SCALE: 1/2" = 1'-0"



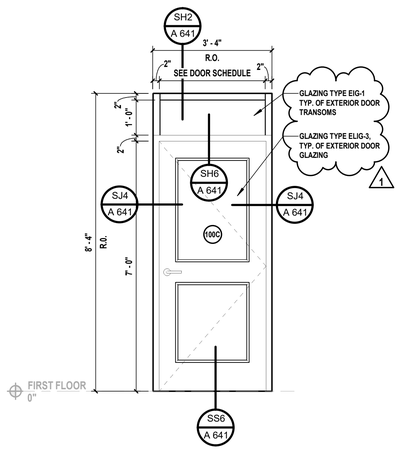
Q Storefront Type Q
SCALE: 1/2" = 1'-0"



R Storefront Type R
SCALE: 1/2" = 1'-0"



S Storefront Type S
SCALE: 1/2" = 1'-0"



T Storefront Type T
SCALE: 1/2" = 1'-0"

H 2 M architects + engineers

538 Broad Hollow Road, 4th Floor East
Melville, NY 11747
631.756.8000 • www.h2m.com
NY Architecture & Landscape Architecture: No Certificate Required
NY Engineering Certificate of Authorization No.: 0018178

CONSULTANTS:

MARK	DATE	DESCRIPTION
1	03/14/2025	ADDENDUM #1

REGISTERED ARCHITECT
PATRICK OTTO STONE
039654
STATE OF NEW YORK

10/31/2025
Exp. Date

PATRICK O. STONE, R.A.
NY PROFESSIONAL ARCHITECT Lic. No. 039654

"IN ACCORDANCE WITH ARTICLE 145, SECTION 7209 OF THE NYS EDUCATION LAW, ALTERATION OF THIS DOCUMENT EXCEPT BY A LICENSED PROFESSIONAL IS ILLEGAL."

DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
DBS/RLG	KAP/ANK	DBS	POS

PROJECT No:	DATE:	SCALE:
TRFD 2302	FEBRUARY 2025	AS SHOWN

CLIENT

THIELLS ROSEVILLE FIRE DISTRICT

NEW 26-100 FIRE HEADQUARTERS

THIELLS 26 FD

65 W RAMAPO ROAD GARNERVILLE, NY 10923

CONTRACT

CONTRACT G GENERAL CONSTRUCTION

STATUS

FINAL BID DOCUMENT

SHEET TITLE

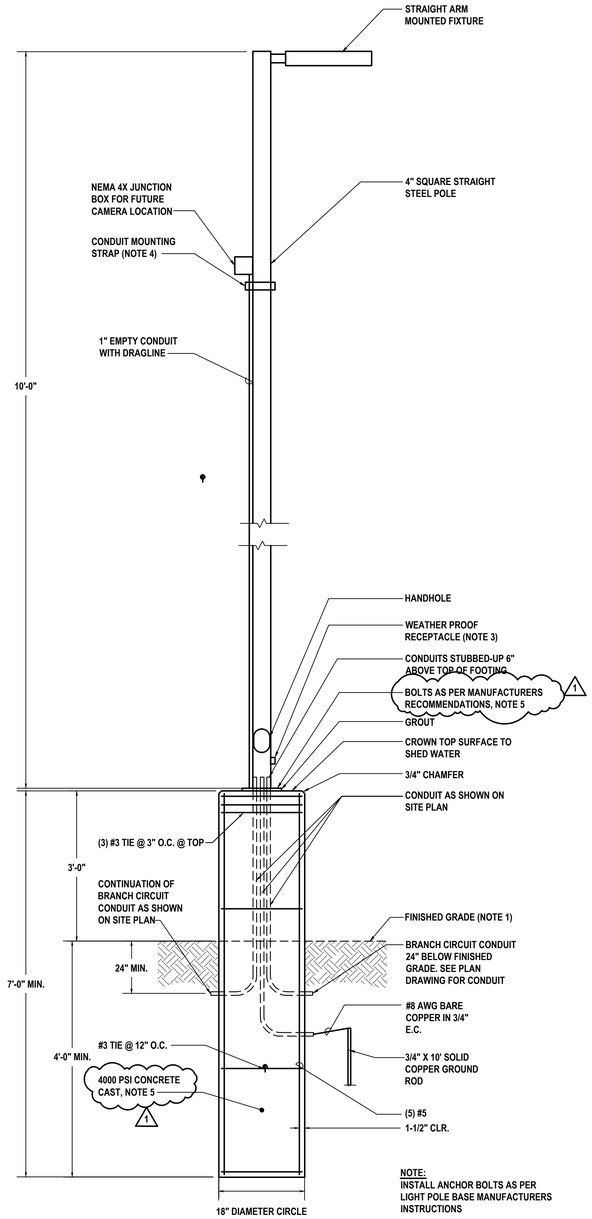
STOREFRONT TYPES

DRAWING No.

A 640.00

C:\Users\rgnotzke\Documents\TRFD2302_Central23-A_rgnotzke.rvt

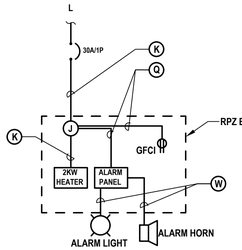
3/12/2025 5:51:58 PM



1 Single Fixture Round Straight Light Pole Detail
SCALE:NTS

NOTES:

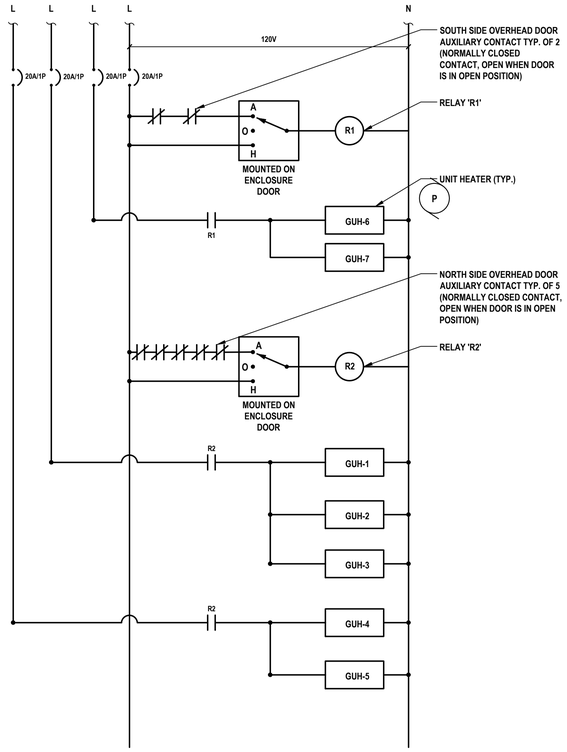
1. WHERE GRADE IS SLOPED ALONG POLE BASE, MEASUREMENT IS FROM LOWEST GRADE ELEVATION ALONG BASE TO BOTTOM OF BASE. OVERALL BASE HEIGHT WILL VARY BASED ON GRADE CHANGES.
2. CONTRACTOR TO FIELD VERIFY EXACT MOUNTING HEIGHT OF JUNCTION BOX FOR FUTURE CAMERA WITH OWNER'S SECURITY INSTALLER.
3. CONTRACTOR SHALL COORDINATE WITH OWNER FOR EXACT MOUNTING HEIGHT OF OUTDOOR RECEPTACLE WITH OWNER.
4. CONTRACTOR SHALL PROVIDE ALL REQUIRED MOUNTING HARDWARE TO SECURELY FASTEN FUTURE CCTV WIRING CONDUIT ON LIGHT POLE.
5. CONCRETE LIGHT POLE BASE BY CONTRACT 'C'. CONTRACTOR SHALL COORDINATE WITH CONTRACT 'C' FOR BOLT PATTERN AND ANCHORING DETAILS. 1



2 RPZ Enclosure Heater and Alarm Detail
SCALE: NTS

NOTES:

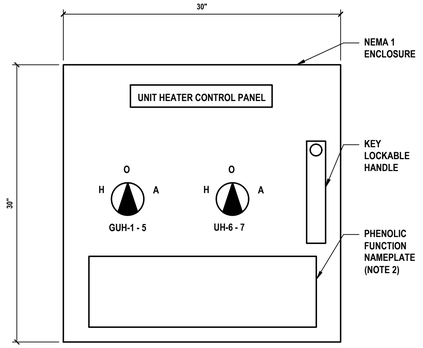
1. REFER TO SHEET E 610 FOR WIRING AND CONDUIT SCHEDULE.



3 Apparatus Bay Unit Heaters Control Panel Schematic (UHCP)
SCALE: NTS

NOTES:

1. CONTRACTOR SHALL PROVIDE ALL REQUIRED RELAYS, CONTACTORS, CONTROL TRANSFORMERS, FUSES, HARDWARE, AND ACCESSORIES REQUIRED FOR COMPLETE CONTROL SYSTEM IN NEMA 1 ENCLOSURE.



4 UHCP Elevation
SCALE: NTS

NOTES:

1. PHENOLIC NAMEPLATE:
   FOR UHCP: UNIT HEATERS SHALL BE SHUT OFF AND PREVENTED FROM RUNNING WHEN APPARATUS ROOM OVERHEAD DOORS ARE IN OPEN POSITION.

H2M architects + engineers
538 Broad Hollow Road, 4th Floor East
Melville, NY 11747
631.756.8000 • www.h2m.com
NY Architecture & Landscape Architecture: No Certificate Required
NY Engineering Certificate of Authorization No. 0018175

CONSULTANTS:

MARK	DATE	DESCRIPTION
1	03-19-25	BID ADDENDUM NO. 1

STATE OF NEW YORK · CHARLES J. STARKE · 093837 · LICENSED PROFESSIONAL ENGINEER

7/31/2025
CHARLIE J. STARKE, P.E. EXP. DATE
NY PROFESSIONAL ENGINEER Lic. No. 093837
"IN ACCORDANCE WITH ARTICLE 145, SECTION 7209 OF THE NYS EDUCATION LAW, ALTERATION OF THIS DOCUMENT EXCEPT BY LICENSE PROFESSIONAL IS ILLEGAL"

DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
VLV/INP	INP	VLV	CJS

PROJECT No.:	DATE:	SCALE:
TRFD 2302	FEBRUARY 2025	AS SHOWN

CLIENT

THIELLS ROSEVILLE FIRE DISTRICT

NEW 26-100 FIRE HEADQUARTERS

65 W RAMAPO RD GARNERVILLE, NY 10923

CONTRACT

CONTRACT E ELECTRICAL CONSTRUCTION

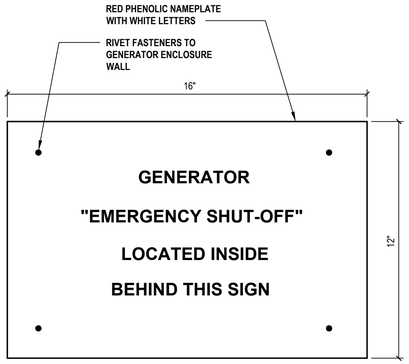
STATUS

SHEET TITLE

ELECTRICAL DETAILS SHEET NO.3

DRAWING No.

E 502.00

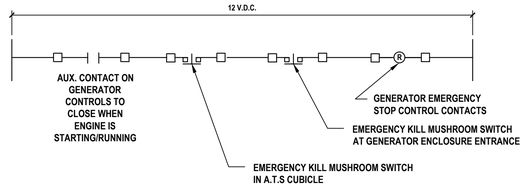


1 Emergency Shut-Off Name Plate
SCALE:NTS

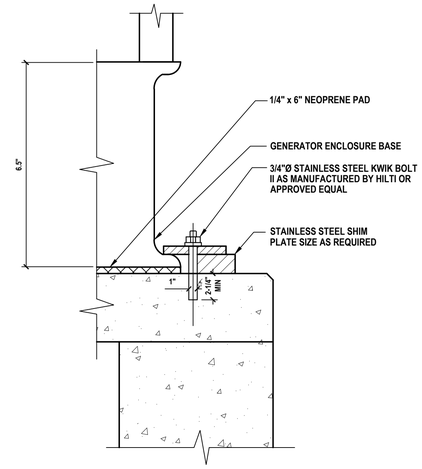
NOTE:

1. "NO SMOKING" SIGNS SHALL BE PLACED CONSPICUOUSLY AT ALL ENTRANCES TO PREMISES.

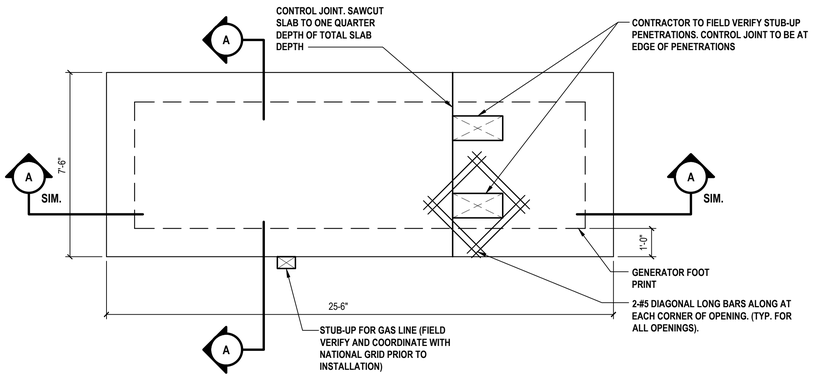
2 No Smoking Sign Detail
SCALE:NTS



3 Generator Emergency Shut Off Control Circuit
SCALE:NTS



4 Generator Enclosure Anchoring Detail
SCALE:NTS

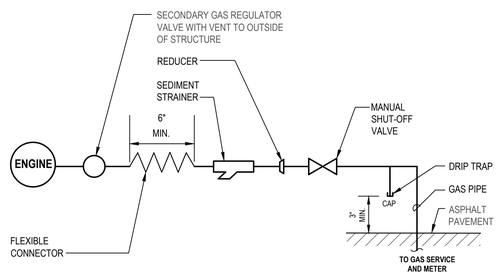


5 Generator Pad Plan
SCALE:N.T.S.

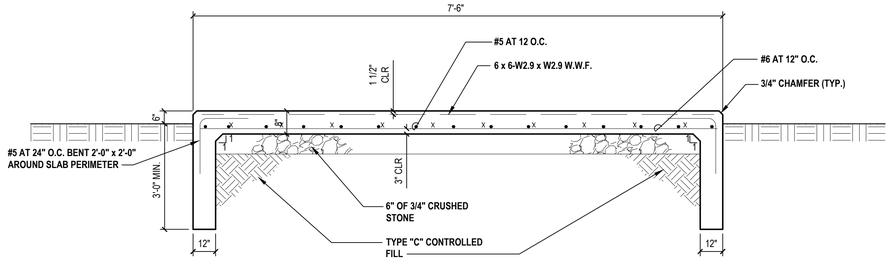
NOTES:

1. PAD DIMENSION BASED ON SPECIFIED EQUIPMENT. 1'-0" MIN ALL AROUND.
2. CONCRETE PAD AND CONCRETE SIDEWALK SHALL BE BY CONTRACT 'C'.
3. COORDINATE FINAL DIMENSIONS WITH CONTRACT 'C' AS REQUIRED.

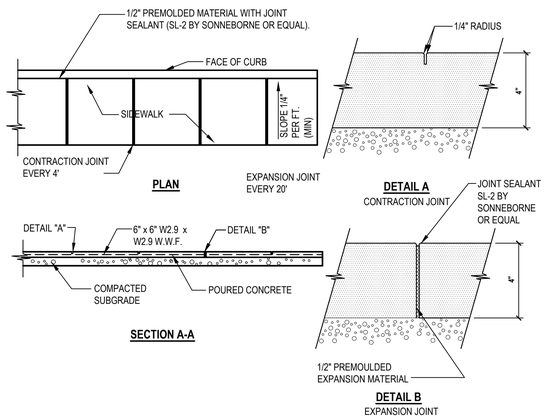
1



7 Fuel Supply Schematic
SCALE:NTS



6 Section A-A
SCALE:N.T.S.

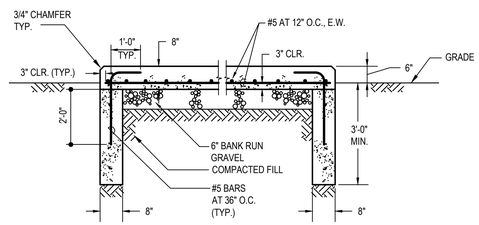


8 Concrete Sidwalk Details
SCALE:NTS

NOTES:

1. CONCRETE PAD AND CONCRETE SIDEWALK SHALL BE BY CONTRACT 'C'.
2. COORDINATE FINAL DIMENSIONS WITH CONTRACT 'C' AS REQUIRED.

1



9 Load Bank Pad Detail
SCALE:NTS

NOTES:

1. LOAD BANK CONCRETE PAD SHALL BE BY CONTRACT 'C'.
2. COORDINATE FINAL DIMENSIONS WITH CONTRACT 'C' AS REQUIRED.

1

H2M architects + engineers
538 Broad Hollow Road, 4th Floor East
Melville, NY 11747
631.756.8000 • www.h2m.com
NY Architecture & Landscape Architecture: No Certificate Required
NY Engineering Certificate of Authorization No. 0018175

CONSULTANTS:

MARK	DATE	DESCRIPTION

STATE OF NEW YORK
CHARLES J. STARKE
093837
LICENSED PROFESSIONAL ENGINEER

7/31/2025
CHARLIE J. STARKE, P.E. EXP. DATE
NY PROFESSIONAL ENGINEER Lic. No. 093837
"IN ACCORDANCE WITH ARTICLE 145, SECTION 7209 OF THE NYS EDUCATION LAW, ALTERATION OF THIS DOCUMENT EXCEPT BY LICENSE PROFESSIONAL IS ILLEGAL"

DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
VLV/INP	INP	VLV	CJS

PROJECT No.:	DATE:	SCALE:
TRFD 2302	FEBRUARY 2025	AS SHOWN

CLIENT

THIELLS ROSEVILLE FIRE DISTRICT

NEW 26-100 FIRE HEADQUARTERS

65 W RAMAPO RD GARNERVILLE, NY 10923

CONTRACT

CONTRACT E ELECTRICAL CONSTRUCTION

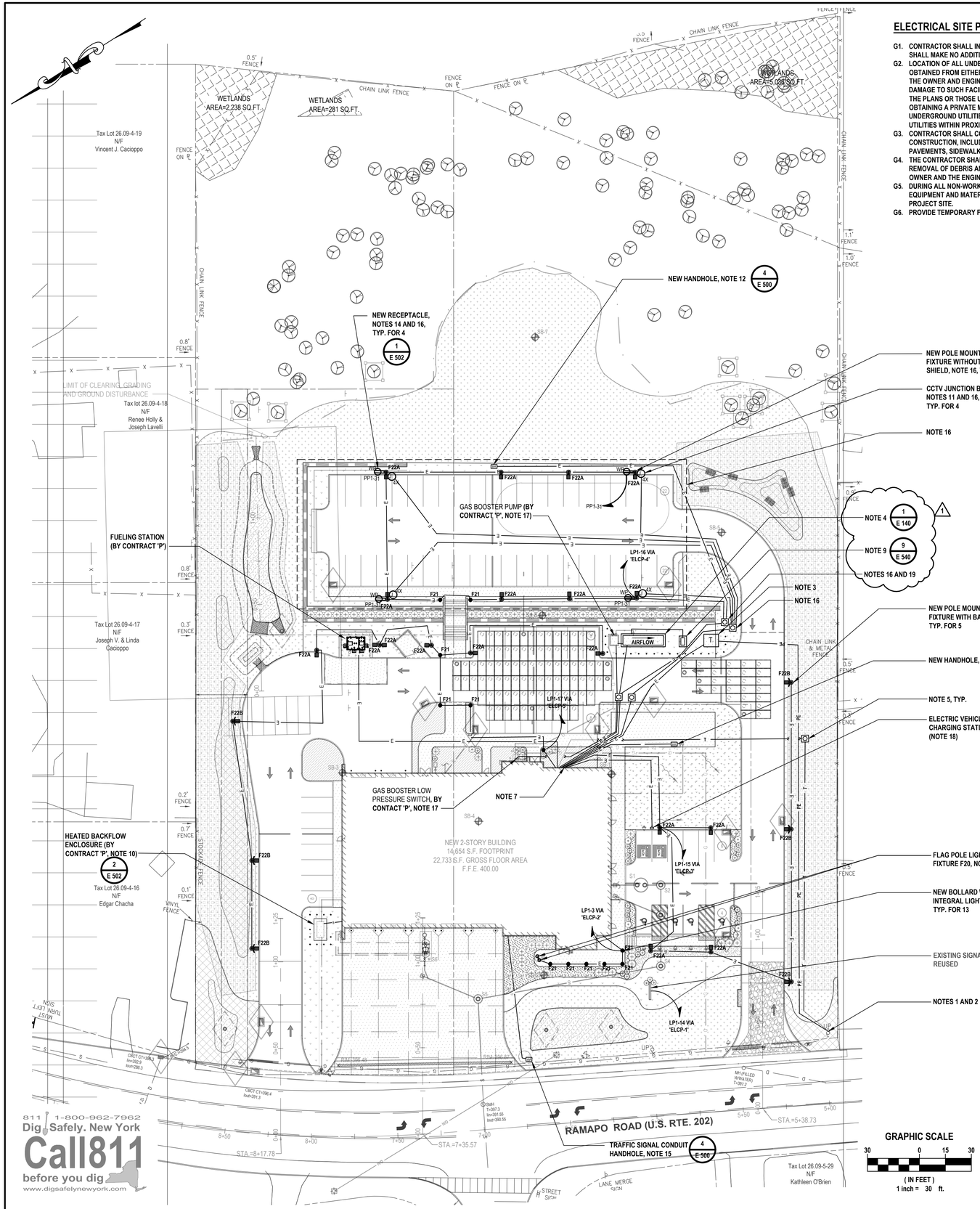
STATUS

SHEET TITLE

ELECTRICAL GENERATOR DETAILS

DRAWING No.

E 540.00



811 1-800-962-7962
Dig Safely. New York
Call811
before you dig
www.digsafelynewyork.com

ELECTRICAL SITE PLAN GENERAL NOTES:

G1. CONTRACTOR SHALL INSPECT CONSTRUCTION SITE PRIOR TO SUBMISSION OF BIDS AND SHALL MAKE NO ADDITIONAL CLAIMS REGARDING SITE CONDITIONS THEREAFTER.
G2. LOCATION OF ALL UNDERGROUND UTILITIES BOTH PUBLIC AND CUSTOMER OWNED, WERE OBTAINED FROM EITHER MAPS, SURVEYS, DRAWINGS AND RECORDS SUPPLIED BY OTHERS. THE OWNER AND ENGINEER DO NOT GUARANTEE OR ACCEPT RESPONSIBILITY FOR ANY DAMAGE TO SUCH FACILITIES DUE TO DISCREPANCIES IN LOCATION AND SIZE SHOWN ON THE PLANS OR THOSE UTILITIES NOT SHOWN. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING A PRIVATE MARKOUT COMPANY FOR DETERMINING THE LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO BEGINNING WORK. CONTRACTOR SHALL LOCATE ALL UTILITIES WITHIN PROXIMITY OF CONSTRUCTION LIMITS.
G3. CONTRACTOR SHALL COMPLETELY RESTORE ALL AREAS DISTURBED DURING CONSTRUCTION, INCLUDING BUT NOT LIMITED TO GRASS AREAS, LANDSCAPING, PAVEMENTS, SIDEWALKS, CURBING AND IN-GROUND SPRINKLER SYSTEMS.
G4. THE CONTRACTOR SHALL PERFORM DAILY CLEAN-UP OPERATIONS WHICH INCLUDE REMOVAL OF DEBRIS AND EXCESS CONSTRUCTION MATERIAL TO THE SATISFACTION OF THE OWNER AND THE ENGINEER.
G5. DURING ALL NON-WORKING HOURS, THE CONTRACTOR WILL BE REQUIRED TO STORE ALL EQUIPMENT AND MATERIALS WITHIN THE AREA DESIGNATED BY THE ENGINEER AT THE PROJECT SITE.
G6. PROVIDE TEMPORARY FENCING TO PROTECT WORK AREAS.

LEGEND

DESCRIPTION	SYMBOL
UTILITY POWER/TELEPHONE POLE	
ELECTRIC PULL BOX	
HANDHOLE	HH
TRANSFORMER	T
LIGHT POLE W/FIXTURE	
EXISTING NATURAL GAS SERVICE	NG
EXISTING SEWER SERVICE	S
EXISTING WATER SERVICE	W
EXISTING TELEPHONE SERVICE	T
NEW OVERHEAD TELEPHONE SERVICE	OHT
NEW TELEPHONE SERVICE	T
NEW UNDERGROUND TELEPHONE SERVICE	UT
EXISTING CABLE LINE	C
NEW CABLE LINE	C
NEW FIBER OPTIC LINE	FO
NEW CLOSE CIRCUIT TV LINE	CCTV
NEW SITE LIGHTING LINES	SL
EXISTING PRIMARY ELECTRIC SERVICE	PE
NEW PRIMARY ELECTRIC SERVICE	PE
NEW OVERHEAD PRIMARY ELECTRIC SERVICE	OHP
EXISTING OVERHEAD LINES	OH
NEW ELECTRICAL LINE	E
NEW OVERHEAD ELECTRICAL LINE	OHE
NEW ELECTRIC CONDUIT LINE	EC
NEW UNDERGROUND DUCKTBANK	UD

ELECTRICAL SITE PLAN KEY NOTES:

1. NEW ELECTRIC SERVICE RISER AS PER UTILITY REQUIREMENTS.
2. NEW TELECOMMUNICATIONS SERVICE RISER AS PER UTILITY REQUIREMENTS.
3. NEW TRANSFORMER PAD / PULL BOX AS PER UTILITY REQUIREMENTS.
4. NEW GENERATOR AND CONCRETE FOUNDATION.
5. NEW PULL BOX. SITE PLAN SHOWS MINIMUM REQUIRED PULL BOXES. PROVIDE ADDITIONAL PULL BOXES AS REQUIRED BY NEC AND UTILITY REQUIREMENTS.
6. NOT USED.
7. CONTRACTOR SHALL STUB ALL CONDUITS INTO BUILDINGS BELOW GRADE. NO EXTERIOR CONDUITS PERMITTED TO RUN EXPOSED ON EXTERIOR WALLS. LINK SEALS ON EXTERIOR OF CONDUITS AND DUCT SEAL ON INTERIOR CONDUIT .
8. CONTRACTOR SHALL COORDINATE WITH IN-GROUND FLAG POLE LIGHTING FIXTURES FOR EXACT PLACEMENT AND SPACING REQUIREMENT FROM THE FLAG POLE.
9. NEW PAD MOUNTED LOADBANK.
10. CONTRACTOR SHALL PROVIDE A 30A/1P CIRCUIT IN PANEL PP1B (CKT #30) AND A 30A FEED (2 #10 AWG + #10 AWG GND IN 3/4") TO POWER BACKFLOW ENCLOSURE 2000W HEATER, ALARM PANEL, AND MAINTENANCE RECEPTACLE. CONTRACTOR SHALL PROVIDE A JUNCTION BOX INSIDE THE RPZ ENCLOSURE AND WIRE ALARM PANEL, RECEPTACLE, HEATER, ALARM LIGHT, AND ALARM HORN PROVIDED BY CONTRACT 'P'. CONTRACTOR SHALL FIELD VERIFY AND COORDINATE WITH ENCLOSURE INSTALLER FOR EXACT LOCATION OF ENCLOSURE HEATER AND ALARM LIGHT AND HORN. REFER TO PLUMBING SHEET FOR RPZ ENCLOSURE DETAIL AND LOCATION OF ALARM LIGHT AND HORN.
11. ELECTRICAL ALTERNATE E-05: CONTRACTOR SHALL PROVIDE A JUNCTION BOX NEAR THE BACK OF THE LIGHT POLE FOR FUTURE CCTV CAMERA. CONTRACTOR SHALL PROVIDE A 1" EMPTY CONDUIT WITH DRAG LINE FROM THE JUNCTION BOX TO A JUNCTION BOX IN THE UTILITY ROOM. CONTRACTOR SHALL COORDINATE WITH ARCHITECT AND OWNER'S CCTV INSTALLER FOR EXACT MOUNTING LOCATION AND HEIGHT OF CCTV JUNCTION BOX AT LIGHT POLE AND UTILITY ROOM.
12. CONTRACTOR SHALL PROVIDE A NEW HANDHOLE AT THE BACK OF THE PARKING LOT AT LOCATION INDICATED FOR FUTURE CIRCUITS. CONTRACTOR SHALL PROVIDE (2) 1" EMPTY CONDUIT WITH DRAG LINE BACK TO A JUNCTION BOX IN THE UTILITY ROOM. COORDINATE WITH ARCHITECT AND OWNER FOR EXACT LOCATION OF NEW HANDHOLE.
13. CONTRACTOR SHALL PROVIDE A NEW HANDHOLE AT THE FUTURE PAVILION AREA FOR FUTURE CIRCUITS. CONTRACTOR SHALL PROVIDE (2) SETS 2 #12 AWG + #12 AWG GND IN (2) 3/4" E.C. BACK TO PANEL PP1 IN THE UTILITY ROOM. CONTRACTOR SHALL PROVIDE (2) 20A/1P CIRCUIT BREAKERS (SWITCHED OFF) IN PANEL PP1 AND PROVIDE LABEL FOR THE CIRCUIT BREAKERS. CONTRACTOR SHALL PROVIDE 10' WIRE SLACK AND CAP WIRE WITH WIRE NUTS FOR FUTURE USE. COORDINATE WITH ARCHITECT AND OWNER FOR EXACT LOCATION OF NEW HANDHOLE.
14. CONTRACTOR SHALL PROVIDE NEW RECEPTACLE WITH WEATHERPROOF ENCLOSURE AND COVER AT THE BASE OF THE POLE. CONTRACTOR SHALL COORDINATE WITH OWNER FOR EXACT MOUNTING HEIGHT OF THE RECEPTACLE. RECEPTACLE SHALL BE PART OF ELECTRICAL ALTERNATE E-05.
15. CONTRACTOR SHALL PROVIDE A NEW HANDHOLE FOR FUTURE TRAFFIC SIGNAL TIE-IN. CONTRACTOR SHALL PROVIDE A 2" EMPTY CONDUIT WITH DRAG LINE FROM THE HANDHOLE TO A JUNCTION BOX IN THE RADIO ROOM.
16. ELECTRICAL ALTERNATE E-05: ALL ELECTRICAL WORK IN THE UPPER PARKING LOT SHALL BE PART OF THIS ALTERNATE. CONTRACTOR SHALL PROVIDE DEDUCT ALTERNATE PRICING TO NOT INCLUDE LIGHTING FIXTURES, BOLLARDS, LIGHT POLES, LIGHT POLE BASES, RECEPTACLES, AND FUTURE CAMERA JUNCTION BOXES. BASE BID SCOPE SHALL INCLUDE UNDERGROUND CONDUIT FOR FUTURE TIE-IN TERMINATED IN PULLBOXES.
17. ELECTRICAL ALTERNATE E-06: ALL ELECTRICAL WORK AND COMPONENTS ASSOCIATED WITH THE INSTALLATION OF THE GAS BOOSTER PUMP INCLUDING WIRING AND CONDUIT (3 #12 AWG + #12 AWG GND IN 3/4" E.C.). CONTRACTOR SHALL INTERFACE THE LOW PRESSURE SWITCH BY THE GAS METER AND THE GENERATOR CONTROL PANEL WITH THE GAS BOOSTER CONTROL PANEL. CONTRACTOR SHALL PROVIDE ALL REQUIRED WIRING (2 #12 AWG + #12 AWG GND IN 3/4" E.C.). CONTRACTOR SHALL REFER TO PLUMBING SHEETS FOR ADDITIONAL DETAILS AND COORDINATE WITH CONTRACT 'P'.
18. ELECTRICAL ALTERNATE E-02: ALL ELECTRICAL WORK AND COMPONENTS ASSOCIATED WITH THE THE PROCUREMENT AND INSTALLATION OF FREE STANDING ELECTRIC VEHICLE CHARGING STATION (CHARGE POINT MODELCP600 AC DUAL PORT, 80 AMP) OR APPROVED EQUAL AS INDICATED IN THE CONTRACT DRAWINGS AND SPECIFICATIONS. ALL REQUIRED COMPONENTS INCLUDING ALL WIRING AND CONDUIT TO PROVIDE AN OPERATING CHARGING SYSTEM SHALL BE INCLUDED IN THE ALTERNATE PRICE. CONTRACTOR SHALL INCLUDE CAT-6 CABLE IN 3/4" E.C. FROM THE CHARGING STATION TO A JUNCTION BOX 1', ROOM WITH 20' SLACK IN THE ALTERNATE PRICE.
19. ALL SITE EXCAVATION, TRENCHING, BACKFILLING, AND ALL EQUIPMENT CONCRETE PAD/FOUNDATIONS/BASES INCLUDING TRANSFORMER, GENERATOR AND LOADBANK CONCRETE PADS SHALL BE BY CONTRACT 'C'. COORDINATE FINAL DIMENSIONS WITH CONTRACT 'C' AS REQUIRED.

1

H2M architects + engineers
538 Broad Hollow Road, 4th Floor East
Melville, NY 11747
631.756.8000 • www.h2m.com
NY Architecture & Landscape Architecture: No Certificate Required
NY Engineering Certificate of Authorization No. 0018178

CONSULTANTS:

MARK	DATE	DESCRIPTION

STATE OF NEW YORK
CHARLIE J. STARKE
093837
LICENSED PROFESSIONAL ENGINEER

7/31/2025
CHARLIE J. STARKE, P.E.
NY PROFESSIONAL ENGINEER Lic. No. 093837 EXP. DATE
"IN ACCORDANCE WITH ARTICLE 145, SECTION 7209 OF THE NYS EDUCATION LAW, ALTERATION OF THIS DOCUMENT EXCEPT BY LICENSE PROFESSIONAL IS ILLEGAL"

DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
VLV/INP	INP	VLV	CJS

PROJECT No.:	DATE:	SCALE:
TRFD 2302	FEBRUARY 2025	AS SHOWN

CLIENT
THIELLS ROSEVILLE FIRE DISTRICT

NEW 26-100 FIRE HEADQUARTERS

65 W RAMAPO RD GARNERVILLE, NY 10923

CONTRACT
CONTRACT E ELECTRICAL CONSTRUCTION

STATUS

SHEET TITLE
ELECTRICAL SITE PLAN

DRAWING No.
ES 100.01

TABLE OF CONTENTS

THIELLS ROSEVILLE FIRE DISTRICT
NEW 26-100 FIRE HEADQUARTERS
65 W RAMAPO ROAD, GARNERVILLE, New York 10923
H2M project No.: TRFD 2302

Contract G – General Construction Work
Contract P – Plumbing Construction Work
Contract M – Mechanical Construction Work
Contract E – Electrical Construction Work
Contract C – Civil/Site Work

Front End Documents

Division 00 – Procurement and Contract Requirements

Division 01 – General Requirements

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

Informational Appendices

END OF TABLE OF CONTENTS

BIDS FOR PROJECT

The Board of Fire Commissioners of the Thiells Roseville Fire District (hereafter called Owner), will receive SEALED PROPOSALS for:

THIELLS ROSEVILLE FIRE DISTRICT
NEW 26-100 FIRE HEADQUARTERS
65 W RAMAPO ROAD, GARNERVILLE, New York 10923
H2M project No.: TRFD 2302

Contract G – General Construction Work
Contract P – Plumbing Construction Work
Contract M – Mechanical Construction Work
Contract E – Electrical Construction Work
Contract C – Civil / Site Work

TIME AND PLACE

The sealed proposals are to be submitted at the:

Thiells Roseville Fire District
New 26-100 Fire Headquarters
99 W Ramapo Road
Thiells, New York 10923

See Section “Notice to Bidders” of the construction documents for all dates and times.

REQUIRED BID SUBMISSIONS

The following items must be submitted with Bid package:

1. Bid Bond - 5%
   a. Or certified check in the amount of 5% of bid.

2. Certified letter from Bonding Company, indicating that they meet the minimum requirements required by the BONDS paragraph of the Contractor’s Insurance & Bond Requirements.

3. Properly completed proposal forms (P-sheets) and list of subcontractors (SCL).

4. Certified letter that the company bidding this project has been in business under the same name for a period of five years or longer, and is not currently disbarred from bidding or working on public works projects by the New York State Department of Labor

ENVELOPES

All proposals must be submitted in a sealed envelope, with the following items clearly and legibly labeled on the exterior: Contractors name, project name as it appears above, and the contract(s) for which the bid is being submitted. Inside of this sealed envelope shall be the Proposal Sheets PA-PE fully and legibly completed. A second envelope marked "QUALIFICATIONS," shall also be inserted and shall contain all of the documents hereafter designated under REQUIRED BID SUBMISSION.

QUALIFICATIONS OF BIDDERS

In the consideration and acceptance of any proposal, the Board of Fire Commissioners shall be entitled to exercise every measure of lawful discretion evaluating the financial history and ability of the Bidder and its past performance in ventures of this or similar nature. Such data will be considered either as a material or controlling factor in the acceptance of any bid submitted.

Bidders must prove to the satisfaction of the Board of Fire Commissioners that they are reputable, reliable and responsible.

Bidders shall enclose in the envelope marked "QUALIFICATIONS" references and a notarized letter stating that a responsible representative of the Contractor's office visited the site to verify the scope of work.

Verified statement of the following items should also be provided in this envelope with respect to five (5) projects of similar nature and comparable scope on Long Island, which have been successfully completed by the bidder and have been in operation for a period of not less than one (1) year:

(a) general project description;
(b) location of work;
(c) date of award;
(d) date of completion;
(e) contract amount;
(f) client for whom work was performed; and
(g) name, title and telephone number of individuals who may be contacted for references.

In addition to the above specified information required to be submitted with the bid, the Board of Fire Commissioners may request such other information as it deems necessary to provide either an approval or disapproval of the Bidder, which may include (but not be limited to) the following:

(a) Provide a list of similar data on projects awarded to the Bidder, but not yet completed.
(b) A current financial statement of assets of the Bidder, duly signed and notarized.
(c) Names and addresses of all company officers, length of time company has been in business and field experience of officers, foremen, etc.
(d) A list of equipment available.
(e) Schedule of Values
(f) Project Schedule
(g) List of Product Manufacturers

The Board of Fire Commissioners may make any investigation it deems necessary to assure itself of the ability of the Bidder to perform the work.

The Board of Fire Commissioners reserves the right to reject any or all proposals and to accept the Proposal it deems most advantageous to the Board of Fire Commissioners, even though it may not be the lowest bid received.

VERBAL ANSWERS

The Owner, its agents, servants, employees and the Architect/Engineer shall not be responsible in any manner for **verbal** answers to inquiries made regarding the meaning of the drawings or the specifications prior to the awarding of the contract.

For information with reference to the work and its location during bid phase by prospective bidders' questions shall be submitted in writing to:

H2M architects + engineers
David Sherland, AIA
538 Broad Hollow Road, 4th Floor East
Melville, New York 11747

Phone: **(631) 756-8000 Ext. 1318**
Fax: **(631) 694-4122**
e-mail: **dsherland@h2m.com**

To be given consideration, questions must be received by Day, Month XX, 2025 at 5PM.

ADDENDA AND INTERPRETATIONS

No interpretations of the meaning of the plans, specifications or other Contract Documents will be made to any bidder orally. Every request for such interpretation should be made in writing, addressed to:

H2M architects + engineers
David Sherland, AIA
538 Broad Hollow Road, 4th Floor East
Melville, New York 11747

Phone: **(631) 756-8000 Ext. 1318**
Fax: **(631) 694-4122**
e-mail: **dsherland@h2m.com**

To be given consideration, questions must be received at least ten (10) days prior to the date fixed for the opening of bids. Any and all interpretations and any supplement instructions will be in the form of written addenda to the specifications, and will be sent by mail or faxed to each of the Contractors who have taken out the Drawings and Contract Documents.

All addenda so issued shall become part of the Contract Documents. If any addenda may materially affect the bid, the District may extend the bid date.

PRE-BID INSPECTION OF SITE

Each bidder shall conduct on-site inspections of the referenced project sites during the pre-bid walkthrough prior to submission of a bid proposal. The bidder shall acquaint himself/herself with all apparent conditions and characteristics of the facility with regard to assessment of required materials quantities, evaluation of quality of existing materials, access to the site and equipment's, location of underground utilities, clearances and all related information necessary to develop an understanding of the required scope of the work and all field conditions. Bidders must satisfy themselves by personal examination of the location of the proposed work and of the actual conditions and requirements of the work and shall not, at any time after the submission of the Proposal, dispute or complain of such estimate or assert there was any misunderstanding in regard to the depth or character or the nature of the work to be done. No consideration will be given for subsequent additional claims by the contractor of award after bidding with regard to apparent field conditions.

PRE-BID CONFERENCE

See Section “Notice to Bidders”

BIDDER TO BE FAMILIAR WITH PLANS AND REQUIREMENTS

It is the bidder’s responsibility to examine carefully the plans and specifications, proposal and the site upon which the work is to be performed. A proposal submitted shall be prima facie evidence that the bidder has made such examination and that he/she is familiar with all of the conditions and requirements.

PREPARATION OF PROPOSAL

The Proposal forms for PA-PE contained herein must be used in preparing bids. Failure to use said Proposal forms or the inclusion of bids not requested may result in rejection of the bid.

No proposal shall be received by the Owner unless the bidder tendering same is known to be skilled in work of a similar nature to that envisaged in the Proposal.

Each bidder shall fill out in ink **(in both words and figures)** and signed by an officer of the corporation in the spaces provided, lump sum bid, as the case may be, for each item in the Proposal. If there is a discrepancy between the prices in words and figures, the prices in words shall govern as unit and lump sum prices.

No bid will be considered which does not include bids for all items listed in the Proposal.

If the contract is not awarded by the Owner and/or the balance of funds due is not placed in escrow by the Owner within 90 days of receipt of bids, the obligation of the bidder under its Proposal may terminate at its option, and it shall thereupon be entitled to a refund of its certified check or release of the bid bond furnished as security with its Proposal.

NAME OF BIDDER

Each bidder must state in the Proposal its full name and business address, and the full name of every person, firm or corporation interested therein and the address of every person or firm, or president and secretary of every corporation interested with it; if no other person, firm or corporation be so interested, it must affirmatively state such fact. The Bidder must also state that the Proposal is made without any connection (directly or indirectly) with any other bidder for the work mentioned in its proposal and is (in all respects) without fraud or collusion; it has inspected the site of the work, has examined the Contract, General Conditions, Specifications, Plans, all addenda, and Information for Bidders; no person acting for or employed by the Owner is directly or indirectly interested therein, or in the supplies or work to which it relates or in any portion of the prospective profits thereof; it proposes and agrees if its proposal or bid is accepted, to execute a contract with the THIELLS ROSEVILLE FIRE DISTRICT to perform the work mentioned in the contract, plans and specifications attached; and the amount it will accept in full payment.

CERTIFIED CHECK OR BID BOND/BONDING CERTIFICATION

Each bid must be accompanied by either a certified check drawn on a solvent bank with an office in the State of New York, or a bid bond equal to five percent (5 %) of the total amount payable to the THIELLS ROSEVILLE FIRE DISTRICT This amount shall be the measure of liquidated damage sustained by the Owner as a result of the failure, negligence or refusal of the Bidder to whom the contract is awarded to execute and deliver the contract.

All bonding companies supplying bid, performance and maintenance bonds are required to provide with the bid package the following required information. Bidders failing to provide this information will not be considered. Provide a certified statement that the bonding company meets or exceeds the following:

1. A.M. Best Company (Old Wick, New Jersey) Rating of A (very good) or better.
2. (FPR) Financial Performance Rating from A.M. Best of not less than 6.
3. Bonding company must be registered to do business in New York State.
4. Listed in the U.S. Treasury Circular 570 (1994 version).
5. If underwriting limitation is less than the required performance bond amount, then the excess amount must be protected by co-insurance with a company meeting the same standards as above.

PERMITS AND REGULATIONS

Each Contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the work as drawn and specified. Each Contractor is required to observe all laws and ordinances relating to the obstructing of streets, maintaining signals, keeping open passageways and protecting them where exposed to danger, and all general ordinances affecting him/her, his/her employees, or his/her work hereunder in his/her relations to the Owner or any person. Each contractor also to obey all laws and ordinances controlling or limiting the Contractor while engaged in the prosecution of the work under this Contract.

If the Contractor observes that the drawings and specifications are at variance with laws and regulations, he/she shall promptly notify the Architect in writing and any necessary changes shall be adjusted as provided in the contract for changes in the work. If the Contractor performs any work knowing it be contrary to such laws, ordinances, rules, regulations, or specifications, or local, state or federal authorities without such notice to the Architect, he/she bear all costs arising there-from.

CONTRACTORS UNDERSTANDING

It is understood and agreed that the Contractor has, by careful examination, satisfied himself/herself as to the nature and location of the Work, and conformation of the ground, the character, quality and quantity of the materials to be encountered, the character of equipment and facilities needed preliminary to and during the prosecution of the work, the general and local conditions, and all other matters which can in any way affect the work under this contract.

No official, officer or agent of the Owner is authorized to make any representations as to the materials or workmanship involved or the conditions to be encountered and the Contractor agrees that no such statement or the evidence of any documents or plans, not a part of this contract, shall constitute any grounds for claim as to conditions encountered. No verbal agreement or conversation with any officer, agent or employee of the Owner either before or after the execution of this Contract, shall affect or modify any of the terms or obligations herein contained.

It is understood and agreed that the Contractor has informed himself/herself fully as to the conditions relating to construction and labor under which the work will be performed and agrees as far as possible to employ such methods and means in the performance of his/her work so as not to cause interruption or interference with any other Contractor.

EQUIVALENTS

In the Specifications, two or more kinds, types, brands, or manufacturers or materials are regarded as the required standard of quality and are presumed to be equal. The contractor may select one of these items or, if the contractor desires to use any kind type, brand, or manufacturer or material other than those named in the specifications, they shall indicate in writing when requested, and prior to award of contract, what kind, type, brand or manufacturer is included in the base bid for the specified item.

Submission for equivalents shall be submitted to the Architect prior to the award of the contract.

BID EVALUATION

The Owner and Architect may make such investigation as they necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish the Owner with all such additional information and data for this purpose as may be requested. The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of such bidder fails to satisfy the Owner that such bidder is properly qualified to carry out the obligations of the Contract and to complete the work contemplated therein.

NOTICE OF ACCEPTANCE

The Owner shall give notice of acceptance of a bid by mail, sent within ninety (90) days after the bids have been opened.

SIGNING OF CONTRACT

Each Bidder to whom a contract is awarded, together with the sureties offered by him/her, shall attend at the office of the Owner within ten (10) business days after the date of notification by mail of acceptance of its Proposal, and shall there sign the contract for the work and furnish the approved security in an amount equal to the full amount of the contract for its performance and maintenance.

INSURANCE

The amounts, types and clauses to be included in the insurance is required to be carried by the successful bidder and its contractors, are listed as outlined in the Contractors Insurance & Bond Requirements section of these front end documents.

WAIVER OF IMMUNITY

Attention is directed to the statement of non-collusion required by Article 5A of the "General Municipal Law of the State of New York" concerning Waiver of Immunity and included in the attached Agreement.

NON-COLLUSION

"a. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:

1. The prices in this bid have been arrived at independently without collusion, consultation, communication or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;

2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and

3. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition."

"b. A bid shall not be considered for award nor shall any award be made where items a. 1, 2 and 3 above have not been complied with; provided, however, that if in any case the bidder cannot make the foregoing certification, the bidder shall so state and shall furnish with the bid a signed statement which sets forth in detail the reasons therefore. Where items a. 1, 2 and 3 above have not been complied with, the bid shall not be considered for award nor shall any award be made unless the head of the purchasing unit of the political subdivision, public department, agency or official thereof to which the bid is made, or his/her designee, determines that such disclosure was not made for the purpose of restricting competition.

The fact that a bidder: (a) has published price lists, rates or tariffs covering items being procured, (b) has informed prospective customers of proposed or pending publication of new or revised price lists for such items, or (c) has sold the same items to other customers at the same prices being bid, does not constitute, without more, a disclosure within the meaning of Subparagraph a. 1."

"c. Any bid hereafter made to any political subdivision of the State or any public department, agency or official thereof by a corporate bidder for work or services performed or to be performed, or goods sold or to be sold; where competitive bidding is required by statute, rule, regulation or local law, and where such bid contains the certification referred to in Subdivision 1 of this section, shall be deemed to have been authorized by the Board of Directors of the bidder, and such authorization shall be deemed to include the signing and submission of the bid and the inclusion therein of the certificate as to non-collusion as the act and deed of the corporation."

RESPONSIBILITY OF BIDDER

The attention of Bidders is directed particularly to the contract provisions whereby the Contractor will be responsible for any loss or damage that may occur to the work or any part thereof during its progress and whereby the Contractor must make good any defects or faults in the work that may occur during the progress or within two (2) years after final payment is issued by the owner.

Contractor shall provide for the continuation of the Performance Bond as a Maintenance Bond for two (2) full years after date of final payment request at the full final contract price.

The work is to be performed and completed to the satisfaction of the Architect/Engineer and in substantial accordance with the specifications annexed hereto and the plans referred to therein.

LABOR RATES

Each Contractor shall pay not less than the minimum hourly wage rates on those contracts as established in accordance with Section 220 of the Labor Law as shown in the schedule.

Article 8, Section 220 of the Labor Law, as amended by Chapter 750 of the Laws of 1956, provides (among other things) that it shall be the duty of the fiscal officer to make a determination of the schedule of wages to be paid to all laborers, workers and mechanics employed on public work projects, including supplements for welfare, pension, vacation and other benefits. These supplements include hospital, surgical or medical insurance, or benefits; life insurance or death benefits; accidental death or dismemberment insurance; and pension or retirement benefits. If the amount of supplements provided by the employer is less than the total supplements shown on the wage schedule, the difference shall be paid in cash to the employee.

Article 8, Section 220 of the Labor Law, as amended by Chapter 750 of the Laws of 1956, also provides that the supplements to be provided to laborers, workers and mechanics upon public work, "...shall be in accordance with the prevailing practices in the locality..." The amount for supplements listed on the enclosed schedule does not necessarily include all types of prevailing supplements in the locality, and a future determination of the Industrial Commissioner may require the Contractor to provide additional supplements. The original payrolls or transcripts shall be preserved for three (3) years from the completion of the work on the awarded project by the Contracts. The Owner shall receive such payroll record upon completion of project.

THIELLS ROSEVILLE FIRE DISTRICT
BOARD OF FIRE COMMISSIONERS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes acoustical panels and exposed suspension systems with accessories and trims for ceilings.

B. Products furnished, but not installed under this Section, include anchors, clips, and other ceiling attachment devices.

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each exposed product and for each color and texture specified, 6 inches (150 mm) in size.

C. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.
   1. Acoustical Panel: Set of full-size Samples of each type, color, pattern, and texture.
   2. Exposed Suspension-System Members, Moldings, and Trim: Set of 6-inch (150-mm) long Samples of each type, finish, and color.

1.04 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Product Test Reports: For each acoustical panel ceiling, for tests performed by manufacturer and witnessed by a qualified testing agency.

1.05 CLOSEOUT SUBMITTALS

A. Maintenance Data: For finishes to include in maintenance manuals.

1.06 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Acoustical Ceiling Panels: Full-size panels equal to 2 percent of quantity installed.
   2. Suspension-System Components: Quantity of each exposed component including decorative moldings, equal to 2 percent of quantity installed.
   3. Hold-Down Clips: Equal to 2 percent of quantity installed.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical panels, suspension-system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

1.08 FIELD CONDITIONS

A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
   1. Pressurized Plenums: Operate ventilation system for not less than 48 hours before beginning acoustical panel ceiling installation.

1.09 WARRANTY

A. Provide manufacturer's 30-year limited systems warranty covering defects in materials and / or factory workmanship for ceiling panels and suspension systems.

B. Provide manufacturer's 10-year limited warranty covering sagging and warping defects caused by materials or factory workmanship for Humidity and Moisture-resistant ceiling systems.

C. Provide manufacturer's 1-year limited warranty covering defects in materials and / or factory workmanship for Acoustical canopy ceiling systems.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Acoustical ceiling shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

B. Surface-Burning Characteristics: Comply with ASTM E84 testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
   1. Flame-Spread Index: Comply with ASTM E1264 for Class A materials.
   2. Smoke-Developed Index: 50 or less.

2.02 ACOUSTICAL PANELS (ARMSTRONG)

A. Products:
   1. Type ACP -1
      a. Basis-of-Design Product Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
         1) Armstrong World Industries, Inc.: Kitchen Zone.
         2) Or approved equal.
      b. Color: White.
      c. LR: ASTM E1477; Not less than 0.89.
      d. NRC: ASTM C423; N/A.
      e. CAC: ASTM C1414; Not less than 33.
      f. Articulation Class (AC): ASTM E1111/E1111M; Classified with UL label.
      g. Edge/Joint Detail: Square Lay-in.
      h. Thickness: 5/8 inch (19 mm).
      i. Modular Size: 24 by 24 inches (610 by 610 mm).
      j. Durability: Scratch Resistant, Impact Resistant, Soil Resistant, Washability
      k. Humidity Resistant HumiGuard Plus with 10-year warranty

2. Type ACP - 2
   a. Basis-of-Design Product Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
      1) Armstrong World Industries, Inc.: Calla.
      2) Or approved equal.
   b. Color: White
   c. LR: ASTM E1477; Not less than 0.85.
   d. NRC: ASTM C423; Not less than 0.85.
   e. CAC: ASTM C1414; Not less than 35.
   f. Articulation Class (AC): ASTM E1111/E1111M; Not less than 170
   g. Edge/Joint Detail: Square Tegular.
   h. Thickness: 1 inch (19 mm).
   i. Modular Size: 24 by 24 inches (610 by 610 mm).
   j. Humidity Resistant HumiGuard Plus with 10-year warranty
3. Type ACP - 3
   a. Basis-of-Design Product Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
      1) Armstrong World Industries, Inc.: Cermaguard, Fine Fissured Perforated.
      2) Or approved equal.
   b. Color: White
   c. LR: ASTM E1477; Not less than 0.79.
   d. NRC: ASTM C423; Not less than 0.55.
   e. CAC: ASTM C1414; Not less than 38.
   f. Articulation Class (AC): ASTM E1111/E1111M; Not less than 170
   g. Edge/Joint Detail: Square Lay-in..
   h. Thickness: 5/8 inch (19 mm).
   i. Modular Size: 24 by 24 inches (610 by 610 mm).
   j. Humidity Resistant HumiGuard Plus with 10-year warranty

2.03 METAL SUSPENSION SYSTEMS, GENERAL

A. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

B. Metal Suspension-System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C635/C635M.
   1. High-Humidity Finish: Comply with ASTM C635/C635M requirements for "Coating Classification for Severe Environment Performance" where high-humidity finishes are indicated.

C. Attachment Devices: Size for five times the design load indicated in ASTM C635/C635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.

D. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:
   1. Zinc-Coated, Carbon-Steel Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper.
   2. Size: Select wire diameter so its stress at three times hanger design load (ASTM C635/C635M, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.135-inch- (3.5-mm-) diameter wire.

E. Hanger Rods Flat Hangers: 1/4 inch diameter, Mild steel, zinc coated or protected with rust-inhibitive paint.

F. Angle Hangers: Angles with legs not less than 7/8 inch (22 mm) wide; formed with 0.04-inch- (1-mm-) thick, galvanized-steel sheet complying with ASTM A653/A653M, G90 (Z275) coating designation; with bolted connections and 5/16-inch- (8-mm-) diameter bolts.

G. Cold Rolled Channel: 1 1/2 inch deep, 16 MSG cold rolled steel with protective zinc coating. Tie to supporting structure with 12 SWG galvanized wire ties. Install at 4'-0" o.c. maximum or as indicated on the drawings.

H. Seismic Stabilizer Bars: Manufacturer's standard perimeter stabilizers designed to accommodate seismic forces.

I. Seismic Struts: Manufacturer's standard compression struts designed to accommodate seismic forces.

J. Seismic Clips: Manufacturer's standard seismic clips designed and spaced to secure acoustical panels in place. Conform to "Code of Practices for Acoustical Ceiling System Installations" by CISCA - Ceilings & Interior Systems Contractors Association.

K. Hold-Down Clips: Provide manufacturer's standard hold-down clips (Armstrong CHDC or equal) spaced 24 inches (610 mm) o.c. on all cross tees. At exterior locations provide Exterior Hold Down Clips in size determined by the panel thickness (Armstrong EHDC or equal).

L. Retention Clips: Provide Armstrong 414 Retention Clips in Gymnasium and Activity spaces. Install as recommended by the manufacturer to secure each panel.

M. Shadow Reveal Transition Molding: Provide in size to match the adjacent grid field in 10 foot lengths, 1 1/4" height and width as determined by field grid. Armstrong 7901 for 9/16" grid and 7902 for 15/16" grid.

N. Canopy system installations shall be as recommended by the manufacturer. Panels shall not be field altered, drilled or cut.
   1. Provide a minimum of 18 inches between panels.
   2. Panels shall not be field painted.
   3. Hanging system shall not be tied to another commercial suspension system. Hang system from building structure in accordance with the manufacturer's specifications.

2.04 METAL SUSPENSION SYSTEM - 15/16 GRID

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Basis-of-Design Product Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
   1. Armstrong World Industries, Inc.: 15/16 Prelude and 15/16 Prelude XL.
   2. CertainTeed Corp.
   3. Chicago Metallic Corporation.

C. Wide-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; prepainted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653/A 653M, not less than G30 (Z90) coating designation; with prefinished 15/16-inch (24 mm) wide metal caps on flanges.
   1. Structural Classification: Heavy-duty system.
   2. End Condition of Cross Runners: butt-edge type.
   3. Face Design: Flat, flush.
   4. Grid and Cap Material: Hot-dip galvanized steel with Aluminum cap.

5. Cap Finish:
    a. White for acoustical panel installations.
    b. Color as selected by the Architect for the 360 Painted Grid system.

D. Suspended Ceiling Grid Moldings: StyleStix TM - Rigid PVC; Sag, mold, mildew and bacteria resistant; snap-on grid and perimeter moldings (Items #1310, 1311 and 1312) in lengths required. System connects to a standard 15/16" grid suspension system with wall molding profile. The StyleStix system shall have the following physical characteristics:
    1. Dimensions: 1 1/2 inch wide x 3/4 inch deep x 72 inch long (#1310)
    2. Sag Resistance: HumiGuard Plus.
    3. Fire Rating: Class A
    4. Anti-microbial: Mold, Mildew and Bacteria resistant
    5. Durability: Soil, scratch and impact resistant
    6. Material: PVC
    7. Finish: White, paintable surface.
    8. Warranty: Limited Lifetime manufacturer's warranty.

2.05 METAL EDGE MOLDINGS AND TRIM

A. Basis-of-Design Product : Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
    1. Armstrong World Industries, Inc. 15/16 inch edge Angles, Moldings and Trims compatible with the grid specified. Provide gasketed CLEAN ROOM Edge Moldings and Trim where CLEAN ROOM grids are specified.
    2. Chicago Metallic Corporation.
    3. USG Interiors, Inc.; Subsidiary of USG Corporation.

B. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension-system runners.
    1. Provide manufacturer's standard edge moldings that fit acoustical panel edge details and suspension systems indicated and that match width and configuration of exposed runners unless otherwise indicated.
    2. For lay-in panels with reveal edge details, provide stepped edge molding that forms reveal of same depth and width as that formed between edge of panel and flange at exposed suspension member.
    3. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.

2.06 ACOUSTICAL SEALANT

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. Acoustical Sealant for Exposed and Concealed Joints
        a. Pecora Corporation ; AC-20 FTR Acoustical and Insulation Sealant.
        b. USG Corporation: SHEETROCK Acoustical Sealant.

B. Acoustical Sealant: Manufacturer's standard sealant complying with ASTM C834 and effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
    1. Exposed and Concealed Joints: Nonsag, paintable, nonstaining latex sealant.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.

B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.

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

3.02 PREPARATION

A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

3.03 INSTALLATION

A. General: Install acoustical panel ceilings to comply with ASTM C636/C636M and seismic design requirements indicated, according to manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."

B. Suspend ceiling hangers from building's structural members and as follows:
   1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
   2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
   3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
   4. Secure wire hangers to ceiling-suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
   5. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both the structure to which hangers are attached and the type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
   6. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
   7. Do not attach hangers to steel deck tabs.
   8. Do not attach hangers to steel roof deck. Attach hangers to structural members.
   9. Space hangers not more than 48 inches (1200 mm) o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches (200 mm) from ends of each member.
   10. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or post-installed anchors.

D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
   1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
   2. Screw attach moldings to substrate at intervals not more than 16 inches (400 mm) o.c. and not more than 3 inches (75 mm) from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet (3.2 mm in 3.6 m). Miter corners accurately and connect securely.
   3. Do not use exposed fasteners, including pop rivets, on moldings and trim.

E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

F. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
   1. Arrange directionally patterned acoustical panels as follows:
      a. As indicated on reflected ceiling plans.
      b. Install panels with pattern running in one direction parallel to short axis of space.
   2. For reveal-edged panels on suspension-system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
   3. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.
   4. Install hold-down clips in areas indicated, in areas required by authorities having jurisdiction, and for fire-resistance ratings; space as recommended by panel manufacturer's written instructions unless otherwise indicated.

3.04 FIELD QUALITY CONTROL

A. Testing Agency: a qualified testing agency to perform tests and inspections and prepare test reports.

B. Perform the following tests and inspections of completed installations of acoustical panel ceiling hangers and anchors and fasteners in successive stages. Do not proceed with installations of acoustical panel ceiling hangers for the next area until test results for previously completed installations show compliance with requirements.
   1. Extent of Each Test Area: When installation of ceiling suspension systems on each floor has reached 20 percent completion but no panels have been installed.
      a. Within each test area, testing agency will select one of every 10 power-actuated fasteners and post-installed anchors used to attach hangers to concrete and will test them for 200 lbf (890 N) of tension; it will also select one of every two post-installed anchors used to attach bracing wires to concrete and will test them for 440 lbf (1957 N) of tension.
      b. When testing discovers fasteners and anchors that do not comply with requirements, testing agency will test those anchors not previously tested until 20 pass consecutively and then will resume initial testing frequency.

C. Acoustical panel ceiling hangers and anchors and fasteners will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports.

3.05 CLEANING

A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Interior manual roller shades.

1.02 RELATED REQUIREMENTS

A. Section 061000 - Rough Carpentry: Concealed wood blocking for attachment of headrail brackets.

B. Section 092116 - Gypsum Board Assemblies: Substrate for window shade systems.

C. Section 095100 - Acoustical Ceilings: Shade Pockets, pocket closures and accessories.

1.03 REFERENCE STANDARDS

A. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).

B. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films; 2023, with Errata.

C. WCMA A100.1 - Standard for Safety of Window Covering Products; 2022.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week prior to commencing work related to products of this section; require attendance of all affected installers.

B. Sequencing:
   1. Do not fabricate shades until field dimensions for each opening have been taken.
   2. Do not install shades until final surface finishes and painting are complete.

1.05 SUBMITTALS

A. Product Data: Provide manufacturer's standard catalog pages and data sheets including materials, finishes, fabrication details, dimensions, profiles, mounting requirements, and accessories.

B. Shop Drawings: Include shade schedule indicating size, location and keys to details, head, jamb and sill details, mounting dimension requirements for each product and condition, and operation direction.

C. Selection Samples: Include fabric samples in full range of available colors and patterns.

D. Verification Samples:
   1. Minimum size 6 inches square, representing actual materials, color and pattern of each shade type material.

E. Warranty: Submit sample of manufacturer's warranty and documentation of final executed warranty completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.

B. Installer Qualifications: Company specializing in performing work of this type with minimum 5 years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver shades in manufacturer's unopened packaging, labeled to identify each shade for each opening.

B. Handle and store shades in accordance with manufacturer's recommendations.

1.08 FIELD CONDITIONS

A. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.09 WARRANTY

A. See Section 017800 - Closeout Submittals, for additional warranty requirements.

B. Provide manufacturer's warranty from Date of Substantial Completion, covering the following:
   1. Shade Hardware: One year.
   2. Fabric: One year.
   3. Aluminum and Steel Coatings: One year.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Manually Operated, Roller Shades:
   1. Mecho Systems Single and Dual Roller type shade systems.
      a. MechoShade Systems LLC; Mecho/5x: www.mechoshade.com/#sle.
   2. Architect approved equivalent

2.02 ROLLER SHADES

A. General:
   1. Provide shade system components that are capable of being removed or adjusted without removing mounted shade brackets or cassette support channel.
   2. Provide shade system that operates smoothly when shades are raised or lowered.

B. Roller Shades Type RS-1 - Basis of Design: MechoShade Systems LLC; Mecho/5x System; www.mechoshade.com/#sle.
   1. Description: Single roller, manually operated fabric window shades.
      a. Drop Position: Regular roll.
      b. Mounting: Ceiling mounted.
      c. Size: As indicated on drawings.
      d. Fabric: As indicated under Shade Fabric article.
   2. Brackets and Mounting Hardware: As recommended by manufacturer for mounting indicated and to accommodate shade fabric roll-up size and weight.
      a. Material: Steel, 1/8 inch (3 mm) thick.

b. Multiple Shade Band Operation: Provide hardware as necessary to operate more than one shade band using a single clutch operator.

3. Roller Tubes:
   a. Material: Extruded aluminum.
   b. Size: As recommended by manufacturer; selected for suitability for installation conditions, span, and weight of shades.
   c. Fabric Attachment: Utilize extruded channel in tube to accept vinyl spline welded to fabric edge. Shade band to be removable and replaceable without removing roller tube from brackets or inserting spline from the side of the roller tube.
   d. Roller tubes to be capable of being removed and reinstalled without affecting roller shade limit adjustments.
4. Hembars: Designed to maintain bottom of shade straight and flat.
   a. Style: Full wrap fabric covered bottom bar, flat profile with heat sealed closed ends.
5. Clutch Operator: Manufacturer's standard material and design integrated with bracket/brake assembly.
   a. Provide a permanently lubricated brake assembly mounted on a oil-impregnated hub with wrapped spring clutch.
   b. Brake must withstand minimum pull force of 50 pounds (22.7 kg) in the stopped position.
   c. Mount clutch/brake assembly on the support brackets, fully independent of the roller tube components.
6. Drive Chain: Continuous loop stainless steel beaded ball chain, 100 pound (45 kg) minimum breaking strength. Provide upper and lower limit stops.
   a. Chain Retainer: Chain tensioning device complying with WCMA A100.1.
7. Accessories:
   a. Fascia: Removable extruded aluminum fascia, size as required to conceal shade mounting, attachable to brackets without exposed fasteners; baked enamel finish.
      1) Fascia to be capable of installation across two or more shade bands in one piece.
      2) Color: Quaker Bronze.
      3) Profile: Square.
      4) Configuration: Continuous, fascia extends past continuous bracket.

2.03 SHADE FABRIC

A. Basis of Design: Shade fabric as manufactured by Mecho.
   1. Solar Shadecloths:
      a. Fabric: EcoVeil Screens: 1350 series. 5 percent open, 2 by 2 dense basket-weave pattern.
         1) Locations: All exterior window locations within project, Curtain Wall 'L', and exterior Storefront Type 'M'.

2.04 ROLLER SHADE FABRICATION

A. Field measure finished openings prior to ordering or fabrication.

B. Dimensional Tolerances: As recommended in writing by manufacturer.
   1. Vertical Dimensions: Fill openings from head to sill with 1/2 inch (13 mm) space between bottom bar and window stool.
   2. Horizontal Dimensions - Inside Mounting: Provide symmetrical light gaps on both sides of shade not to exceed 3/4 inch (19.05 mm) total.

C. At openings requiring continuous multiple shade units with separate rollers, locate roller joints at window mullion centers; butt rollers end-to-end.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine finished openings for deficiencies that may preclude satisfactory installation.

B. If substrate preparation is the responsibility of another installer, notify Architect/Engineer of unsatisfactory preparation before proceeding.

C. Start of installation shall be considered acceptance of substrates.

3.02 PREPARATION

A. Prepare surfaces using methods recommended by manufacturer for achieving best result for substrate under the project conditions.

B. Coordinate with window installation and placement of concealed blocking to support shades.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions and approved shop drawings, using mounting devices as indicated.

B. Replace shades that exceed specified dimensional tolerances at no extra cost to Owner.

C. Adjust level, projection and shade centering from mounting bracket. Verify there is no telescoping of shade fabric. Ensure smooth shade operation.

3.04 CLEANING

A. Clean soiled shades and exposed components as recommended by manufacturer.

B. Replace shades that cannot be cleaned to "like new" condition.

3.05 PROTECTION

A. Protect installed products from subsequent construction operations.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

PART 1: GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:
   1. Piping materials and installation instructions common to most piping systems.
   2. Mechanical sleeve seals.
   3. Sleeves.
   4. Escutcheons.
   5. Grout.
   6. Fire-suppression equipment and piping demolition.
   7. Equipment installation requirements common to equipment sections.
   8. Painting and finishing.
   9. Concrete bases.
   10. Supports and anchorages.

1.03 DEFINITIONS

A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe chases, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.

B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.

C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in chases.

E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

1.04 SUBMITTALS

A. Product Data: For the following:
   1. Mechanical sleeve seals.
   2. Escutcheons.

B. Welding certificates.

1.05 QUALITY ASSURANCE

A. Steel Support Welding: Qualify processes and operators according to AWS D1.1, "Structural Welding Code--Steel."

B. Steel Pipe Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."
   1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."

2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.

C. Electrical Characteristics for Fire-Suppression Equipment: Equipment of higher electrical characteristics may be furnished provided such proposed equipment is approved in writing and connecting electrical services, circuit breakers, and conduit sizes are appropriately modified. If minimum energy ratings or efficiencies are specified, equipment shall comply with requirements.

1.06 DELIVERY, STORAGE, AND HANDLING

A. A. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.

1.07 COORDINATION

A. Arrange for pipe spaces, chases, slots, and openings in building structure during progress of construction, to allow for plumbing installations.

B. Coordinate installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components as they are constructed.

C. Coordinate requirements for access panels and doors for plumbing items requiring access that are concealed behind finished surfaces. Access panels and doors are specified in Division 08 Section "Access Doors and Frames."

D. The fire protection contractor shall coordinate all work and routing with other trades prior to installation of system to ensure proper sequencing of work without delaying or impairing other trades in their performance of work. The fire protection contractor shall schedule work to meet the Project schedule. The fire protection contractor shall remove and reinstall any and all piping and sprinkler heads that are in conflict with other mechanical trades at the fire protection contractor’s expense and at no additional cost to the owner.

E. The fire protection contractor shall avoid all routing of sprinkler mains thru stairwells unless absolutely necessary and prior approved by the architect.

F. The fire protection contractor shall follow the routing of new and/or existing piping with the space, chases, soffits, etc to avoid any exposed piping or routing conflicts.

G. The fire protection contractor shall coordinate all routing of mains thru stairwells, clear-stories, open vestibules, etc with the architect prior to installation. If routing is not approved prior to installation the fire protection contractor shall be responsible for all cost related to moving the piping.

H. The fire protection contractor shall coordinate all routing of exposed mains on finished walls as to route from one elevation to another due to ceiling heights, structure, etc. The contractor shall clearly document routing on plans and meet with architect on site to verify routing prior to installation. If exposed piping routing is not approved prior to installation the fire protection contractor shall be
   1. responsible for all cost related to moving the piping.

I. The plans do not give exact details as to elevations of lines, exact locations, etc., and do not show all the offsets, control lines, pilot lines and other location details. Carefully lay out work at the site to conform to the Architectural and Structural conditions, to provide proper grading of lines, to avoid all obstructions, to conform to the details of installation supplied by the

manufacturers of the equipment to be installed, and thereby to provide an integrated satisfactory operation installation

J. If a discrepancy is discovered between engineering and architectural Drawings/Specifications, whether with respect to a significant variance between location, new/existing areas of required coverage, variation in quantity, or violation of code requirements, the contractor shall figure the work based on the most stringent requirements to complete the installation and obtain clarification from the Architect before installation.

1.08 INTERPRETATION OF PLANS

A. In general, the Drawings are to scale. However, to determine exact locations of walls and partitions, the Contractor shall consult the architectural and/or structural Drawings which are dimensioned. Drawings shall not take precedence over field measurements.

B. Drawings are diagrammatic only. They are intended to indicate size and/or capacity where stipulated, approximate location and/or direction, and approximate general arrangement of one phase of work to another, but not the exact detail of construction. All work shall be constructed from field measurements taken at the site. This shall include all rises, drops and offsets necessary to avoid structural members or equipment and materials installed by other trades. The contractor shall coordinate the ductwork and piping layout before construction. No additional costs will be allowed for piping and ductwork fabrications without field verification of available space. If it is found, before installation, that a more convenient, suitable or workable arrangement of any or all phases of construction would result by altering the arrangement indicated on the Drawings, the architect/engineer may require the contractor to change the arrangement of his work without additional cost to the owner.

C. The drawings and specifications are intended to supplement each other. Any items shown on the drawings and not mentioned in the specifications, or vice versa, shall be executed the same as if mentioned and shown.

D. The greatest quantity or more expensive work shall govern where there is a conflict noted anywhere on the drawings and/or specifications.

1.09 COORDINATION DRAWINGS

A. Review contract documents and prepare coordination model drawings as an informational supplemental submittal in accordance with Division 1, 21, 22, and 23 requirements. Provide drawings of all areas of the project. Architectural models of the building will be made available upon request. Detailed mechanical models will not be made available. Facilitate coordination meetings and revise drawings as required to resolve work conflicts.

B. All contractors (including steel, precast concrete, fire protection, lighting, plumbing, piping, and building sound systems) are required to attend a minimum of (3) three coordination meetings on site to resolve any coordination issues prior to start of construction.

C. If the coordination drawings are not complete and/or coordinated prior to the work being started no extra cost shall be incurred by the owner due to coordination issue and it shall be the responsibility of the contractors to make the necessary modifications to the system to meet the requirements. All modifications shall be approved by the engineer/architect but at the cost to the contractor.

D. The composite model drawings of all trades shall detail all structural building elements, mechanical equipment, and work of other trades. Indicate locations where space is limited for installation, access for service, and where sequencing and coordination of installations are of importance to the efficient flow of work. The composite drawings shall include at a minimum the

following. Where required for clarity multiple composite drawings may have to be submitted for each area.

1. Clearances for maintaining ceiling heights.
2. Clearances for installation of material and equipment for all trades.
3. Clearances for installing and maintaining insulation.
4. Clearances for servicing and maintaining equipment, including tube removal, filter removal, and space for equipment disassembly required for periodic maintenance.
5. Equipment connections and support details.
6. Penetrations thru block walls and Pre-cast walls.
7. Exterior wall and foundation penetrations.
8. Fire-rated wall and floor penetrations.
9. Sizes and locations of required concrete pads and bases.
10. Valve stem movement.
11. Dimensional locations of pipe sleeves passing through floor/roof slabs.
12. Locations of wall and ceiling access panels where required for access to mechanical equipment.
13. Reflected ceiling plans to integrate installations of light fixtures, grilles, registers, and diffusers, sprinklers, communication systems, and other ceiling mounted components.
14. Both new and existing structural elements.

1.10 COST BREAKDOWN

A. Submit a cost breakdown for each claim according to General Conditions of the Contract. Include project name, location, Architect/Engineer, Contractor and date.
   1. List the cost breakdown for labor and material separately and include a total.
   2. Breakout and detail the cost according to specification sections.

1.11 RECORD DOCUMENTS

A. Prepare record documents in accordance with the requirements in Division 1 Section "Project Record Documents." In addition to the requirements specified in Division 1, refer to specific sections for additional record documentation.

1.12 MAINTENANCE MANUALS

A. Prepare maintenance manuals in accordance with Division 1 Section "Operating, Maintenance, and Warranty Data". Submit copies for review by Architect/Engineer. In addition to the requirements specified in Division 1, include the following information:
   1. Descriptive summary of function, normal system operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts.
   2. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.
   3. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.
   4. Servicing instructions and lubrication charts and schedules.
   5. Warranty information for all mechanical items shall be included in one tabbed section.

1.13 FIRE SAFETY PRECAUTIONS

A. The Contractors shall exercise extreme care to maintain and exercise adequate fire safety precautions throughout the work. This shall include providing sufficient fire fighting devices, watchmen, standby helpers or other precautions during construction, in use of temporary heat, welding, brazing, sweating, testing or other phases of work.

B. At all times, access shall be maintained for fire department trucks to the building.

C. All welding brazing, cutting and sweating operations performed in vicinity of or accessible to combustible materials shall be adequately protected to make certain that sparks or hot slag does not reach the combustible material and start a fire.

D. All glass, glazed materials and other finish, in the vicinity of welding, brazing and cutting, shall be masked by the Contractor performing the welding work.

E. When necessary to do cutting, welding, brazing, sweating and similar work in vicinity of wood, in shafts, or vicinity of any combustible material (and the combustible material cannot be removed), the materials shall be adequately protected with fire resistant blankets or similar approved coverings. In addition, a helper shall be stationed nearby with proper fire extinguishers (provided by the Contractor performing the work) to guard against sparks and fire.

F. Whenever combustible materials have been exposed to sparks, molten metal, hot slag or splatter, a person shall be kept at the place of work to make sure the smoldering fires have not been started. Whenever cutting or welding operations are carried on in a vertical pipe shaft, a person to act as a fireguard shall be employed to examine all floors below the point of cutting or welding. This fireguard shall be kept on duty after completion of work to guard against fires and shall examine each level after this time, prior to leaving. There shall be no exceptions to this requirement and failure to comply will be construed as negligence.

1.14 PERSONAL SAFETY REQUIREMENTS

A. A. The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions required in connection with his work, including regulations of the Occupational Safety and Health Administration (OSHA) and other governing agencies.

PART 2: PRODUCTS

2.01 PIPE, TUBE, AND FITTINGS

A. Refer to individual Division 21 piping Sections for pipe, tube, and fitting materials and joining methods.

B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

2.02 JOINING MATERIALS

A. Refer to individual Division 21 piping Sections for special joining materials not listed below.

B. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.
   1. ASME B16.21, nonmetallic, flat, asbestos-free, 1/8-inch maximum thickness unless thickness or specific material is indicated.
      a. Full-Face Type: For flat-face, Class 125, cast-iron and cast-bronze flanges.
      b. Narrow-Face Type: For raised-face, Class 250, cast-iron and steel flanges.
   2. AWWA C110, rubber, flat face, 1/8 inch thick, unless otherwise indicated; and full-face or ring type, unless otherwise indicated.

C. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.

D. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.

E. Brazing Filler Metals: AWS A5.8, BCuP Series, copper-phosphorus alloys for general-duty brazing, unless otherwise indicated; and AWS A5.8, BAg1, silver alloy for refrigerant piping, unless otherwise indicated.

F. Welding Filler Metals: Comply with AWS D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

2.03 MECHANICAL SLEEVE SEALS

A. Description: Modular sealing element unit, designed for field assembly, to fill annular space between pipe and sleeve.
   1. Sealing Elements: EPDM interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
   2. Pressure Plates: Stainless steel. Include two for each sealing element.
   3. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.04 SLEEVES

A. Galvanized-Steel Sheet: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.

B. Steel Pipe: ASTM A 53, Type E, Grade B, Schedule 40, galvanized, plain ends.

C. Cast Iron: Cast or fabricated "wall pipe" equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.

D. Stack Sleeve Fittings: Manufactured, cast-iron sleeve with integral clamping flange. Include clamping ring and bolts and nuts for membrane flashing.

2.05 ESCUTCHEONS

A. Description: Manufactured wall and ceiling escutcheons and floor plates, with an ID to closely fit around pipe, tube, and insulation of insulated piping and an OD that completely covers opening.

2.06 GROUT

A. Description: ASTM C 1107, Grade B, nonshrink and nonmetallic, dry hydraulic-cement grout.
   1. Characteristics: Post-hardening, volume-adjusting, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications
   2. Design Mix: 5000-psi, 28-day compressive strength.
   3. Packaging: Premixed and factory packaged.

PART 3: EXECUTION

3.01 PIPING SYSTEMS - COMMON REQUIREMENTS

A. Install piping according to the following requirements and Division 21 Sections specifying piping systems.

B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.

C. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.

D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

F. Install piping to permit valve servicing.

G. Install piping at indicated slopes.

H. Install piping free of sags and bends.

I. Install fittings for changes in direction and branch connections.

J. Install piping to allow application of insulation.

K. Select system components with pressure rating equal to or greater than system operating pressure.

L. Install escutcheons for penetrations of walls, ceilings, and floors.

M. Sleeves are not required for core-drilled holes.

N. Install sleeves for pipes passing through concrete and masonry walls, gypsum-board partitions, and concrete floor and roof slabs.
   1. Cut sleeves to length for mounting flush with both surfaces.
      a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches above finished floor level. Extend cast-iron sleeve fittings below floor slab as required to secure clamping ring if ring is specified.
   2. Install sleeves in new walls and slabs as new walls and slabs are constructed.
   3. Install sleeves that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation. Use the following sleeve materials:
      a. Steel Sheet Sleeves: For pipes NPS 6 and larger, penetrating gypsum-board partitions.
      b. Stack Sleeve Fittings: For pipes penetrating floors with membrane waterproofing. Secure flashing between clamping flanges. Install section of cast-iron soil pipe to extend sleeve to 2 inches above finished floor level. Refer to Division 07 Section "Sheet Metal Flashing and Trim" for flashing.
   4. Except for underground wall penetrations, seal annular space between sleeve and pipe or pipe insulation, using joint sealants appropriate for size, depth, and location of joint. Refer to Division 07 Section "Joint Sealants" for materials and installation.

O. Aboveground, Exterior-Wall Pipe Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
   1. Install steel pipe for sleeves smaller than 6 inches in diameter.
   2. Install cast-iron "wall pipes" for sleeves 6 inches and larger in diameter.
   3. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

P. Underground, Exterior-Wall Pipe Penetrations: Install cast-iron "wall pipes" for sleeves. Seal pipe penetrations using mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
   1. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

Q. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Refer to Division 07 Section "Penetration Firestopping" for materials.

R. Verify final equipment locations for roughing-in.

S. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.

3.02 PIPING JOINT CONSTRUCTION

A. Join pipe and fittings according to the following requirements and Division 22 Sections specifying piping systems.

B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.

E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.

F. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
   1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
   2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

G. Welded Joints: Construct joints according to AWS D10.12, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.

H. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

3.03 PAINTING

A. Painting of fire-suppression systems, equipment, and components is specified in Division 09 Sections "Interior Painting" and "Exterior Painting."

B. Damage and Touchup: Repair marred and damaged factory-painted finishes with materials and procedures to match original factory finish.

3.04 CONCRETE BASES

A. Concrete Bases: Anchor equipment to concrete base according to equipment manufacturer's written instructions and according to seismic codes at Project.
   1. Construct concrete bases of dimensions indicated, but not less than 4 inches larger in both directions than supported unit.
   2. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of the base.
   3. Install epoxy-coated anchor bolts for supported equipment that extend through concrete base, and anchor into structural concrete floor.
   4. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
   5. Install anchor bolts to elevations required for proper attachment to supported equipment.
   6. Install anchor bolts according to anchor-bolt manufacturer's written instructions.
   7. Use 3000-psi, 28-day compressive-strength concrete and reinforcement as specified in Division 03 Section "Cast-in-Place Concrete."

3.05 ERECTION OF METAL SUPPORTS AND ANCHORAGES

A. Refer to Division 05 Section "Metal Fabrications" for structural steel.

B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor fire-suppression materials and equipment.

C. Field Welding: Comply with AWS D1.1.

3.06 ERECTION OF WOOD SUPPORTS AND ANCHORAGES

A. Cut, fit, and place wood grounds, nailers, blocking, and anchorages to support, and anchor fire-suppression materials and equipment.

B. Select fastener sizes that will not penetrate members if opposite side will be exposed to view or will receive finish materials. Tighten connections between members. Install fasteners without splitting wood members.

C. Attach to substrates as required to support applied loads.

3.07 GROUTING

A. Mix and install grout for fire-suppression equipment base bearing surfaces, pump and other equipment base plates, and anchors.

B. Clean surfaces that will come into contact with grout.

C. Provide forms as required for placement of grout.

D. Avoid air entrapment during placement of grout.

E. Place grout, completely filling equipment bases.

F. Place grout on concrete bases and provide smooth bearing surface for equipment.

G. Place grout around anchors.

H. Cure placed grout.

END OF SECTION

PART 1 GENERAL

1.01 **SECTION INCLUDES**

A. Pipe hangers and supports

B. Anchors and attachments

C. Fasteners

D. Shop plating and painting

1.02 PRODUCTS FURNISHED BUT NOT INSTALLED UNDER THIS SECTION

A. Companion high density filler pieces for installation over the top 180 degree surface of pipe or tubing, at points of support where a combination clevis hanger, insulation shield and high density insulating saddle are installed.

1.03 SUBMITTALS

A. Shop Drawings:
   1. Details of trapeze hangers and upper hanger attachments for piping 4 inches in diameter and over. Include the number and size of pipe lines to be supported on each type of trapeze hanger.

B. Product Data: Catalog sheets, specifications and installation instructions for each item specified except fasteners.

1.04 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Comply with the applicable requirements of the ASME B31 Piping Codes.
   2. Unless otherwise shown or specified, comply with the requirements of the Manufacturer's Standardization Society of the Valve and Fittings Industry (MSS) Standards SP-58, and SP-69.
   3. Materials for use in Sprinkler Systems and Standpipe and Hose Systems shall comply with the requirements of NFPA 13 and NFPA 14 as applicable.

PART 2 PRODUCTS

2.01 PIPE HANGERS AND SUPPORTS

A. Combination clevis hanger, pipe insulation shield and vapor barrier jacketed high density insulating saddle with companion high density filler piece.
   1. Insulating saddles and filler pieces shall be of the same thickness and materials as the adjoining pipe insulation. Saddles shall cover the lower 180 degrees of the pipe or tubing, and companion filler pieces shall cover the upper 180 degrees of the pipe or tubing. Physical sizes, gages, etc. of the components of insulated hangers shall be in accordance with the following schedule:

PIPE OR TUBING SIZE (Inches)	SHIELD LENGTH (Inches)	SHIELD GAGE	SADDLE LENGTH (Inches)	VAPOR BARRIER JACKET LENGTH (Inches)
Up to 2-1/2	4	16	6	10
3 to 6	4	14	6	10

8 to 14	10	12	12	16
16 and up	10	10	12	16

B. Pipe Insulation Shields: Fabricated of steel, with a minimum arc of 180 degrees, unless otherwise indicated. Shields for use with hangers and supports, with the exception of combination clevis type hangers, shall be in accordance with the following schedule:

PIPE OR TUBING SIZE (Inches)	SHIELD LENGTH (Inches)	SHIELD GAGE
Up to 2-1/2	8	18
3 to 8	10	16
10 to 14	12	12
16 and up	18	10

C. Pipe Hangers: Height adjustable standard duty clevis type, with cross bolt and nut.
   1. Pipe spreaders or spacers shall be used on cross bolts of clevis hangers, when supporting piping 10 inches in size and larger.
   2. Swivel ring type hangers will be allowed for sprinkler piping up to a maximum of 2 inches in size.

D. Adjustable Floor Rests and Base Flanges: Steel.

E. Hanger Rods: Mild, low carbon steel, fully threaded or threaded at each end, with two nuts at each end for positioning rod and hanger, and locking each in place.

F. Riser Clamps: Malleable iron or steel.

2.02 ANCHORS AND ATTACHMENTS

A. Sleeve Anchors (Group II, Type 3, Class 3): Molly's Div./USM Corp. Parasleeve Series, Ramset's Dynabolt Series, or Red Head/Phillips AN, HN, or FS Series.

B. Wedge Anchors (Zinc Plated, Group II, Type 4, Class 1): Hilti's Kwik Bolt Series, Molly's Div./USM Corp. Parabolt PB Series, Ramset's Trubolt T Series, or Red Head/Phillips WS Series.

C. Self-Drilling Anchors (Group III, Type 1): Ramset's RD Series, or Red Head/Phillips S Series.

D. Non-Drilling Anchors (Group VIII, Type 1): Ramset's Dynaset DS Series, Hilti's HDI Series, or Red Head/Phillips J Series.

E. Stud Anchors (Group VIII, Type 2): Red Head/Phillips JS Series.

F. Beam Clamps: Forged steel beam clamp, with weldless eye nut (right hand thread), steel tie rod, nuts, and washers, Grinnell's Fig No. 292 (size for load, beam flange width, and rod size required).

G. Metal Deck Ceiling Bolts: B-Line Systems' Fig. B3019.

2.03 FASTENERS

A. Bolts, Nuts, Washers, Lags, and Screws: Medium carbon steel; size and type to suit application; galvanized for high humidity locations, and treated wood; plain finish for other interior locations. Except where shown otherwise on the Drawings, furnish type, size, and grade required for proper installation of the Work.

2.04 SHOP PAINTING AND PLATING

A. Hangers, supports, rods, inserts and accessories used for pipe supports, unless chromium plated, cadmium plated or galvanized shall be shop coated with metal primer paint.

PART 3 EXECUTION

3.01 INSTALLATION

A. Do not hang or support one pipe from another or from ductwork.
   1. Do not bend threaded rod.

B. Support all insulated horizontal piping conveying fluids below ambient temperature, by means of hangers or supports with insulation shields installed outside of the insulation.

C. Space hangers or supports for horizontal piping on maximum center distances as listed in the following hanger schedules, except as otherwise specified, or noted on the Drawings.
   1. For Steel Pipe:

PIPE SIZE (Inches)	MAXIMUM SPACING (Feet)
1 and under	8
1-1/4 and 1-1/2	9
2	10
2-1/2 and up	12

   1. For Grooved End Steel Pipe:

PIPE SIZE (Inches)	MAXIMUM SPACING (Feet)
1-1/2 and under	7
2 through 4	10
5 and over	12

   1. No pipe length shall be left unsupported between any two coupling joints.
   2. For Directional Changes: Install a hanger or support close to the point of change of direction of all pipe runs in either a horizontal or vertical plane.
   3. For Concentrated Loads: Install additional hangers or supports, spaced as required and directed, at locations where concentrated loads such as in-line pumps, valves, fittings or accessories occur, to support the concentrated loads.
   4. For Branch Piping Runs and Runouts Over 5 feet In Length: Install a minimum of one hanger, and additional hangers if required by the hanger spacing schedules.
   5. Parallel Piping Runs: Where several pipe lines run parallel in the same plane and in close proximity to each other, trapeze hangers may be submitted for approval. Base hanger spacing for trapeze type hangers on the smallest size of pipe being supported. Design the

entire hanger assembly based on a safety factor of five, for the ultimate strength of the material being used.

D. Minimum Hanger Rod Size: Increase hanger rod size as required to meet requirements of seismic restraint system.

PIPE OR TUBING SIZE (Inches)	SINGLE ROD HANGER SIZE (Inches)		DOUBLE ROD HANGER SIZE (Inches)	
	PIPE	TUBING	PIPE	TUBING
1/2 to 2	3/8	1/4	3/8	1/4
2-1/2 and 3	1/2	3/8	3/8	1/4
4 and 5	5/8	1/2	1/2	3/8
6	3/4	1/2	5/8	1/2
8, 10 and 12	7/8	5/8	3/4	5/8

1. Size hanger rods, for piping over 12 inches in size and multiple line supports, based on a safety factor of five for the ultimate strength of the materials being used.
2. Secure hanger rods as follows: Install one nut under clevis, angle or steel member; one nut on top of clevis, angle or steel member; one nut inside insert or on top of upper hanger attachment and one nut and washer against insert or on lower side of upper hanger attachment. A total of four nuts are required for each rod, two at upper hanger attachment and two at hanger.

E. Vertical Piping:
1. Support vertical risers of piping systems, by means of heavy duty hangers installed close to base of pipe risers, and by riser clamps with extension arms at intermediate floors, with the distance between clamps not to exceed 25 feet, unless otherwise specified. Support pipe risers in vertical shafts equivalent to the aforementioned. Install riser clamps above floor slabs, with the extension arms resting on floor slabs. Provide adequate clearances for risers that are subject to appreciable expansion and contraction, caused by operating temperature ranges.
2. Support extension arms of riser clamps, secured to risers to be insulated for cold service, 4 inches above floor slabs, to allow room for insulating and vapor sealing around riser clamps.

F. Floor Supports: Install adjustable yoke rests with base flanges, for the support of piping, unless otherwise indicated on the Drawings. Install supports in a manner, which will not be detrimental to the building structure.

3.02 UPPER HANGER ATTACHMENTS

A. General:
1. Secure upper hanger attachments to overhead structural steel, steel bar joists, or other suitable structural members.
2. Do not attach hangers to steel decks that are not to receive concrete fill.
3. Do not attach hangers to precast concrete plank decks less than 2-3/4 inches thick.
4. Do not use flat bars or bent rods as upper hanger attachments.

B. Attachment to Steel Frame Construction: Provide intermediate structural steel members where required by pipe support spacing. Select steel members for use as intermediate supports based on a minimum safety factor of five.
   1. Do not use drive-on beam clamps.
   2. Do not support piping over 4 inches in size from steel bar joists. Secure upper hanger attachments to steel bar joists at panel points of joists.
   3. Do not drill holes in main structural steel members.
   4. Beam clamps, with tie rods as specified, may be used as upper hanger attachments for the support of piping, subject to clamp manufacturer's recommended limits.

C. Attachment to Concrete Filled Steel Decks:
   1. New Construction: Install metal deck ceiling bolts.
   2. Existing Construction: Install welding studs (except at roof decks). Do not support a load in excess of 250 lbs from any single welded stud.
   3. Do not attach hangers to decks less than 2-1/2 inches thick.

D. Attachment to Cast-In-Place Concrete: Secure to overhead construction by means of cast-in-place concrete inserts.

E. Attachment to Existing Cast-In-Place Concrete:
   1. For piping up to a maximum of 4 inches in size, secure hangers to overhead construction with self-drilling type expansion shields and machine bolts.
   2. Secure hangers to wall or floor construction with single unit expansion shields or self-drilling type expansion shields and machine bolts.

F. Attachment to Cored Precast Concrete Decks (Flexicore, Dox Plank, Spancrete, etc.): Toggle bolts may be installed in cells for the support of piping up to a maximum of 2-1/2 inches in size.

G. Attachment to Hollow Block or Hollow Tile Filled Concrete Decks:
   1. New Construction: Omit block or tile and pour solid concrete with cast-in-place inserts.
   2. Existing Construction: Break out block or tile to access, and install machine bolt anchors at highest practical point on side of web.

H. Attachment to Waffle Type Concrete Decks:
   1. New Construction: Install cast-in-place inserts.
   2. Existing Construction: Install machine bolt expansion anchors at highest practical point on side of web.

I. Attachment to Precast Concrete Tee Construction:
   1. New Construction: Tee hanger inserts between adjacent flanges, except at roof deck without concrete fill.
   2. Existing Construction: Dual unit expansion shields in webs of tees. Install shields as high as possible in the webs.
      a. Exercise extreme care in the field drilling of holes to avoid damage to reinforcing.
      b. Do not use powder driven fasteners.

J. Attachment to Wood Construction: Secure hangers to the sides (only) of wood members, by means of malleable iron side beam connectors, or malleable iron or steel side beam brackets. Do not secure hanger attachments to nailing strips resting on top of steel beams.
   1. Secure side beam connectors to wood members with two No. 18 x 1-1/2 inch long wood screws, or two No. 16 x 1-1/2 inch long drive screws. Do not support piping over 1-1/2 inches in size from side beam connectors. Do not hammer in wood screws.
   2. Secure side beam brackets to wood members with steel bolts or lag screws. Do not use lag screws in wooden members having a nominal thickness (beam face) less than 2

inches in size. Install bolts or lag screws, in the sides of a timber or a joist, at the mid-point or above, not less than 2-1/2 inches from the lower edge when supporting branch lines and not less than 3 inches from the lower edge when supporting mains. Install heavy gage steel washers under all nuts.

3. Secure side beam brackets to wooden beams or joists, with lag screws or bolts of size as follows:

PIPE SIZE (Inches)	LAG SCREW SIZE (Inches)	BOLT DIAMETER (Inches)
2 and under	3/8 diameter x 1-3/4	3/8
2-1/2 and 3	1/2 diameter x 2	1/2
4 and 5	Use Bolt	5/8

1. Do not support piping larger than 3 inches with lag screws. Pre-drill holes for lag screws 1/8 inch in diameter less than the root diameter of the lag screw thread.
2. The minimum width of the lower face of wood beams or joints in which lag screws of size as specified may be used is as follows:

LAG SCREW DIAMETER (Inches)	NOMINAL WIDTH OF BEAM FACE (Inches)
3/8	2
1/2	3

1. Do not secure hanger attachment to the diagonals or vertical members of the trusses.

3.03 COMBINATION CLEVIS HANGER, PIPE INSULATION SHIELD AND VAPOR BARRIER JACKETED HIGH DENSITY INSULATING SADDLES

A. Install a combination clevis hanger, pipe insulation shield and vapor barrier jacketed high density insulating saddles, at all points of support for piping or tubing to be insulated for cold service. Furnish companion high density vapor barrier jacketed saddle pieces, of the same material, thickness and length, for installation over the top 180 degree surface of pipe or tubing, at each point of support where an insulated clevis hanger is utilized.

3.04 PIPE INSULATION SHIELDS

A. Unless otherwise specified, install a pipe insulation shield, at all points of support. Center shields on all hangers and supports outside of high density insulation insert, and install in such a manner so as not to cut, or puncture jacket.

END OF SECTION

PART 1 GENERAL

1.01 **SECTION INCLUDES**

A. Steel pipe and fittings

B. Ductile iron pipe and fittings

C. Couplings and fittings for grooved end pipe

D. Joining and sealant materials

E. Packing materials for building construction penetrations

F. Pipe sleeves

G. Floor, wall, and ceiling plates

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Joint Sealants: Section 079200.

1.03 REFERENCES

A. NFPA 13 - Standard for the Installation of Sprinkler Systems.

1.04 SUBMITTALS

A. Product Data:
   1. Catalog sheets and specifications indicating manufacturer name, type, applicable reference standard, schedule, or class for specified pipe and fittings.
   2. Material Schedule: Itemize pipe and fitting materials for each specified application in Pipe and Fittings Schedule in Part 3 of this Section. Where optional materials are specified indicate option selected.

PART 2 PRODUCTS

2.01 STEEL PIPE AND FITTINGS

A. Steel Pipe for Threading: Standard weight, Schedule 40, black or galvanized; ASTM A 53 or ASTM A 135.

B. Steel Pipe for Roll Grooving: Standard weight, Schedule 40, black or galvanized; ASTM A 53, Grade B, Type F for sizes 3/4 inch to 1-1/2 inch, and Type E or S for sizes 2 inch to 24 inch, or ASTM A 135.

C. Cast Iron Fittings:
   1. Drainage Pattern, Threaded: ASME B16.12.
   2. Steam Pattern, Threaded: ASME B16.4.
      a. Standard Weight: Class 125.
      b. Extra Heavy Weight: Class 250.
   3. Flanged Fittings and Threaded Flanges: ASME B16.1.
      a. Standard Weight: Class 125.
      b. Extra Heavy: Class 250.

D. Unions: Malleable iron, 250 lb class, brass to iron or brass to brass seats.

E. Couplings: Same material and pressure rating as adjoining pipe, conforming to standards for fittings in such pipe. Use taper tapped threaded type in screwed pipe systems operating in excess of 15 psig.

F. Nipples: Same material and strength as adjoining pipe, except nipples having a length of less than one inch between threads shall be extra heavy.

2.02 DUCTILE IRON PIPE AND FITTINGS

A. Water Pipe: Bitumin coated and cement-mortar lined; AWWA C151.
   1. 3 and 4 Inch Sizes: Class 51.
   2. 6 inch Size and Over: Class 50.

B. Fittings: Bitumin coated and cement-mortar lined; AWWA C110.

2.03 COUPLINGS AND FITTINGS FOR GROOVED END PIPE

A. Couplings: Grinnell Corp.'s Rigidlok Fig. 7401, or Victaulic Co.'s Style 107, having minimum pressure rating of:
   1. 750 psi from 1-1/2 inch to 4 inch.
   2. 700 psi for 6 inch.
   3. 600 psi for 8 inch.

B. Fittings: By same manufacturer as couplings, having pressure ratings equal to or greater than couplings. Comply with the following standards:
   1. Steel: ASTM A 53 or A 106, Grade B.
   2. Malleable Iron: ASTM A 47.
   3. Ductile Iron: ASTM A 536.

2.04 JOINING AND SEALANT MATERIALS

A. Thread Sealant:
   1. LA-CO Industries' Slic-Tite Paste with Teflon.
   2. Loctite Corp.'s No. 565 Thread Sealant.
   3. Thread sealants for potable water shall be NSF approved.

B. Joint Packing:
   1. Oiled Oakum: Manufactured by Nupak of New Orleans, Inc., 931 Daniel St., Kenner, LA 70062, (504) 466-1484.

C. Gaskets For Use With Ductile Iron Water Pipe: Synthetic rubber rings (molded or tubular): Clow Corp.'s Belltite, Tyler Pipe Industries Inc.'s Ty-Seal, or U.S. Pipe and Foundry Co.'s Tyton.

D. Flange Gasket Material:
   1. For Use With Cold Water: 1/16 inch thick rubber.

E. Gaskets For Use With Grooved End Pipe and Fittings: Type and materials as recommended and furnished by the fitting manufacturer, for the service of piping system in which installed.

F. Anti-Seize Lubricant: Bostik Inc.'s Never Seez or Dow Corning Corp.'s Molykote 1000.

2.05 PACKING MATERIALS FOR BUILDING CONSTRUCTION PENETRATIONS

A. Oiled Oakum: Manufactured by Nupak of New Orleans, Inc., 931 Daniel St., Kenner, LA 70062, (504)466-1484.

B. Mechanical Modular Seals for exterior penetrations: Thunderline Corp.'s Link Seal wall and floor seals designed for the service of piping system in which installed.

2.06 PIPE SLEEVES

A. Type A: Schedule 40 steel pipe.

B. Type B: No. 16 gage galvanized sheet steel.

C. Type C: Schedule 40 steel pipe with 1/4 inch steel collar continuously welded to pipe sleeve. Size steel collars as required to span a minimum of one cell or corrugation, on all sides of the rough opening thru the metal deck.

D. Type D: No. 16 gage galvanized sheet steel with 16 gage sheet steel metal collar rigidly secured to sleeve. Size metal collars as required to span a minimum of one cell or corrugation, on all sides of the rough opening thru the metal deck.

2.07 FLOOR, WALL AND CEILING PLATES

A. Cast Brass (2-inch and under in finished spaces): Solid type with polished chrome plated finish, and set screw.
   1. Series Z89 by Zurn, 929 Riverside Drive, Grosvenordale, CT 06255, (800) 243-1830.
   2. Model 127XXXX by Maguire Mfg., Cheshire CT 06410, (203) 699-1801.

B. Stamped Steel (6-inch and under in finished spaces): Split type, polished chrome plated finish, with set screw.
   1. Figures 2 and 13 by Anvil International, Portsmouth, NH 03802, (603) 422-8000.

C. Cast Iron or Malleable Iron (8-inch and under in unfinished spaces) : Solid type, galvanized finish, with set screw:

D. Model 395 by Anvil International, Portsmouth, NH 03802, (603) 422-8000.
   1. Model 900-016XX by Landsdale International, Westville, NJ 08093, (800) 908-0523.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install piping at approximate locations indicated, and at maximum height.

B. Install piping clear of door swings, and above sash heads.

C. Make allowances for expansion and contraction.

D. Allow for a minimum of one inch free air space around pipe or pipe covering, unless otherwise specified.

E. Install horizontal piping with a constant pitch, and without sags or humps.

F. Install vertical piping plumb.

G. Use fittings for offsets and direction changes.

H. Cut pipe and tubing ends square; ream before joining.

I. Threading: Use American Standard Taper Pipe Thread Dies.

3.02 FIRE SPRINKLER AND FIRE STANDPIPE PIPING SYSTEM

A. Install piping to be completely drainable.

3.03 PIPE JOINT MAKE-UP

A. Threaded Joint: Make up joint with a pipe thread compound applied in accordance with manufacturer's printed application instructions for the intended service.

B. Flanged Pipe Joint:
   1. Install threaded companion flanges on steel pipe; flanges on galvanized pipe are not required to be galvanized.
   2. Provide a gasket for each joint.
   3. Coat bolt threads and nuts with anti-seize lubricant before making up joint.

C. Rubber Ring Push-on Joint: Clean hub, bevel spigot, and make up joint with lubricated gasket in conformance with the manufacturer's printed installation instructions.

D. Grooved Pipe Joint: Roll groove pipe ends, make up joint with grooved end fittings and couplings, in conformance with the manufacturer's printed installation instructions.
   1. Cut grooved end piping is not acceptable.

E. Mechanical Joint: Make up joint in conformance with the manufacturer's printed installation instructions, with particular reference to tightening of bolts.

F. Dissimilar Pipe Joint:
   1. Joining Bell and Spigot and Threaded Pipe: Install a half coupling on the pipe or tube end to form a spigot, and calk into the cast iron bell.
   2. Joining Dissimilar Threaded Piping: Make up connection with a threaded coupling or with companion flanges.
   3. Joining Dissimilar Non-Threaded Piping: Make up connection with adapters recommended by the manufacturers of the piping to be joined.
   4. Joining Galvanized Steel Pipe and Copper Tubing: Make up connection with a dielectric connector.

3.04 PIPING PENETRATIONS

A. Sleeve Schedule: Unless otherwise shown, comply with the following schedule for the type of sleeve to be used where piping penetrates wall or floor construction:

	CONSTRUCTION	SLEEVE TYPE
1.	Frame construction.	None Required
2.	Foundation walls.	A*
3.	Non-waterproof interior walls.	B*
4.	Non-waterproof interior floors on metal decks.	D*
5.	Non-waterproof interior floors not on metal decks	B*
6.	Floors not on grade having a floor drain.	A
7.	Floors over mechanical equipment, steam service, machine, and boiler rooms.	A

8.	Floors finished or to be finished with latex composition or terrazzo, and on metal decks.	D*
9.	Floors finished or to be finished with latex composition or terrazzo, and not on metal decks.	A
10.	Earth supported concrete floors.	None Required
11.	Exterior concrete slabs on grade.	A
12.	Fixtures with floor outlet waste piping.	None Required
13.	Metal roof decks.	C
14.	Non-metal roof decks.	A
15.	Waterproof floors on metal decks.	D
16.	Waterproof floors not on metal decks.	A
17.	Waterproof walls.	A

*Core drilling is permissible in lieu of sleeves where marked with asterisks.

B. Diameter of Sleeves and Core Drilled Holes:
   1. Unless otherwise specified, size holes thru floors and walls in accordance with the through penetration fire stopping system being used.
   2. Size holes thru exterior walls or waterproofed walls above inside earth or finished floors, and exterior concrete slabs in accordance with the following:
      a. Uninsulated (Bare) Pipe: Inside diameter of sleeve or core drilled hole 1/2 inch greater than outside diameter of pipe, unless otherwise specified.
      b. Insulated Pipe: Inside diameter of sleeve or core drilled hole 1/2 inch greater than outside diameter of insulation, unless otherwise specified.
      c. Mechanical Modular Seals: Size holes in accordance with the manufacturer's recommendations.
   3. Size holes for sprinkler and fire standpipe piping in accordance with NFPA 13.

C. Length of Sleeves (except as shown otherwise on Drawings):
   1. Walls and Partitions: Equal in length to total finished thickness of wall or partition.
   2. Floors, Finished: Equal in length to total finished thickness of floor and extending 1/2 inch above the finished floor level, except as follows:
      a. In furred spaces at exterior walls, extend sleeve one inch above the finished floor level.
   3. Exterior Concrete Slabs: Equal in length to total thickness of slab and extending 1/2 inch above the concrete slab.
   4. Roofs: Equal in length to the total thickness of roof construction, including insulation and roofing materials, and extending one inch above the finished roof level.

D. Packing of Sleeves and Core Drilled Holes:
   1. Unless otherwise specified, pack sleeves or cored drilled holes in accordance with Section 078400 - FIRESTOPPING.
   2. Pack sleeves in exterior walls or waterproofed walls above inside earth or finished floors with oakum to within 1/2 inch of each wall face, and finish both sides with Type 1C (one part) sealant. See Section 079200.
      a. Mechanical modular seals may be used in lieu of packing and sealant for sleeves and core drilled holes.
   3. Pack sleeves in exterior concrete slabs with oakum to full depth, and within 1/2 inch of top of sleeve and finish the remainder with sealant. See Section 079200.
      a. Sealant Types:
      b. Piping Conveying Materials up to 140 degrees F other than Motor Fuel Dispensing System Piping: Type 1C (one part).

c. Mechanical modular seals may be used in lieu of packing and sealant for sleeves and core drilled holes.

E. Weld metal collars of Type C and D sleeves to the upper surface of the metal deck. Seal voids under the metal collar as recommended by the manufacturer of the metal deck.

3.05 FLOOR, WALL AND CEILING PLATES

A. Install plates for exposed uninsulated piping passing thru floors, walls, ceilings, and exterior concrete slabs as follows:
   1. Piping 2 Inch Size and Smaller In Finished Spaces:
   2. Solid Type: Chrome plated cast brass construction with set screw.
   3. Split Type: Chrome plated stamped steel construction with set screw.
   4. Piping over 2 inch size In Finished Spaces, and Piping in Unfinished Spaces:
      a. Solid Type: Galvanized cast iron construction with set screw.
   5. Split Type: Chrome plated stamped steel construction with set screw.
   6. Piping in Unfinished Spaces (Including Exterior Concrete Slabs): Solid type, galvanized, cast iron or malleable iron construction.
   7. Fasten plates with set screws.
   8. Plates are not required in pipe shafts or furred spaces.

3.06 PIPE AND FITTING SCHEDULE

A. Where options are given, choose only one option for each piping service. No deviations from the selected option will be allowed.

B. Fire Standpipe and Sprinkler:
   1. Option No. 1: Standard weight black steel pipe, with standard weight cast iron fittings, and threaded joints.
   2. Option No. 2: Standard weight black steel pipe, with roll grooved ends, grooved pipe fittings, and couplings.

C. Sprinkler and Standpipe (Below Ground): Coated ductile iron water pipe and fittings, with mechanical or push-on joints.

END OF SECTION

PART 1 GENERAL

1.01 **SECTION INCLUDES**

A. Valves and accessories
   1. Gate valves
   2. Inspector's test outlet valve
   3. Valve locking devices
   4. Alarm check valve
   5. Check valves
   6. Inspector's test connection

B. Sprinkler heads and appurtenances

C. Fire department connection

D. Water flow alarm device

E. Electrical alarm gong

F. Signs

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Painting: Section 099100.

B. Backflow Preventers: Section 221118.

C. Pipe Hangers and Supports for Fire Suppression Piping and Equipment: Section 210529.

D. Sprinkler and Standpipe Piping: Section 211300.

1.03 REFERENCES

A. NFPA 13 - National Fire Protection Association Standard for the Installation of Sprinkler Systems.

1.04 SYSTEM DESCRIPTION

A. Type of System:
   1. Wet System

1.05 SUBMITTALS

A. Shop Drawings:
   1. Complete sprinkler system layout indicating the locations of sprinkler heads, devices, and accessories. Include separate details of special or not easily visualized piping arrangements and inspector’s test valves and connections.
   2. Hydraulic calculations shall be complete and cross referenced to the appropriate drawing sheets.

B. Product Data: Catalog sheets, specifications, and installation instructions. Indicate UL or FM approval for each product. Include the following additional information:
   1. Electrical Devices: Complete description of intended use, wiring diagrams, data plate information and, in the case of switching devices, whether normally on, or normally off. Include motor test data.

2. Mechanical Devices: Complete description of intended use, including normal operating capacities and working pressures.
3. Enclosures: Dimensions, materials, gages of metals; type of door hinges and locks, and methods of securing the enclosure members to the building construction.
4. Hose Threads: Verify that hose threads on fire department connections match threads on equipment used by the local or servicing fire department.

C. Quality Control Submittals:
1. Design Data: The portions of the sprinkler system not sized on the Contract Drawings shall be sized in accordance with NFPA requirements for Hydraulically Designed Systems. Submit drawings and hydraulic calculations for approval.
2. Certificates: As required under Quality Assurance Article.
3. Installers Qualification Data:
a. Name of each person who will be performing the Work.
b. Upon request, furnish names and addresses of the required number of similar projects that each person has worked on which meet the experience criteria.

D. Contract Closeout Submittals:
1. Operation and Maintenance Data. Deliver 2 copies to the Owner's Representative:
a. Instruction manual describing the operation and maintenance of the system.
b. Parts list for each mechanical and electrical device.
c. Publication NFPA 25, Inspection, Testing, and Maintenance of Water Based Fire Protection Systems.

1.06 QUALITY ASSURANCE

A. Qualifications: The persons employed to perform the Work of this Section and their supervisor shall be personally experienced in sprinkler work and shall have been regularly performing such work for a minimum of 5 years while in the employ of a company or companies engaged in the installation of sprinkler systems.
1. Upon request, furnish to the Owner the names and addresses of five similar projects which the foregoing people have worked on during the past 3 years.

B. Regulatory Requirements:
1. Materials for the Work of this Section shall be Underwriter's Laboratories listed, and/or Factory Mutual approved.

C. Certification: NFPA Contractor's Material and Test Certificate.

1.07 MAINTENANCE

A. Spare Parts: Furnish the following items and deliver to the Owner for storage in spare sprinkler head cabinets:
1. Spare sprinkler heads of each temperature range:
2. One sprinkler head wrench to fit each type sprinkler head.

PART 2 PRODUCTS

2.01 VALVES AND ACCESSORIES

A. Gate Valves (175 psig non-shock working pressure):
1. 3/4 inch to 2 inch: Bronze body, OS & Y indicating type; double or wedge disc with threaded ends.
2. 2-1/2 inch and larger: IBBM, OS & Y indicating type; double or wedge disc with end connections as required to suit the piping system.

B. Inspector's Test Outlet Valve: Ball type, bronze body, Type 316 stainless steel ball and stem, teflon seats and stem packing, 400 psi WOG. Valve shall have padlocking feature in both the open and closed position.

C. Valve Locking Devices:
   1. Chain: 3/16 inch galvanized steel, welded link.
   2. Padlock: Series 800 by Yale, Eaton Corp., Charlotte, NC: Key all locks alike. Furnish 2 keys for each lock.
   3. Key Tags: 1-1/2 inch dia., brass, stamped with valve number and service.
   4. "S" Hooks: Brass, for securing keys to key tags.

D. Alarm Check Valve:
   1. Two piece cast iron body, bolted and gasketed.
   2. Moving parts brass, bronze, or stainless steel with replaceable rubber clapper facing.
   3. Right or left hand trimming as required.
   4. Suitable for horizontal or vertical installation.
   5. Two pressure gages.
   6. Main drain tap.
   7. Factory finish with corrosion resistant red paint.
   8. Trim Package: Angle valve, globe valve, alarm line strainer, orifice restriction, pipe nipples and fittings.

E. Check Valves: IBBM, single clapper swing check with metal to metal or rubber faced checks, suitable for horizontal and vertical installation; end connections as required to suit the piping system; 175 psig non-shock working pressure.
   1. Ball Drip (where shown on Drawings): Brass, automatic; threaded on both ends.

F. Inspector's Test Connection: Cast brass, capped, sprinkler line tester fitting; Elkhart Brass Mfg. Co.'s. No. 112, or Seco Mfg., Inc.'s No. 445 or 446.

2.02 SPRINKLER HEADS AND APPURTENANCES

A. Sprinkler Heads: Brass or bronze, with standard 1/2 inch orifice, and deflector:
   1. Upright or Pendent Type: Deflector designed to distribute water downward in a uniform hemispherical spray pattern.
   2. Flush Pendent Type: All or part of sprinkler body including shank thread mounts above lower plane of finished ceiling.
   3. Sidewall Type: Horizontal or vertical sprinklers with special deflectors designed to discharge most of the water away from nearby wall in a pattern resembling 1/4 of a sphere with a small portion of discharge directed at wall behind sprinkler.
   4. Markings: Stamp sprinkler type on deflector in addition to NFPA's color code requirements covering temperature classification.

B. Spare Sprinkler Head Cabinet: Steel, with hinged cover, constructed of minimum 20 gage material and fitted with 16 gage steel racks designed to hold quantities and types of spare sprinkler heads and sprinkler head wrenches.
   1. Finish: Bright red, baked on enamel.

2.03 FIRE DEPARTMENT CONNECTION

A. Siamese Connection: Two way flush wall type, brass with polished finish; size 2-1/2 x 2-1/2 x 4 inch , with two 2-1/2 inch female connections, 2 individual drop clapper valves, plugs and chains, and escutcheon.
   1. Equip above with integral sillcock having hose bibb end, cap, chain and removable tee handle key. Furnish 2 keys. Deliver to the Owner.

B. Identification: Provide signage stating “AUTOSPKR”, or “AUTOSPKR AND STANDPIPE” or as required by AHJ.

2.04 WATER FLOW ALARM DEVICE

A. Vane Type Waterflow Switch: System Sensor WFDN, Autocall Div., Federal Signal Corp.’s 4160, Potter Electric Signal Co.’s VSR-F, or Reliable’s Model A., having:
   1. Corrosion-resistant vane.
   2. Splash/dust resistant enclosure with anti-tamper switch.
   3. Adjustable pneumatic retard.
   4. Screw type wiring terminals.

2.05 ELECTRIC ALARM GONG

A. 8 inch diameter vibrating bell; 24 V dc. Sound rating 80 db; System Sensor SSM24-8 or equal.
   1. Markings: The words FIRE ALARM in block lettering on a contrasting background.
   2. Mounting: Suitable for both wall and ceiling mounting.

2.06 SIGNS

A. Steel with vitreous enamel finish, lettering on contrasting background to identify and indicate the function of:
   1. Control valves.
   2. Drain, test, air supply and alarm check valves.
   3. Water motor alarm.
   4. Anti-freeze loop.
   5. Anti-freeze loop drain and test valves.
   6. Hydraulic Design Nameplate Data: Size approx. 9 x 12 inches, inscribed with the following::
      a. SPRINKLER SYSTEM HYDRAULICALLY DESIGNED (in block letters).
      b. Location and area of hydraulically designed section.
      c. Discharge density over designed area in gallons per minute.
      d. Residual pressure at base of riser supplying water to designed section.

PART 3 EXECUTION

3.01 INSTALLATION

A. Unless otherwise shown or specified, install the Work of this section in accordance with NFPA 13, and the item manufacturer’s installation instructions.

B. Locking Valves:
   1. Lock gate valves in open position with chain looped through handwheel and around adjacent sprinkler pipe. Secure with padlock.
   2. Lock test outlet valve in closed position with padlock.

C. Spare Sprinkler Head Cabinet: Secure to building wall or other permanent structure in vicinity of main valve controlling sprinkler system, unless otherwise directed.

D. Signs: Install signs identifying the following:
   1. Valves: One for each size, type and function.
   2. Fire Department Connection
   3. Alarm Valves
   4. Hydraulically Designed System.

3.02 FIELD QUALITY CONTROL

A. Tests: Unless otherwise shown or specified, perform tests in accordance with NFPA 13.
   1. Flushing: In addition to the requirements of the Standard, flush new piping before making final connection to existing systems and before performing hydrostatic test. Flush at rates of flow prescribed in the Contractor's Material and Test Certificate. After making final connections, flush entire system and assure that debris is removed from piping and there are no stoppages or obstructions in the system.
   2. System Tests:
      a. Test all new Work.
      b. Notify the Owner's Representative when the Work of this Section is ready for testing.
      c. Perform the tests when directed, and in the Owner's Representatives presence.

END OF SECTION

PART 1: GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:
1. Coordination
2. Interpretation of Plans
3. Coordination Drawings.
4. Cost Breakdown
5. Substitutions and Prior Approval Requests
6. Record Documents
7. Maintenance Manuals
8. Fire Safety Precautions
9. Personal Safety Requirements
10. Testing, Adjusting and Balancing
11. Equipment Rebates
12. Temporary Equipment Operation
13. Piping materials and installation instructions common to most piping systems.
14. Equipment installation requirements common to equipment sections.
15. Painting and finishing.
16. Concrete bases.
17. Supports and anchorages.

1.03 GENERAL

A. This Section includes mechanical items common to all of this division specification sections.

B. Provide services, skilled and common labor, and all apparatus and materials required for the complete installation as shown and within the intent of the contract documents, field conditions, and code requirements.

C. The intention of these Contract Documents is to call for finished work, fully tested and ready for operation. Any components or labor not mentioned in the Contract Documents but required for functioning systems shall be provided. Should there appear to be any discrepancies or questions of intent, the Contractor shall refer the matter to the Architect/Engineer for decision before start of any related work.

D. The drawings show the general arrangement of systems and equipment but do not show all required fittings and offsets that may be necessary to connect pipes and ductwork to equipment, and to coordinate with other trades. Provide all necessary fittings, offsets and runs based on field measurements and at no additional cost. Coordinate with other trades for space available and relative location of equipment and accessories. Pipe and duct location on the drawings shall be altered by contractor where necessary to avoid interferences and clearance difficulties.

1.04 DEFINITIONS

A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe chases, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.

B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.

C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in chases.

E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

F. The following are industry abbreviations for plastic materials:
   1. ABS: Acrylonitrile-butadiene-styrene plastic.
   2. CPVC: Chlorinated polyvinyl chloride plastic.
   3. PE: Polyethylene plastic.
   4. PVC: Polyvinyl chloride plastic.

G. The following are industry abbreviations for rubber materials:
   1. EPDM: Ethylene-propylene-diene terpolymer rubber.
   2. NBR: Acrylonitrile-butadiene rubber.

1.05 WARRANTY

A. Provide guarantee and maintain the stability of workmanship and materials used and keep same in good operating condition for a period of minimum or one year after final completion of the work (unless specified otherwise) as evidenced by the issuance of the final certificate by the Architect.

B. Correct any deficiencies/defects of any kind immediately and; at the Contractors expense due to faulty workmanship or materials that arise during the above mentioned period of time. Corrections shall be done to the satisfaction of the Engineer/Architect. Such reconstruction and/or repairs shall include damages to the finishes or the building resulting from the original defect.

1.06 COORDINATION

A. Coordinate mechanical work with that of other trades in order to:
   1. Avoid interferences between general construction, mechanical, electrical, structural and other specialty trades.
   2. Maintain clearances and advise other trades of clearance requirements for operation, repair, removal and testing of mechanical equipment.
   3. Indicate aisle-ways and access-ways required on coordinated shop drawings for roof equipment area, mechanical equipment rooms, data and telecomm rooms, corridors, ceiling spaces, shafts, corridors, ceiling space, laboratories, etc.

B. Understanding of Work:
   1. Study, examine, and compare of the contract documents, including drawings and specifications. The Subcontractor shall have a full understanding of how the work in this part is scheduled, phased, and installed with work of other trades.
   2. Include in this installation piping, ductwork, devices, and equipment that are necessary for complete and operating systems as specified and as required.
   3. Connect piping and ductwork from fixtures, outlets, and devices full size to the nearest suitable main or riser.

4. Certain installations may be presented as typical, and full details are not repeated for each case. Subcontractor shall provide complete installation as if full details apply to each and every case, and make adjustments to typical details to suit each specific installation as part of the basic work.
5. Installation of work presented on the diagrams are applicable to the plans, and work depicted on the plans are applicable to the diagrams.
6. If there is a discrepancy in the drawings or specifications, the contractor shall figure the work based on the most stringent requirements to complete the installation and obtain clarification from the Architect before installation.

C. Sequence, coordinate, and integrate the various elements of mechanical systems, materials, and equipment. Comply with the following requirements:
1. Coordinate mechanical systems, equipment, and materials installation with other building components.
2. Verify dimensions by field measurements.
3. Arrange for chases, slots, and openings in other building components during progress of construction, to allow for mechanical installations.
4. Coordinate the installation of required supporting devices and sleeves to be set in poured-in- place concrete and other structural components, as they are constructed.
5. Sequence, coordinate, and integrate installations of mechanical materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing in the building.
6. Where mounting heights are not detailed or dimensioned, install systems, materials and equipment to provide the maximum headroom possible. Work shall be above ceilings or ceiling line.
7. Coordinate installation and connection of mechanical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required connection for each service.
8. Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are shown only in diagrammatic form. Coordinate with individual system requirements.
9. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.
10. Install mechanical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. As much as is practical, connect equipment for ease of disconnecting, with minimum of interference with other installations. Extend grease fittings to an accessible location.
11. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope.
12. Coordinate with the locations of electrical panels and avoid installing piping and ductwork over them. Electrical panels are purposely located and have priority for location. The contractor is responsible for required piping and ductwork offsets to insure that the panels are located as designed and for other conditions.
13. Perform system modification recommended by Test and Balance Agency after recommendations are accepted by the Engineer

1.07 INTERPRETATION OF PLANS

A. In general, the Drawings are to scale. However, to determine exact locations of walls and partitions, the Contractor shall consult the architectural and/or structural Drawings which are dimensioned. Drawings shall not take precedence over field measurements.

B. Drawings are diagrammatic only. They are intended to indicate size and/or capacity where stipulated, approximate location and/or direction, and approximate general arrangement of one

phase of work to another, but not the exact detail of construction. All work shall be constructed from field measurements taken at the site. This shall include all rises, drops, elbows, offsets, etc as necessary to avoid structural members or equipment and materials installed by other trades. The contractor shall coordinate the ductwork and piping layout before construction. No additional costs will be allowed for piping and ductwork fabrications without field verification of available space. If it is found, before installation, that a more convenient, suitable or workable arrangement of any or all phases of construction would result by altering the arrangement indicated on the Drawings, the architect/engineer may require the contractor to change the arrangement of his work without additional cost to the owner.

C. The drawings and specifications are intended to supplement each other. Any items shown on the drawings and not mentioned in the specifications, or vice versa, shall be executed the same as if mentioned and shown.

D. The greatest quantity or more expensive work shall govern where there is a conflict noted anywhere on the drawings and/or specifications.

1.08 COORDINATION DRAWINGS

A. Review contract documents and prepare coordination model drawings as an informational supplemental submittal in accordance with Division 1, 21, 22, and 23 requirements. Provide drawings of all areas of the project. Architectural models of the building will be made available upon request. Detailed mechanical models will not be made available. Facilitate coordination meetings and revise drawings as required to resolve work conflicts.

B. All contractors (including steel, precast concrete, fire protection, lighting, plumbing, piping, and building sound systems) are required to attend a minimum of (3) three coordination meetings on site to resolve any coordination issues prior to start of construction.

C. If the coordination drawings are not complete and/or coordinated prior to the work being started no extra cost shall be incurred by the owner due to coordination issue and it shall be the responsibility of the contractors to make the necessary modifications to the system to meet the requirements. All modifications shall be approved by the engineer/architect but at the cost to the contractor.

D. The composite model drawings of all trades shall detail all structural building elements, mechanical equipment, and work of other trades. Indicate locations where space is limited for installation, access for service, and where sequencing and coordination of installations are of importance to the efficient flow of work. The composite drawings shall include at a minimum the following. Where required for clarity multiple composite drawings may have to be submitted for each area.
   1. Clearances for maintaining ceiling heights.
   2. Clearances for installation of material and equipment for all trades.
   3. Clearances for installing and maintaining insulation.
   4. Clearances for servicing and maintaining equipment, including tube removal, filter removal, and space for equipment disassembly required for periodic maintenance.
   5. Equipment connections and support details.
   6. Penetrations thru block walls and Pre-cast walls.
   7. Exterior wall and foundation penetrations.
   8. Fire-rated wall and floor penetrations.
   9. Sizes and locations of required concrete pads and bases.
   10. Valve stem movement.
   11. Dimensional locations of pipe sleeves passing through floor/roof slabs.
   12. Locations of wall and ceiling access panels where required for access to mechanical equipment.

13. Reflected ceiling plans to integrate installations of light fixtures, grilles, registers, and diffusers, sprinklers, communication systems, and other ceiling mounted components.
14. Both new and existing structural elements.

1.09 COST BREAKDOWN

A. Submit a cost breakdown for each claim according to General Conditions of the Contract. Include project name, location, Architect/Engineer, Contractor and date.
   1. List the cost breakdown for labor and material separately and include a total.
   2. Breakout and detail the cost according to specification sections.

1.10 SUBSTITUTIONS AND PRIOR APPROVAL REQUESTS

A. Equipment manufacturers where indicated on the drawings are the basis of design. The contractor accepts responsibility for all design implications when providing approved equipment other than the design basis.

B. Electrical Characteristics for HVAC Equipment: Equipment of higher electrical characteristics than the basis of design may be furnished provided such proposed equipment is approved in writing and connecting electrical services, circuit breakers, and conduit sizes are appropriately modified at the cost of the contractor. If minimum energy rating or efficiencies are specified, equipment shall comply with those requirements. Cost implications to other trades are the responsibility of the contractor.

C. Dimensional and Wight Changes: Substituted equipment with dimensions or weight different than the basis of design may be furnished provided such proposed equipment is approved in writing. The contractor is responsible for verifying and coordinating proposed equipment such that it maintains the design intent for access and serviceability and reserves space for future equipment where required. Cost implications to other trades are the responsibility of the contractor.

D. Bids shall be based on the exact materials specified, those listed scheduled on the drawings, or on materials which have been accepted as equivalent. The specified/scheduled products have been used in the design of the project and the preparation of the drawings and specifications as such establish minimum standards of function, dimension, appearance and quality necessary and requisite for this project, which substitutes must meet to be considered acceptable. The burden of proof of equality rests with the party making the request.

E. Requests for substitution shall be in writing and shall be received by the Engineer not later than 10 days before bid opening date. Materials not specified or accepted as equivalent shall not be acceptable for installation.

F. Each prior approval request for substitution shall include and meet the following requirements:
   1. The name and model of the material or equipment for which an equivalent is being proposed and a complete description of the proposed equivalent including drawings, cuts sheets, equipment performance capacity and test data, equipment weights, electrical and any other information necessary for a complete evaluation.
   2. A written comparison listing any deviations from the scheduled equipment and/or the specification requirements must also be provided prior to any proposed substitution will be evaluated.
   3. A written statement setting forth any changes in other materials, equipment, electrical, structural and/or other Work in which incorporation of the equivalent may be required shall be included.
   4. Material and/or equipment requests which do not meet the above requirements will not be evaluated or approved.

5. The burden of proof of the merit of the proposed equivalent is upon the proposer. Any and all extra costs associated with the equipment change and affecting architectural, structural, mechanical, plumbing or electrical work shall be responsibility of the entity requesting the substitution.
6. The Engineer's decision of approval or disapproval of a proposed equivalent is final.

G. Final approval of all equipment shall be contingent on shop drawing acceptance, compliance with the specifications and performance criteria as scheduled and acceptable installation. General approval to bid a product does not relieve the Supplier or Contractor of meeting specific specification requirements.

H. The Mechanical Contractor shall pay, provide, install and be responsible for extra materials required or any other trade due to this use of alternate accepted equipment which has installation requirements different than the specified equipment. The Mechanical Contractor shall pay other trades for any extra work they are involved in due to this substitution of equipment.

I. If substitutions of controls or equipment require any changes in the architectural, structural, mechanical, plumbing or electrical work from that shown on the drawings, the extra cost of the equipment or architectural, structural, mechanical, plumbing or electrical work shall be responsibility of the Contractor requesting the substitution. All substitutions shall be prior approved by the Architect or Engineer before purchase by the contractor.

J. Where any redesign of electrical, mechanical or other work is required due to substitution, arrangement or equipment layout other than herein specified or shown:
1. Arrange for required redesign by Architect and Engineer.
2. Pay all costs for such redesign.

1.11 SUBMITTALS

A. Refer to individual product and equipment specification sections for detailed submittal requirements.

B. The mechanical and electrical contractor shall have an onsite meeting prior to installation to review all shop drawings and verify all electrical requirements with the electrical contractor. The mechanical contractor shall be responsible for coordinating and setting up meeting and sharing of mechanical equipment electrical requirements with electrical contractor prior to when construction is set to begin and equipment is to be ordered.

C. The electrical contractor shall sign off on all mechanical shop drawings for electrical requirements prior to ordering equipment.

1.12 RECORD DOCUMENTS

A. Prepare record documents in accordance with the requirements in Division 1 Section "Project Record Documents." In addition to the requirements specified in Division 1, at a minimum the contractors shall:
1. Maintain an on-site set of drawings to record actual revisions to the work being performed on site. Revisions shall be shown on the documents legibly to reflect actual on-site changes to the documents.
2. Revisions shall be show on the documents in a contrasting color (red).
3. Revisions shall be updated to the on-site plan daily.
4. Ensure all revisions and documentation is complete and accurate, enabling future reference by Owner.

B. Refer to specific sections for additional record documentation.

1.13 MAINTENANCE MANUALS

A. Prepare maintenance manuals in accordance with Division 1 Section "Operating, Maintenance, and Warranty Data". Submit copies for review by Architect/Engineer. In addition to the requirements specified in Division 1, include the following information:
   1. Descriptive summary of function, normal system operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts.
   2. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.
   3. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.
   4. Servicing instructions and lubrication charts and schedules.
   5. Warranty information for all mechanical items shall be included in one tabbed section.

1.14 FIRE SAFETY PRECAUTIONS

A. The Contractors shall exercise extreme care to maintain and exercise adequate fire safety precautions throughout the work. This shall include providing sufficient fire fighting devices,
   1. watchmen, standby helpers or other precautions during construction, in use of temporary heat, welding, brazing, sweating, testing or other phases of work.

B. At all times, access shall be maintained for fire department trucks to the building.

C. All welding brazing, cutting and sweating operations performed in vicinity of or accessible to combustible materials shall be adequately protected to make certain that sparks or hot slag does not reach the combustible material and start a fire.

D. All glass, glazed materials and other finish, in the vicinity of welding, brazing and cutting, shall be masked by the Contractor performing the welding work.

E. When necessary to do cutting, welding, brazing, sweating and similar work in vicinity of wood, in shafts, or vicinity of any combustible material (and the combustible material cannot be removed), the materials shall be adequately protected with fire resistant blankets or similar approved coverings. In addition, a helper shall be stationed nearby with proper fire extinguishers (provided by the Contractor performing the work) to guard against sparks and fire.

F. Whenever combustible materials have been exposed to sparks, molten metal, hot slag or splatter, a person shall be kept at the place of work to make sure the smoldering fires have not been started. Whenever cutting or welding operations are carried on in a vertical pipe shaft, a person to act as a fireguard shall be employed to examine all floors below the point of cutting or welding. This fireguard shall be kept on duty after completion of work to guard against fires and shall examine each level after this time, prior to leaving. There shall be no exceptions to this requirement and failure to comply will be construed as negligence.

1.15 EQUIPMENT REBATES

A. The contractor shall be responsible for applying for and leading the rebate application process for all eligible equipment / systems within the project on behalf of the owner.

B. The contractor shall provide all receipts, invoicing, counts, site data, etc as required to procure equipment rebates

C. The contractor shall forward the filled out application and all necessary rebate “back-up” requirements to the owner at the completion of the project.

1.16 PERSONAL SAFETY REQUIREMENTS

A. A. The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions required in connection with his work, including regulations of the Occupational Safety and Health Administration (OSHA) and other governing agencies.

1.17 TESTING, ADJUSTING AND BALANCING

A. All domestic hot water circulation systems will be balanced by an independent test and balance agency hired by the mechanical contractor. The scope of the testing and balancing work includes functional performance testing of all mechanical systems. Deficiency reports will be distributed directly to the contractor on an ongoing basis. Exceptions taken to specific direction issued by the testing agency shall be brought to the attention of the engineer by the installing contractor.

B. The Contractor shall be certain that all systems are ready for proper operation prior to balancing and adjusting with clean filter and other system elements, e.g., coils. Temperature control calibration, electrical interface, etc., shall also be complete prior to balancing and adjusting. All equipment shall be freshly oiled. The Contractor shall instruct his employees and subcontractors to leave all balancing devices in a wide open position and free all operating arms and adjustments so that they
   1. can be easily operated. The contractor shall write a letter to the testing agency indicating that each of the areas defined by the construction schedule is complete and ready for balancing.

C. The Contractor shall provide and coordinate the services of qualified, responsible subcontractors, suppliers and personnel as required to correct, repair, and/or replace any and all deficient items or conditions found during the course of this project, including the testing, adjusting, and balancing period.

D. In order that all systems may be properly tested, balanced, and adjusted as required herein by these Specifications, the Contractor shall operate the systems at his expense for the length of time necessary to properly verify their completion and readiness for TAB.

E. Project Contract completion schedules shall allow for sufficient time to permit the completion of TAB services prior to Owner occupancy. The Contractor shall allow adequate time for the testing and balancing activities of the Owner provided services, during the construction period, and prior to Substantial Completion as defined in the Uniform General Conditions of this Construction Document.

F. The Drawings and Specifications indicate valves, dampers, and miscellaneous adjustment devices for the purpose of adjustment to obtain optimum operating conditions, and it will be the responsibility of the Contractor to install these devices in a manner that will leave them accessible and readily adjustable. Should any such device not be readily accessible, the Contractor shall provide access as requested by the TAB Firm. Also, any malfunction encountered by TAB personnel and reported to the Contractor shall be corrected by the Contractor immediately so that the balancing work can proceed with the minimum of delays.

1.18 TEMPORARY HEAT/EQUIPMENT OPERATION

A. Provide temporary gas meter and connections to equipment provided by the General Contractor as required for temporary heat.

B. Warranties:
   1. The Contractor shall provide extended warranties for all equipment and mechanical system components operated prior to the date of substantial completion. The Contractor shall obtain in writing from the manufacturer extended warranties for all equipment such that the Owner's warranty starts at the date of substantial completion in accordance with the General Division 1 requirements. Any additional costs shall be the burden of the Contractor.

PART 2: PRODUCTS

2.01 SUBMITTALS

A. Submit product data for the following in accordance with requirements of Division 1 Specification Section 01300, “Submittals.”
   1. Transition fittings.
   2. Dielectric fittings.
   3. Mechanical sleeve seals.
   4. Escutcheons.

B. Welding certificates.

2.02 QUALITY ASSURANCE

A. Steel Support Welding: Qualify processes and operators according to AWS D1.1, "Structural Welding Code--Steel."

B. Steel Pipe Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."
   1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."
   2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.

C. Electrical Characteristics for Plumbing Equipment: Equipment of higher electrical characteristics may be furnished provided such proposed equipment is approved in writing and connecting electrical services, circuit breakers, and conduit sizes are appropriately modified. Required electrical modifications must be approved by the Electrical Engineer and be provided at no additional cost to the Owner. If minimum energy ratings or efficiencies are specified, equipment shall comply with requirements.

2.03 DELIVERY, STORAGE, AND HANDLING

A. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.

B. Store plastic pipes protected from direct sunlight. Support to prevent sagging and bending.

C. Storage of materials and equipment shall not impede the work of other contracts.

D. Handling of equipment and products shall be according to manufacturers instructions and in compliance with the articles of their warranty.

E. Protect products from weather, unless product is slated for exterior installation. If outdoor storage is necessary, support products off the ground or pavement in watertight enclosures.

2.04 COORDINATION

A. Arrange for pipe spaces, chases, slots, and openings in building structure during progress of construction, to allow for plumbing installations.

B. Coordinate installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components as they are constructed.

C. Coordinate requirements for access panels and doors for plumbing items requiring access that are concealed behind finished surfaces. Access panels and doors are specified in Division 08 Section "Access Doors and Frames."

2.05 PIPE, TUBE, AND FITTINGS

A. Refer to individual Division 22 piping Sections for pipe, tube, and fitting materials and joining methods.

B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

2.06 JOINING MATERIALS

A. Refer to individual Division 22 piping Sections for special joining materials not listed below.

B. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.
   1. ASME B16.21, nonmetallic, flat, asbestos-free, 1/8-inch maximum thickness unless thickness or specific material is indicated.
      a. Full-Face Type: For flat-face, Class 125, cast-iron and cast-bronze flanges.
      b. Narrow-Face Type: For raised-face, Class 250, cast-iron and steel flanges.
   2. AWWA C110, rubber, flat face, 1/8 inch thick, unless otherwise indicated; and full-face or ring type, unless otherwise indicated.

C. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.

D. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.

E. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.

F. Brazing Filler Metals: AWS A5.8, BCuP Series, copper-phosphorus alloys for general-duty brazing, unless otherwise indicated; and AWS A5.8, BAg1, silver alloy for refrigerant piping, unless otherwise indicated.

G. Welding Filler Metals: Comply with AWS D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

H. Solvent Cements for Joining Plastic Piping:
   1. ABS Piping: ASTM D 2235.
   2. CPVC Piping: ASTM F 493.
   3. PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.
   4. PVC to ABS Piping Transition: ASTM D 3138.

I. Fiberglass Pipe Adhesive: As furnished or recommended by pipe manufacturer.

2.07 TRANSITION FITTINGS

A. AWWA Transition Couplings: Same size as, and with pressure rating at least equal to and with ends compatible with, piping to be joined.

B. Plastic-to-Metal Transition Fittings: One-piece fitting with manufacturer's Schedule 80 equivalent dimensions; one end with threaded brass insert, and one solvent-cement-joint end.

C. Plastic-to-Metal Transition Adaptors: One-piece fitting with manufacturer's SDR 11 equivalent dimensions; one end with threaded brass insert, and one solvent-cement-joint end.

D. Plastic-to-Metal Transition Unions: MSS SP-107, four-part union. Include brass end, solvent-cement-joint end, rubber O-ring, and union nut.

E. Flexible Transition Couplings for Underground Nonpressure Drainage Piping: ASTM C 1173 with elastomeric sleeve, ends same size as piping to be joined, and corrosion-resistant metal band on each end.

2.08 DIELECTRIC FITTINGS

A. Description: Combination fitting of copper alloy and ferrous materials with threaded, solder-joint,
   1. plain, or weld-neck end connections that match piping system materials.

B. Insulating Material: Suitable for system fluid, pressure, and temperature.

C. Dielectric Unions: Factory-fabricated, union assembly, for 250-psig minimum working pressure at 180 deg F.

D. Dielectric Flanges: Factory-fabricated, companion-flange assembly, for 150- or 300-psig minimum working pressure as required to suit system pressures.

E. Dielectric-Flange Kits: Companion-flange assembly for field assembly. Include flanges, full-face- or ring-type neoprene or phenolic gasket, phenolic or polyethylene bolt sleeves, phenolic washers, and steel backing washers.

F. Dielectric Couplings: Galvanized-steel coupling with inert and noncorrosive, thermoplastic lining; threaded ends; and 300-psig minimum working pressure at 225 deg F.

G. Dielectric Nipples: Electroplated steel nipple with inert and noncorrosive, thermoplastic lining; plain, threaded, or grooved ends; and 300-psig minimum working pressure at 225 deg F.

2.09 MECHANICAL SLEEVE SEALS

A. Description: Modular sealing element unit, designed for field assembly, to fill annular space between pipe and sleeve.
   1. Sealing Elements: EPDM interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
   2. Pressure Plates: Stainless steel. Include two for each sealing element.
   3. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.10 SLEEVES

A. Galvanized-Steel Sheet: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.

B. Steel Pipe: ASTM A 53, Type E, Grade B, Schedule 40, galvanized, plain ends.

C. Cast Iron: Cast or fabricated "wall pipe" equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.

D. Stack Sleeve Fittings: Manufactured, cast-iron sleeve with integral clamping flange. Include clamping ring and bolts and nuts for membrane flashing.

2.11 ESCUTCHEONS

A. A. Description: Manufactured wall and ceiling escutcheons and floor plates, with an ID to closely fit around pipe, tube, and insulation of insulated piping and an OD that completely covers opening. Provide with polished chrome plated finish.

2.12 GROUT

A. Description: ASTM C 1107, Grade B, nonshrink and nonmetallic, dry hydraulic-cement grout.
   1. Characteristics: Post-hardening, volume-adjusting, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications.
   2. Design Mix: 5000-psi, 28-day compressive strength.
   3. Packaging: Premixed and factory packaged.

PART 3: EXECUTION

3.01 PIPING SYSTEMS - COMMON REQUIREMENTS

A. Install piping according to the following requirements and Division 22 Sections specifying piping systems.

B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.

C. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.

D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

F. Install piping to permit valve servicing.

G. Install piping at indicated slopes.

H. Install piping free of sags and bends.

I. Install fittings for changes in direction and branch connections.

J. Install piping to allow application of insulation.

K. Select system components with pressure rating equal to or greater than system operating pressure.

L. Install escutcheons for penetrations of walls, ceilings, and floors:

M. Sleeves are not required for core-drilled holes.

N. Install sleeves for pipes passing through concrete and masonry walls, gypsum-board partitions, and concrete floor and roof slabs.
   1. Cut sleeves to length for mounting flush with both surfaces.
      a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches above finished floor level. Extend cast-iron sleeve fittings below floor slab as required to secure clamping ring if ring is specified.
   2. Install sleeves in new walls and slabs as new walls and slabs are constructed.
   3. Install sleeves that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation. Use the following sleeve materials:
      a. Steel Sheet Sleeves: For pipes NPS 6 and larger, penetrating gypsum-board partitions.
      b. Stack Sleeve Fittings: For pipes penetrating floors with membrane waterproofing. Secure flashing between clamping flanges. Install section of cast-iron soil pipe to extend sleeve to 2 inches above finished floor level. Refer to Division 07 Section "Sheet Metal Flashing and Trim" for flashing.
   4. Except for underground wall penetrations, seal annular space between sleeve and pipe or pipe insulation, using joint sealants appropriate for size, depth, and location of joint. Refer to Division 07 Section "Joint Sealants" for materials and installation.

O. Aboveground, Exterior-Wall Pipe Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
   1. Install steel pipe for sleeves smaller than 6 inches in diameter.
   2. Install cast-iron "wall pipes" for sleeves 6 inches and larger in diameter.
   3. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

P. Underground, Exterior-Wall Pipe Penetrations: Install cast-iron "wall pipes" for sleeves. Seal pipe penetrations using mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
   1. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

Q. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Refer to Division 07 Section "Penetration Firestopping" for materials.

R. Verify final equipment locations for roughing-in.

S. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.

3.02 PIPING JOINT CONSTRUCTION

A. Join pipe and fittings according to the following requirements and Division 22 Sections specifying piping systems.

B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free
   1. solder alloy complying with ASTM B 32.

E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.

F. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
   1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
   2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

G. Welded Joints: Construct joints according to AWS D10.12, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.

H. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

I. Plastic Piping Solvent-Cement Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
   1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
   2. ABS Piping: Join according to ASTM D 2235 and ASTM D 2661 Appendixes.
   3. CPVC Piping: Join according to ASTM D 2846/D 2846M Appendix.
   4. PVC Pressure Piping: Join schedule number ASTM D 1785, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D 2855.
   5. PVC Nonpressure Piping: Join according to ASTM D 2855.
   6. PVC to ABS Nonpressure Transition Fittings: Join according to ASTM D 3138 Appendix.

J. Plastic Pressure Piping Gasketed Joints: Join according to ASTM D 3139.

K. Plastic Nonpressure Piping Gasketed Joints: Join according to ASTM D 3212.

L. PE Piping Heat-Fusion Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join according to ASTM D 2657.
   1. Plain-End Pipe and Fittings: Use butt fusion.
   2. Plain-End Pipe and Socket Fittings: Use socket fusion.

M. Fiberglass Bonded Joints: Prepare pipe ends and fittings, apply adhesive, and join according to pipe manufacturer's written instructions.

3.03 PIPING CONNECTIONS

A. Make connections according to the following, unless otherwise indicated:
   1. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment.
   2. Install flanges, in piping NPS 2-1/2 and larger, adjacent to flanged valves and at final connection to each piece of equipment.
   3. Dry Piping Systems: Install dielectric unions and flanges to connect piping materials of dissimilar metals.
   4. Wet Piping Systems: Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

3.04 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

A. Install equipment to allow maximum possible headroom unless specific mounting heights are not indicated.

B. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.

C. Install plumbing equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.

D. Install equipment to allow right of way for piping installed at required slope.

3.05 PAINTING

A. Painting of plumbing systems, equipment, and components is specified in Division 09 Sections "Interior Painting" and "Exterior Painting."

B. Damage and Touchup: Repair marred and damaged factory-painted finishes with materials and procedures to match original factory finish.

3.06 CONCRETE BASES

A. Concrete Bases: Anchor equipment to concrete base according to equipment manufacturer's written instructions and according to seismic codes at Project.
   1. Construct concrete bases of dimensions indicated, but not less than 4 inches larger in both directions than supported unit.
   2. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of the base.
   3. Install epoxy-coated anchor bolts for supported equipment that extend through concrete base, and anchor into structural concrete floor.
   4. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
   5. Install anchor bolts to elevations required for proper attachment to supported equipment.
   6. Install anchor bolts according to anchor-bolt manufacturer's written instructions.
   7. Use 3000-psi, 28-day compressive-strength concrete and reinforcement as specified in Division 03 Section.

3.07 ERECTION OF METAL SUPPORTS AND ANCHORAGES

A. Refer to Division 05 Section "Metal Fabrications" for structural steel.

B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor plumbing materials and equipment.

C. Field Welding: Comply with AWS D1.1.

3.08 ERECTION OF WOOD SUPPORTS AND ANCHORAGES

A. Cut, fit, and place wood grounds, nailers, blocking, and anchorages to support, and anchor plumbing materials and equipment.

B. Select fastener sizes that will not penetrate members if opposite side will be exposed to view or will receive finish materials. Tighten connections between members. Install fasteners without splitting wood members.

C. Attach to substrates as required to support applied loads.

3.09 GROUTING

A. Mix and install grout for plumbing equipment base bearing surfaces, pump and other equipment base plates, and anchors.

B. Clean surfaces that will come into contact with grout.

C. Provide forms as required for placement of grout.

D. Avoid air entrapment during placement of grout.

E. Place grout, completely filling equipment bases.

F. Place grout on concrete bases and provide smooth bearing surface for equipment.

G. Place grout around anchors.

H. Cure placed grout.

END OF SECTION

PART 1 GENERAL

1.01 **SECTION INCLUDES**

A. Gate valves

B. Check valves

C. Plug valves

D. Safety and relief valves

E. Ball valves

1.02 ABBREVIATIONS

A. IBBM: Iron body, bronze mounted.

B. OS&Y: Outside screw and yoke.

C. WOG: Water, oil, gas.

D. WSP: Working steam pressure.

1.03 SUBMITTALS

A. Product Data: Manufacturer's catalog sheets and specifications for each valve type.

B. Valve Schedule: List type of valve, manufacturer's model number, and size for each service application.

1.04 MAINTENANCE

A. Special Tools:
   1. One wrench for each type and size wrench operated plug valve.

PART 2 PRODUCTS

2.01 VALVES - GENERAL

A. Valve Standardization: Valves from one or more manufacturers may be used, however valves supplied for each specific valve type shall be the product of one manufacturer.

B. Valves shall be first quality, free from all imperfections and defects, with body markings indicating manufacturer and rating.

C. Valve parts of same manufacturer, size and type shall be interchangeable.

D. Manually operated gate, globe and angle valves shall be of rising stem type, unless otherwise specified.

E. Valves which use packing, shall be capable of being packed when wide open and under full working pressure.

F. Size valves the same size as the piping in which they are installed, unless specified otherwise.

2.02 GATE VALVES

A. Type A: 125 psig WSP, 200 psig WOG, bronze body, union bonnet, solid wedge disc, and threaded ends. Acceptable Valves: Crane428UB, Hammond IB617, Jenkins 47CU, Milwaukee 1152, Nibco T13, and Stockham B105.

B. Type C: 125 psig WSP, 200 psig WOG up to 12 inch size, and 150 psig WOG for 14 inch and 16 inch sizes; IBBM OS&Y, bolted bonnet, solid wedge disc, and threaded or flanged ends depending on size. Acceptable Valves: Crane 464-1/2, 465-1/2, Hammond IR1140, Milwaukee F2885, Nibco T6170 & F6170, and Stockham G620 & G623

C. Type D: 125 psig WSP, 200 psig WOG, bronze body, threaded bonnet, solid wedge disc, and solder ends. Acceptable Valves: Crane 1330, Hammond IB635, Jenkins 991AJ, Milwaukee 149, Nibco S111, and Stockham B108.

2.03 CHECK VALVES

A. Type S: 125 psig WSP, 200 psig WOG, bronze body, brass or bronze trim, horizontal swing, renewable and regrindable disc, and threaded ends. Face discs for cold water service with teflon. Acceptable Valves: Crane 37, Hammond IB940, Jenkins 4092, Milwaukee 509, Nibco T413Y, and Stockham B319Y.

B. Type U: 125 psig WSP, 200 psig WOG, bronze body, brass or bronze trim, horizontal swing, renewable and regrindable disc, and solder ends. Face discs for cold water service with teflon. Acceptable Valves: Crane 1340, Hammond IB912, Jenkins 4093, Milwaukee 1509, Nibco S413Y, and Stockham 309Y.

C. Type V: 125 psig WSP, 200 psig WOG, IBBM, horizontal swing, bolted bonnet, regrindable and renewable seat ring and disc, and threaded or flanged ends depending on size. Discs on valves 4 inch size and larger may be cast iron with bronze face. Acceptable Valves: Crane 372, & 373, Hammond IR1124, Jenkins 623CJ & 624CJ, Milwaukee F2974, Nibco F918, and Stockham G927 & G931.

D. Type W:
   1. Globe Style Silent Check Valve: IBBM or semi-steel with bronze mounting, renewable seat and disc, 18-8 stainless steel spring, and flanged ends.
      a. Acceptable Valves (125 psig flange pressure rating): Apco Series 600, Combination Pump & Valve 20D, Hammond IR9354, Milwaukee 1800, Nibco F910, and Williams Hager 636.
      b. Acceptable Valves (250 psig flange pressure rating): Apco Series 600, Combination Pump & Valve 21D, Milwaukee 1800, Nibco F960, and Williams Hager 636.
   2. Wafer Style Silent Check Valve: IBBM or semi-steel with bronze mounting, renewable seat and disc, 18-8 stainless steel spring, and flanged ends.
      a. Acceptable Valves (125 psig flange pressure rating): Apco Series 300, Combination Pump and Valve 10D, Hammond IR9253, Milwaukee 1400, Nibco W910, and Williams Hager 329 & 375.
      b. Acceptable Valves (250 psig flange pressure rating): Apco Series 300, Combination Pump and Valve 11D, Milwaukee 1400, Nibco W960, and Williams Hager 329 & 375.

2.04 PLUG VALVES

A. Type AA: 200 psig WOG, lubricated type with standard port opening, cast iron or semi-steel body, sealed lubrication system with lubricant fitting and dial indicator, cylindrical plug or teflon tapered plug, lubricant grooves in body or plug, threaded or flanged ends depending on size, and capable of lubrication with valve under pressure and plug in any position.

1. Acceptable Valves:
   a. 1/2 inch to 3 inch size: Homestead 611 & 612, , Resun R1430 & R1431,and Rockwell 142 & 143.
   b. 4 inch size: Homestead 611 & 612, , Resun R1430 & R1431, and Rockwell 142 & 143.
   c. 5 inch size: Homestead 611 & 612, Resun R1431, Rockwell 143, and Walworth 1797F.
   d. 6 inch size: Homestead 611 & 612, , Resun R1431, Rockwell 143.
   e. 8, 10 & 12 inch sizes: Homestead 612G, , Resun R1431WGA, Rockwell 149.
2. Operators:
   a. 6 inch size and Less: Wrench operator.
   b. 8 inch size and Up: Worm gear operator.

B. Type AB: 100 psig WOG, gas cock type with cast iron or bronze body, bronze plug, square head, wrench operator, and threaded ends. Acceptable Manufacturers: Crane, Eclipse Combustion, and McDonald.

2.05 SAFETY AND RELIEF VALVES

A. General Requirements: Valves shall be as specified by ASME Code governing manufacture of such valves within scope of their particular usage, i.e., Heating Boilers, Unfired Pressure Valves, etc., shall be tested, rated and listed, unless otherwise specified. Valves for applications specified shall conform to the ASME Code, Section IV, Heating Boilers and the following:
   1. Valves for combination domestic hot water heater and storage tanks shall conform to the requirements of ASME Code, Section IV and USA Standard Z21.22 and shall be NBB listed. Valves shall be of the temperature - pressure type. Thermostatic element shall, on rising temperature, cause the valve to open at 200 degrees F. and valve shall deliver its rated capacity at 210 degrees F. and close drip tight at 195 degrees F. Valves shall be sized in accordance with Unfired Vessel Code.
   2. End Connections: Unless otherwise specified, safety valves, relief valves and safety relief valves, in sizes 3/4 inch to 3 inches IPS inclusive, may be furnished with male or female pipe thread inlet and female pipe thread outlet; valves over 3 inches IPS must be furnished with 125 lb. or 250 lb. flanged inlet and may be equipped with female threaded or 125 lb. flanged outlet.

2.06 BALL VALVES

A. Type BV: 150 psig WSP, 600 psig WOG, 2 piece bronze body, solid blow-out proof stem, teflon seats, chrome plated brass ball, teflon seals, corrosion resistant steel lever handles with vinyl grips, balancing stop, and threaded or solder ends. Acceptable Manufacturers: Conbraco, Hammond, Milwaukee, Nibco, and Watts.

PART 3 EXECUTION

3.01 INSTALLATION

A. General: Install valves at locations noted on the drawings or specified.

3.02 VALVE APPLICATION SCHEDULE

A. Schedule of valve applications for the different services is as follows:
   1. Cold Water In Buildings and Tunnels (CW) 125 psig and Less:
      a. 3 inch and Less: A or D gates or BV balls, O globes or angles, and S or U checks; or C gates, K globes or angles, and V checks, with solder joint companion flanges.
      b. 4 inch and Up: C gates or BF butterflys, K globes or angles, and V checks.

2. Compressed Air (A) 125 psig and less:
   a. 2 inches and Less: A gates, J globe or angles, and W checks.
   b. 2-1/2 inches and Up: C gates, K globe or angles, and W checks.
3. Domestic Hot Water and Circulating (DHW & DHWC) 125 psig and Less:
   a. 3 inch and Less: A or D gates or BV balls, J or O globes or angles, and S or U checks.
   b. 4 inch and Up: C gates or BF butterflys, K globes or angles, and V checks.
4. Gas - Natural, Manufactured or Mixed Fuel (G) 125 psig and Less:
   a. 2 inch and Less: AB plug valves.
   b. 2-1/2 inch and Up: AA plug valves.
5. Gas, Bottled Liquified Petroleum (BG): A gates, and J globes or angles, with flared or ferrule copper tubing adapters.

END OF SECTION

PART 1 GENERAL

1.01 **SECTION INCLUDES**

A. General support requirements for plumbing piping

B. Support requirements for cast iron piping

C. Pipe support requirements for cast-in-place concrete construction

D. Pipe support requirements for steel/concrete construction

E. Pipe hangers and supports

F. Anchors and attachments

G. Seismic restraint system for piping

H. Fasteners

I. Shop painting and plating

1.02 PRODUCTS FURNISHED BUT NOT INSTALLED UNDER THIS SECTION

A. Companion high density filler pieces for installation over the top 180 degree surface of pipe or tubing, at points of support where a combination clevis hanger, insulation shield and high density insulating saddle are installed.

1.03 RELATED WORK SPECIFIED ELSEWHERE

A. Piping Insulation: Section 220700.

1.04 SUBMITTALS

A. Shop Drawings:
   1. Details of trapeze hangers and upper hanger attachments for piping 4 inches in diameter and over. Include the number and size of pipe lines to be supported on each type of trapeze hanger.
   2. Details of pipe anchors.
   3. Details and method of installing sway braces for cast iron soil pipe.
   4. Drawings identifying seismic locations with corresponding details of pre-approved seismic restraints, with seismic loads and seismic force level (Fp) calculations; pre-engineered and stamped by a New York Licensed Professional Engineer experienced in seismic restraint systems.

B. Product Data: Catalog sheets, specifications and installation instructions for each item specified except fasteners.

C. Quality Control Submittals:
   1. Seismic Restraint Manufacturer’s Qualifications Data:
      a. Name of firm producing the seismic restraints, business address and telephone number.
      b. Period of time firm has been in the business producing seismic restraints, and names and addresses of 3 similar projects that the manufacturer has produced seismic restraints for during the past 5 years.
   2. Company Field Advisor Data:

a. Name, business address and telephone number of Company Field Advisor secured for the required services.
b. Certified statement from the Company listing the qualifications of the Company Field Advisor.
c. Services and each product for which authorization is given by the Company, listed specifically for this project.

3. Manufacturer's Certificate of Compliance for Seismic Restraints: Certificate from seismic restraint manufacturer stating that the restraint and its mounting system or anchorage has been tested or analyzed and meets the requirements of the applicable building codes.

1.05 QUALITY ASSURANCE

A. Regulatory Requirements:
1. Comply with the applicable requirements of the ASME B31 Piping Codes.
2. Unless otherwise shown or specified, comply with the requirements of the Manufacturer's Standardization Society of the Valve and Fittings Industry (MSS) Standards SP-58, and SP-69.
3. Hang and support cast iron soil pipe and fittings in accordance with the recommendations of the Cast Iron Soil Pipe's Institute's (CISPI) Cast Iron Soil Pipe and Fittings Handbook.
4. The contractor shall provide pre-engineered or stamped and signed details (by a New York Licensed Professional Engineer) of seismic restraint systems to meet total design lateral force requirements for support and restraint of mechanical and electrical systems.
5. Seismic components shall be UL listed or California OSHPD (Office of Statewide Health Planning and Development) approved.

B. Seismic Restraint Manufacturer Qualifications: The firm producing the seismic restraints shall be experienced in seismic restraint work and shall have produced seismic restraints for a minimum of 5 years.

C. Company Field Advisor: Secure the services of a Company Field Advisor from seismic restraint manufacturer for the following:
1. Render advice regarding installation and final adjustment of seismic restraint system.
2. Render advice on the suitability of each seismic restraint for its particular application.
3. Inspect completed installation of seismic restraint system and certify with an affidavit that the system is installed in accordance with the Contract Documents and is operating properly.
4. Train facility maintenance personnel on the installation of seismic restraint system and routine maintenance of the system.

PART 2 PRODUCTS

2.01 PIPE HANGERS AND SUPPORTS

A. Combination clevis hanger, pipe insulation shield and vapor barrier jacketed high density insulating saddle with companion high density filler piece.
1. Insulating saddles and filler pieces shall be of the same thickness and materials as the adjoining pipe insulation. Saddles shall cover the lower 180 degrees of the pipe or tubing, and companion filler pieces shall cover the upper 180 degrees of the pipe or tubing. Physical sizes, gages, etc. of the components of insulated hangers shall be in accordance with the following schedule:

PIPE OR TUBING SIZE (Inches)	SHIELD LENGTH (Inches)	SHIELD GAGE	SADDLE LENGTH (Inches)	VAPOR BARRIER JACKET LENGTH (Inches)
Up to 2-1/2	4	16	6	10

3 to 6	4	14	6	10
8 to 14	10	12	12	16
16 and up	10	10	12	16

B. Pipe Insulation Shields: Fabricated of steel, with a minimum arc of 180 degrees, unless otherwise indicated. Shields for use with hangers and supports, with the exception of combination clevis type hangers, shall be in accordance with the following schedule:

PIPE OR TUBING SIZE (Inches)	SHIELD LENGTH (Inches)	SHIELD GAGE
Up to 2-1/2	8	18
3 to 8	10	16
10 to 14	12	12
16 and up	18	10

C. Pipe Covering Protection Saddles: 3/16 inch thick steel, of sufficient depth for the insulation thickness specified, notched so that saddle contact with the pipe is approximately 50 percent of the total axial cross section. Saddles for pipe 12 inches in size and larger shall have a center support.

D. Pipe Hangers: Height adjustable standard duty clevis type, with cross bolt and nut.
   1. Pipe spreaders or spacers shall be used on cross bolts of clevis hangers, when supporting piping 10 inches in size and larger.

E. Adjustable Floor Rests and Base Flanges: Steel.

F. Hanger Rods: Mild, low carbon steel, fully threaded or threaded at each end, with two nuts at each end for positioning rod and hanger, and locking each in place.

G. Riser Clamps: Malleable iron or steel.

H. Rollers: Cast Iron.

2.02 ANCHORS AND ATTACHMENTS

A. Sleeve Anchors (Group II, Type 3, Class 3): Molly's Div./USM Corp. Parasleeve Series, Ramset's Dynabolt Series, or Red Head/Phillips AN, HN, or FS Series.

B. Wedge Anchors (Zinc Plated, Group II, Type 4, Class 1): Hilti's Kwik Bolt Series, Molly's Div./USM Corp. Parabolt PB Series, Ramset's Trubolt T Series, or Red Head/Phillips WS Series.

C. Self-Drilling Anchors (Group III, Type 1): Ramset's RD Series, or Red Head/Phillips S Series.

D. Non-Drilling Anchors (Group VIII, Type 1): Ramset's Dynaset DS Series, Hilti's HDI Series, or Red Head/Phillips J Series.

E. Stud Anchors (Group VIII, Type 2): Red Head/Phillips JS Series.

F. Beam Clamps: Forged steel beam clamp, with weldless eye nut (right hand thread), steel tie rod, nuts, and washers, Grinnell's Fig No. 292 (size for load, beam flange width, and rod size required).

G. Metal Deck Ceiling Bolts: B-Line Systems' Fig. B3019.

H. Continuous Slotted Type Concrete Insert, Galvanized:
   1. Load Rating 800 lbs/ft: Kindorf's D-986.
   2. Load Rating 1500 lbs/ft: Kindorf's D-980.
   3. Load Rating 3000 lbs/ft: Hohmann & Barnard's Inc. Type CS-H.
   4. Load Rating 4500 lbs/ft: Hohmann & Barnard's Inc. Type CS-HD.

I. Threaded Type Concrete Insert: Galvanized ferrous castings, internally threaded to receive 3/4 inch diameter machine bolts.

J. Wedge Type Concrete Insert: Galvanized box-type ferrous castings, designed to accept 3/4 inch diameter bolts having special wedge shaped heads.

2.03 SEISMIC RESTRAINT SYSTEM FOR PIPING

A. General:
   1. Coordinate all structural attachments with the Owner.
   2. Design analysis shall include calculated dead loads, static seismic loads, and capacity of materials utilized for the connection of the equipment or system to the structure.
   3. Analysis shall detail anchoring methods, bolt diameter, and embedment depth.
   4. Design seismic restraint devices to accept without failure the forces calculated per the applicable building code and as specified.
   5. Friction from gravity loads shall not be considered resistance to seismic forces.
   6. Fire protection systems shall meet the requirements of NFPA-13 and NFPA-14 for the building seismic requirements.
   7. Construct seismic supports constructed so that support engagement is maintained.
   8. Stamp seismic supports with manufacturer's name and part number for identification.
   9. Design seismic supports specifically for mitigation of seismic force loads.
   10. Design the stiffness of seismic restraints for mechanical equipment so that the load path for the restraint performs its intended function.
   11. Where possible, utilize components designed with tamper resistant break-off bolt heads or break-off nuts to assure visual verification of proper installation.
   12. Attachment components shall be UL Listed catalog components with published loads designed specifically for seismic application.

B. Type: Pre-engineered seismic restraint system designed to support and restrain piping to meet applicable lateral force requirements.

C. Acceptable Manufacturers:
   1. B-Line.
   2. Mason Industries.
   3. TOLCO Inc.

D. Strut/Channel Bracing: 12 gauge solid steel with no holes, 1-5/8 inches wide x 1-5/8 inches deep of single lengths or stitch-welded back-to-back configurations.

E. Pipe Bracing: Schedule 40 steel pipe.

F. Cable Bracing: Pre-stretched galvanized aircraft cable 7 x 19 strand core.

G. Rigid Seismic Braces For Single Hung Pipe Systems: A12 strut channel or schedule 40 steel pipe.
   1. Maximum Brace Length: 13 feet 1 inches.

H. Rigid Seismic Braces For Trapeze Supported Pipe Systems: A12 strut channel or schedule 40 steel pipe.
   1. Maximum Brace Length: 13 feet 1 inches.

I. Cable Seismic Braces For Single Hung Pipe Systems: Pre-stretched aircraft cable 7 x 19 core.

J. Cable Seismic Braces For Trapeze Supported Pipe Systems: Pre-stretched aircraft cable 7 x 19 core.

K. Structural Attachments for Rigid and Cable Seismic Braces For Single Hung and Trapeze Supported Pipe Systems:
   1. Structural attachments shall be positive.
   2. Do not make structural attachments to the bottom of a bar joist.
   3. Supplemental steel shall be installed for all pre-cast decks less than 4 inches thick
   4. Do not use concrete inserts or continuous concrete insert strut to attach brace.
   5. Wedge type anchors are permitted. The size and embedment depth shall be determined by the supplier of the seismic restraint system and as approved.

L. Vertical Brace Component (up-thrust protection)
   1. Reinforce Vertical Hanger Rod when lengths exceed the following:
      a. 3/8 inch dia rod: 19 inches.
      b. 1/2 inch dia rod: 25 inches.
      c. 5/8 inch dia rod: 31 inches.
      d. 7/8 inch dia rod: 43 inches.
      e. 1 inch dia rod: 50 inches.
      f. 1-1/4 inch dia rod: 62 inches.

2.04 FASTENERS

A. Bolts, Nuts, Washers, Lags, and Screws: Medium carbon steel; size and type to suit application; galvanized for high humidity locations, and treated wood; plain finish for other interior locations. Except where shown otherwise on the Drawings, furnish type, size, and grade required for proper installation of the Work.

2.05 SHOP PAINTING AND PLATING

A. Hangers, supports, rods, inserts and accessories used for pipe supports, unless chromium plated, cadmium plated or galvanized shall be shop coated with metal primer paint. Electroplated copper hanger rods, hangers and accessories may be used with copper pipe or copper tubing.

B. Hanger supports for chromium plated pipe shall be chromium plated brass.

PART 3 EXECUTION

3.01 PREPARATORY WORK

A. Place inserts into construction form work expeditiously, so as not to delay the Work.

3.02 INSTALLATION

A. Do not hang or support one pipe from another or from ductwork.
   1. Do not bend threaded rod.

B. Support all insulated horizontal piping conveying fluids below ambient temperature, by means of hangers or supports with insulation shields installed outside of the insulation.

C. Space hangers or supports for horizontal piping on maximum center distances as listed in the following hanger schedules, except as otherwise specified, or noted on the Drawings.
   1. For Steel, and Threaded Brass Pipe:

PIPE SIZE (Inches)	MAXIMUM SPACING (Feet)
1 and under	8
1-1/4 and 1-1/2	9
2	10
2-1/2 and up	12

   1. For Grooved End Steel Pipe:

PIPE SIZE (Inches)	MAXIMUM SPACING (Feet)
1-1/2 and under	7
2 through 4	10
5 and over	12

   1. No pipe length shall be left unsupported between any two coupling joints.
   2. For Copper Pipe and Copper Tubing:

PIPE OR TUBING SIZE (Inches)	MAXIMUM SPACING (Feet)
1-1/2 and under	6
2 and over	10

   1. For Glass Pipe, and Aluminum Tubing:

TYPE	3/4 INCH AND UNDER	1 INCH AND 1-1/4 INCH	1-1/2 INCH AND OVER
	(Maximum Spacing In Feet)		
Glass Pipe	8	8	8
Plastic Tubing	3	5	7
Aluminum Tubing	3	5	7

   1. For Plastic Tubing:

PIPE OR TUBING SIZE (Inches)	MAXIMUM SPACING (Feet)
Under 2 inch	3

2 inch and over	4

1. Cast Iron Soil Pipe:
   a. General:
      1) Where piping is suspended on centers in excess of 18 inches by means of non-rigid hangers, provide sway bracing to prevent horizontal pipe movement.
      2) Additionally, brace piping 5 inches and larger to prevent horizontal movement and/or joint separation. Provide braces, blocks, rodding or other suitable method at each branch opening, or change of direction
   b. For Bell & Spigot Cast Iron Soil Pipe: Space hangers or support pipe at each joint or on maximum centers of 5 feet. Place hangers or supports as close as possible to joints and when hangers or supports do not come within 1 foot of a branch line fitting, install an additional hanger or support at the fitting.
   c. For Hubless Cast Iron Soil Pipe: Space hangers or support pipe at each joint or on maximum centers of 5 feet. Place hanger or supports as close as possible to joints and when hangers or supports do not come within 1 foot of a branch line fitting, install an additional hanger or support at the fitting.
2. For Directional Changes: Install a hanger or support close to the point of change of direction of all pipe runs in either a horizontal or vertical plane.
3. For Concentrated Loads: Install additional hangers or supports, spaced as required and directed, at locations where concentrated loads such as in-line pumps, valves, fittings or accessories occur, to support the concentrated loads.
4. For Branch Piping Runs and Runouts Over 5 feet In Length: Install a minimum of one hanger, and additional hangers if required by the hanger spacing schedules.
5. Parallel Piping Runs: Where several pipe lines run parallel in the same plane and in close proximity to each other, trapeze hangers may be submitted for approval. Base hanger spacing for trapeze type hangers on the smallest size of pipe being supported. Design the entire hanger assembly based on a safety factor of five, for the ultimate strength of the material being used.
6. Support floor drain traps from the overhead construction, with hangers of type and design as required and approved. Overhead supports are not required for floor drain traps installed directly below earth supported concrete floors.

D. Size hanger rods in accordance with the following:

PIPE OR TUBING SIZE (Inches)	**SINGLE ROD HANGER SIZE (Inches)**		**DOUBLE ROD HANGER SIZE (Inches)**	
	PIPE	**TUBING**	**PIPE**	**TUBING**
1/2 to 2	3/8	1/4	3/8	1/4
2-1/2 and 3	1/2	3/8	3/8	1/4
4 and 5	5/8	1/2	1/2	3/8
6	3/4	1/2	5/8	1/2
8, 10 and 12	7/8	5/8	3/4	5/8

1. Size hanger rods, for piping over 12 inches in size and multiple line supports, based on a safety factor of five for the ultimate strength of the materials being used.
2. Secure hanger rods as follows: Install one nut under clevis, angle or steel member; one nut on top of clevis, angle or steel member; one nut inside insert or on top of upper hanger attachment and one nut and washer against insert or on lower side of upper hanger

attachment. A total of four nuts are required for each rod, two at upper hanger attachment and two at hanger.

E. Vertical Piping:
   1. Support vertical risers of piping systems, by means of heavy duty hangers installed close to base of pipe risers, and by riser clamps with extension arms at intermediate floors, with the distance between clamps not to exceed 25 feet, unless otherwise specified. Support pipe risers in vertical shafts equivalent to the aforementioned. Install riser clamps above floor slabs, with the extension arms resting on floor slabs. Provide adequate clearances for risers that are subject to appreciable expansion and contraction, caused by operating temperature ranges.
   2. Support extension arms of riser clamps, secured to risers to be insulated for cold service, 4 inches above floor slabs, to allow room for insulating and vapor sealing around riser clamps.
   3. Support cast iron risers, by means of heavy duty hangers installed close to the base of the pipe risers, and 1/4 inch thick malleable iron or steel riser clamps with extension arms at each floor level, with the distance between clamps not to exceed 25 feet. Support cast iron risers in vertical shafts equivalent to the aforementioned.
   4. Support hubless cast iron risers, by means of heavy duty hangers installed close to the base of the pipe risers, and by malleable iron or steel riser clamps with the extension arms at each floor level, with the distance between clamps or intermediate supports not to exceed 12 feet. Support risers in vertical shafts equivalent to the aforementioned.

F. Floor Supports: Install adjustable yoke rests with base flanges, for the support of piping, unless otherwise indicated on the Drawings. Install supports in a manner, which will not be detrimental to the building structure.

G. Underground Pipe Supports: Firmly bed pipe laid underground, on solid ground along bottom of pipe. Install masonry piers for pipe laid in disturbed or excavated soil or where suitable bearing cannot be obtained. Support pipe, laid proximate to building walls in disturbed or excavated soil, or where suitable bearing cannot be obtained, by means of wall brackets or hold-fasts secured to walls in an approved manner.

3.03 UPPER HANGER ATTACHMENTS

A. General:
   1. Secure upper hanger attachments to overhead structural steel, steel bar joists, or other suitable structural members.
   2. Do not attach hangers to steel decks that are not to receive concrete fill.
   3. Do not attach hangers to precast concrete plank decks less than 2-3/4 inches thick.
   4. Do not use flat bars or bent rods as upper hanger attachments.

B. Attachment to Steel Frame Construction: Provide intermediate structural steel members where required by pipe support spacing. Select steel members for use as intermediate supports based on a minimum safety factor of five.
   1. Do not use drive-on beam clamps.
   2. Do not support piping over 4 inches in size from steel bar joists. Secure upper hanger attachments to steel bar joists at panel points of joists.
   3. Do not drill holes in main structural steel members.
   4. Beam clamps, with tie rods as specified, may be used as upper hanger attachments for the support of piping, subject to clamp manufacturer’s recommended limits.

C. Attachment to Concrete Filled Steel Decks:
   1. New Construction: Install metal deck ceiling bolts.
   2. Existing Construction: Install welding studs (except at roof decks). Do not support a load in excess of 250 lbs from any single welded stud.

3. Do not attach hangers to decks less than 2-1/2 inches thick.

D. Attachment to Cast-In-Place Concrete: Secure to overhead construction by means of cast-in-place concrete inserts.

E. Attachment to Existing Cast-In-Place Concrete:
   1. For piping up to a maximum of 4 inches in size, secure hangers to overhead construction with self-drilling type expansion shields and machine bolts.
   2. Secure hangers to wall or floor construction with single unit expansion shields or self-drilling type expansion shields and machine bolts.

F. Attachment to Cored Precast Concrete Decks (Flexicore, Dox Plank, Spancrete, etc.): Toggle bolts may be installed in cells for the support of piping up to a maximum of 2-1/2 inches in size.

G. Attachment to Hollow Block or Hollow Tile Filled Concrete Decks:
   1. New Construction: Omit block or tile and pour solid concrete with cast-in-place inserts.
   2. Existing Construction: Break out block or tile to access, and install machine bolt anchors at highest practical point on side of web.

H. Attachment to Waffle Type Concrete Decks:
   1. New Construction: Install cast-in-place inserts.
   2. Existing Construction: Install machine bolt expansion anchors at highest practical point on side of web.

I. Attachment to Precast Concrete Tee Construction:
   1. New Construction: Tee hanger inserts between adjacent flanges, except at roof deck without concrete fill.
   2. Existing Construction: Dual unit expansion shields in webs of tees. Install shields as high as possible in the webs.
      a. Exercise extreme care in the field drilling of holes to avoid damage to reinforcing.
      b. Do not use powder driven fasteners.

3.04 ANCHORS, RESTRAINTS, RIGID SUPPORTS, STAYS AND SWAY BRACES

A. Cast Iron Soil Piping Systems:
   1. Where piping is suspended on centers in excess of 18 inches by means of non-rigid hangers, provide sway braces, of design, number and location in accordance with the Cast Iron Soil Pipe Institute’s Cast Iron Soil Pipe and Fittings Handbook to prevent horizontal pipe movement.
   2. Additionally, brace piping 5 inches and larger to prevent horizontal movement and/or joint separation. Provide braces, blocks, rodding or other suitable method at each branch opening, or change of direction in accordance with the Cast Iron Soil Pipe Institute’s Cast Iron Soil Pipe and Fittings Handbook to prevent horizontal pipe movement.

3.05 PIPING IN TUNNELS

A. Support piping in tunnels on adjustable stanchions, fabricated in accordance with the details on the Drawings, unless otherwise indicated. Install, secure and be responsible for the proper locations of all cast-in-place inserts and stanchion supports, in ample time so as not to delay construction Work. Secure tops of stanchions to overhead construction, as required and approved.

3.06 COMBINATION CLEVIS HANGER, PIPE INSULATION SHIELD AND VAPOR BARRIER JACKETED HIGH DENSITY INSULATING SADDLES

A. Install a combination clevis hanger, pipe insulation shield and vapor barrier jacketed high density insulating saddles, at all points of support for piping or tubing to be insulated for cold service. Furnish companion high density vapor barrier jacketed saddle pieces, of the same material, thickness and length, for installation over the top 180 degree surface of pipe or tubing, at each point of support where an insulated clevis hanger is utilized.

3.07 PIPE INSULATION SHIELDS

A. Unless otherwise specified, install a pipe insulation shield, at all points of support. Center shields on all hangers and supports outside of high density insulation insert, and install in such a manner so as not to cut, or puncture jacket.

3.08 PIPE COVERING PROTECTION SADDLES

A. Install pipe covering protection saddles at all points of support, for steel piping 6 inches in size and larger, insulated with hot service insulation. Weld saddles to piping to insure movement with pipe.

3.09 SEISMIC RESTRAINT SYSTEMS

A. General:
   1. Install seismic restraints in accordance with seismic restraint manufacturer's printed installation instructions and guidelines unless otherwise specified.
   2. Do not use powder-actuated fasteners for seismic restraint anchorage in tension applications.
   3. Laterally support vertical risers with riser clamps at each floor unless otherwise specified.
   4. When systems cross building seismic separation points, pass between buildings, or are supported from different portions of the building, install to allow differential support displacements without damaging the pipe, equipment or support connections. Install pipe loops, anchors, offsets, and guides as required to provide specified capability of motion and limit movement of adjacent piping.
   5. Do not brace seismic bracing to different parts of the building that may respond differently during seismic activity.
   6. Provide adequately sized openings in walls, floors, and ceilings for anticipated seismic movement. Provide fire stopping in fire-rated walls.
   7. Seismic restraint installations shall not cause any modifications in the positioning of equipment or piping resulting in stresses or misalignment.
   8. No rigid connections between equipment, piping, duct, or conduit shall be made to the building structure that degrades the noise and vibration-isolation system specified.
   9. Bracing attached to structural members may present additional stresses. Submit loads to the Owner.
   10. Provide vertical stiffening components to support rods when necessary to accept compressive loads. Welding of components to vertical support rods is not acceptable.
   11. Clevis supported pipe must have cross-bolt support at each seismic bracing location.
   12. Notify Owner if any discrepancies between the specifications and field conditions prior to installation.

B. Seismic Restraints for Piping:
   1. Trapeze assemblies supporting pipes shall be braced considering the total weight of the pipes on the trapeze.
   2. Provide transverse bracing at 40 ft. maximum spacing for welded steel pipe, brazed copper pipe or grooved piping with UL 213 listed connections.

   a. Traverse bracing for threaded steel or copper pipe or non-listed UL grooved connections shall not exceed 20 ft. maximum.
3. Provide longitudinal bracing at 80 ft. maximum spacing for welded steel pipe, brazed copper pipe or grooved piping with UL 213 listed connections.
   a. Traverse bracing for threaded steel or copper pipe or non-listed UL grooved connections shall not exceed 40 ft. maximum.
4. Transverse piping restraints for one pipe section may also act as a longitudinal restraint for a pipe section of the same size connected perpendicular to it if the restraint is installed within 24-inches of the elbow centerline or tee or combined stresses are within allowable limits at longer distances.
5. Branch line piping shall not be used to brace main piping.
   a. No larger diameter pipe shall be braced by a smaller diameter pipe.
6. Attach all longitudinal seismic braces directly to piping.
   a. Encapsulate clamp and brace with insulation equal to that on the pipe.
7. Use hold down clamps to attach pipe to trapeze hangers before installing seismic restraints.
8. Brace vibration isolated piping with cables to allow flexibility.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General concrete pad requirements

B. Requirements for exterior pads

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Subbase for Concrete Pads: Section 310000.

1.03 REFERENCES

A. Except as shown or specified otherwise, the Work of this Section shall conform to the requirements of Specifications for Structural Concrete for Buildings ACI 301-99 of the American Concrete Institute.

1.04 SUBMITTALS

A. Submittals Package: Submit product data for design mix and materials for concrete specified below at the same time as a package.

B. Shop Drawings: Placing drawings for bar reinforcement.

C. Product Data:
   1. Concrete design mix with name and location of batching plant.
   2. Portland Cement: Brand and manufacturer's name.
      a. Fly Ash: Name and location of source, and applicable AHJ test numbers.
   3. Air-Entraining Admixture: Brand and manufacturer's name.
   4. Aggregates: Name and location of source, and applicable AHJ test numbers.
   5. Bonding Agent (Adhesive): Brand and manufacturer's name, and preparation and application instructions.

D. Samples:
   1. Fabric Reinforcement: 8 inches square.
   2. Bar Supports: Full size.

E. Quality Control Submittals:
   1. Certificates: Bar reinforcement manufacturer's certification that bar material conforms with ASTM A 615 and specified grade.

1.05 STORAGE

A. Store materials as required to insure the preservation of their quality and fitness for the Work.

PART 2 PRODUCTS

2.01 MATERIALS

A. Anchor Bolts: Standard bolts, ASTM A 307, with lock washers and nuts.

B. Steel Plates: ASTM A 36.

C. Sleeves: Steel Pipe, Schedule 40, black, ASTM A 53.

D. Steel Shims and Fillers: ASTM A 569.

E. Reinforcement: Furnish the following unless otherwise indicated on the Drawings:
   1. Fabric Reinforcement: ASTM A 185 welded wire fabric, 6 x 6 - W2.9 x W2.9 fabricated into flat sheets unless otherwise indicated.
   2. Bar Reinforcement: ASTM A 615, Grade 60, deformed.
   3. Metal Bar Supports: Galvanized or AISI Type 430 stainless steel, and without plastic tips.
   4. Tie Wire: Black annealed wire, 16 gage minimum.

F. Fly Ash: ASTM C 618, including Table 1A (except for footnote A), Class F except that loss on ignition shall not exceed 4.0 percent.

2.02 PROPORTIONING OF CONCRETE MIXES

A. Compressive Strength: Minimum 4000 psi.

B. Weight: Normal.

C. Durability: Concrete shall be air-entrained. Design air content shall be 6 percent by volume, with an allowable tolerance of plus or minus 1.5 percent for total air content. Entrained air shall be provided by use of an approved air-entraining admixture. Air-entrained cement shall not be used.

D. Slump: Between 2 inches and 4 inches.

E. Admixtures: Do not use admixtures in concrete unless specified or approved in writing by the Owner.

F. Selection of Proportions: Concrete proportions shall be established on the basis of previous field experience or laboratory trial batches, unless otherwise approved in writing by the Owner. Proportion mix with a minimum cement content of 611 pounds per cubic yard for 4000 psi concrete.
   1. Optional Material: Fly ash may be substituted for (Portland) cement in normal weight concrete up to a maximum of 15 percent by weight of the required minimum (Portland) cement. If fly ash is incorporated in a concrete design mix, make necessary adjustments to the design mix to compensate for the use of fly ash as a partial replacement for (Portland) cement.
      a. Adjustments shall include the required increase in air-entraining admixture to provide the specified air content.

2.03 FABRICATION OF ANCHOR BOLT ASSEMBLIES

A. Bolts: Diameter 1/8 inch less than the bolt holes in the equipment supports and length equal to the depth of the pad minus 1 inch plus the additional length required to provide full thread through nuts after shims, equipment, and washers are in place.

B. Sleeves: Diameter 1/2 inch larger than the bolt diameter and length as required to extend from the head of the bolt to the top of the pad.

C. Plates: 3 x 3 x 1/4 inch steel plate.

D. Weld a plate to the head end of a bolt. Center the bolt in a sleeve and tack-weld the sleeve to the plate.

PART 3 EXECUTION

3.01 EXAMINATION AND PREPARATION

A. Concrete materials, reinforcement, forms, and earth which will be in contact with fresh concrete shall be free from frost at the time of concrete placement.

3.02 INSTALLING ANCHOR BOLTS AND SLEEVES

A. Install anchor bolts (with sleeves) for all bolt holes in equipment supports.

B. Accurately position and securely support anchor bolts and sleeves prior to placing concrete. Support head of bolt 1 inch above bottom of pad. Temporarily close open end of sleeves to prevent entry of concrete.

C. Grout anchor bolts in sleeves with cement grout or approved shrink-resistant grout after final positioning.

3.03 REINFORCING

A. Except where other reinforcement is shown on the Drawings, install welded wire fabric at mid-depth of each pad, extending to 1 inch from perimeter of pad.

3.04 FINISHES

A. Formed Surfaces: Provide a smooth rubbed finish, with rounded or chamfered external corners, on all concrete surfaces exposed to view.

B. Unformed Surfaces: Provide a troweled finish on top surface of pads.

END OF SECTION

PART 1 GENERAL

1.01 **SECTION INCLUDES**

A. Pipe markers and accessories

B. Pipe service identification tags

C. Valve service identification tags

D. Valve service identification chart frames

1.02 REFERENCES

A. ANSI A13.1 - Scheme for Identification of Piping Systems.

1.03 SUBMITTALS

A. Product Data: Catalog sheets, specifications and installation instructions for each item specified.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. W.H. Brady Co., Milwaukee, WI.

B. Emed Co., Buffalo, NY.

C. Panduit Corp., Tinley Park, IL.

D. Seton Nameplate Corp., New Haven, CT.

2.02 PIPE MARKERS AND ACCESSORIES

A. Snap-on Marker: One piece wrap around type constructed of precoiled acrylic plastic with clear polyester coating, integral flow arrows, legend printed in alternating directions, 3/4 inch adhesive strip on inside edge, and 360 degree visibility.

B. Strap-On Marker: Strip type constructed of precoiled acrylic plastic with clear polyester coating, integral flow arrows, legend printed in alternating directions, factory applied grommets, and pair of stainless steel spring fasteners.

C. Stick-On Marker: Pressure sensitive adhesive backed type constructed of vinyl with clear polyester coating, and integral flow arrows for applications where flow arrow banding tape is not being used.

D. Pipe Marker Legend and Color Field Sizes:

OUTSIDE DIAMETER OF PIPE OR INSULATION (Inches)	LETTER SIZE (Inches)	LENGTH OF COLOR FIELD (Inches)
3/4 to 1-1/4	1/2	8
1-1/2 to 2	3/4	8
2-1/2 to 6	1-1/4	12

8 to 10	2-1/2	24
Over 10	3-1/2	32

E. Banding Tapes: Pressure sensitive adhesive backed type constructed of vinyl with clear polyester coating.
   1. Plain Tape: Unprinted type; color to match pipe marker background.
   2. Flow Arrow Tape: Printed type with integral flow arrows; color to match pipe marker background.

F. Pipe Size Labels: Pressure sensitive adhesive backed type constructed of vinyl with clear polyester coating, vertical reading pipe size in inches, and legend size matching adjacent pipe marker.

2.03 PIPE SERVICE IDENTIFICATION TAGS

A. Type: No. 19 B & S gage brass, with 1/4 inch high pipe service abbreviated legend on one line, over 1/2 inch high pipe size legend in inches, both deep stamped and black filled; and 3/16 inch top hole for fastener.

B. Size: 2 inch square tag.

C. Fasteners: Brass “S” hook or brass jack chain of size as required for pipe to which tag is attached.

2.04 VALVE SERVICE IDENTIFICATION TAGS

A. Type: No. 19 B & S gage brass, with 1/4 inch high valve service abbreviated lettering on one line over 1/2 inch high valve service chart number, both deep stamped and black filled; and with 3/16 inch top hole for fastener.

B. Sizes:
   1. Plumbing Use: 1-1/2 inch hexagon.

C. Fasteners: Brass “S” hook or brass jack chain of size as required for valve stem or handle to which tag is attached.

2.05 VALVE SERVICE IDENTIFICATION CHART FRAMES

A. Type: Satin finished extruded aluminum frame with rigid clear plastic glazing, size to fit 8-1/2 x 11 inches valve chart.

PART 3 EXECUTION

3.01 PREPARATION

A. Complete testing, insulation and finish painting work prior to completing the Work of this Section.

B. Clean pipe surfaces with cleaning solvents prior to installing piping identification.

C. Remove dust from insulation surfaces with clean cloths prior to installing piping identification.

3.02 INSTALLATION

A. Install the Work of this Section in accordance with the manufacturer's printed installation instructions, unless otherwise specified.

B. Stick-On Pipe Markers:
   1. Install minimum of 2 markers at each specified location, 90 degrees apart on visible side of pipe.
   2. Encircle ends of pipe markers around pipe or insulation with banding tape with one inch lap. Use plain banding tape on markers with integral flow arrows, and flow arrow banding tape on markers without integral flow arrows.

C. Pipe Size Labels: Install labels adjacent to each pipe marker and upstream from flow arrow. Install a minimum of 2 pipe size labels at each specified location, 90 degrees apart on visible side of pipe.

D. Pipe Service Identification Tags: Attach tags to piping being identified with "S" hooks or jack chains.

3.03 PIPING IDENTIFICATION SCHEDULE

A. Piping Identification Types:
   1. Piping or Insulation under 3/4 inch od: Pipe identification tags.
   2. Piping or Insulation 3/4 inch to 5-7/8 inch od: Snap-on marker or stick-on marker.
   3. Piping or Insulation 6 inch od and Larger: Strap-on marker or stick-on marker.

B. Identify exposed piping, bare or insulated, as to content, size of pipe and direction of flow, with the following exceptions:
   1. Piping in non-walk-in tunnels or underground conduits between manholes.
   2. Piping in furred spaces or suspended ceilings, except at valve access panels where valves and piping shall be identified as specified for exposed piping systems.
   3. Piping in finished spaces such as offices, class rooms, wards, toilet rooms, shower rooms and spaces as specified.

C. Locate piping identification to be visible from exposed points of observation.
   1. Locate piping identification at valve locations; at points where piping enters and leaves a partition, wall, floor or ceiling, and at intervals of 20 feet on straight runs.
   2. Where 2 or more pipes run in parallel, place printed legend and other markers in same relative location.

3.04 VALVE IDENTIFICATION SCHEDULE

A. Valve Service Identification Tags:
   1. Tag control valves, except valves at equipment, with a brass tag fastened to the valve handle or stem, marked to indicate service and numbered in sequence for the following applications:
      a. Domestic water valves controlling mains, risers and branch runouts.
      b. Gas valves controlling mains, risers, and branch runouts.
      c. Valves in sprinkler and fire standpipe systems, except hose valves.

B. Valve Service Identification Charts:
   1. Provide 2 framed valve charts for each piping system specified to be provided with valve identification tags. Type charts on 8-1/2 x 11 inches heavy white bond paper, indicating valve number, service and location.

2. Hang framed charts at locations as directed.

END OF SECTION

PART 1 GENERAL

1.01 **SECTION INCLUDES**

A. Cleanout plug

B. Cleanout

C. Cleanout wall plate

D. Cleanout deck plate

E. Air gap fitting

F. Indirect waste funnel

G. Fasteners

1.02 REFERENCES

A. Comply with the applicable requirements of ASME A112.36.2M - Cleanouts, and ASME A112.1.2 - Drainage Funnels and Air Gaps.

1.03 SUBMITTALS

A. Product Data: Catalog sheets, specifications, and installation instructions for each item specified except fasteners.

1.04 MAINTENANCE

A. Special Tools: Deliver the following to the Owner's Representative:
   1. Tools for Vandal Resistant Fasteners: One for each type and size.
   2. T-Handle Wrench for Cleanout Plugs: One for each type and size.

PART 2 PRODUCTS

2.01 CLEANOUT PLUG

A. Cast brass or bronze, with threaded end, and raised or countersunk head.
   1. Tapped head for attachment of cleanout wall or deck plate covers where required.

B. Anti-Seize Lubricant: Never-Seez by Bostik Chemical Group, Broadview, IL; Molycote 1000 by Dow Corning Corp, Midland, MI; Anti-Seize Lubricant by Loctite Corp, Newington, CT.

2.02 CLEANOUT

A. Threaded pipe fitting or cast iron ferrule with gas tight cleanout plug.

2.03 CLEANOUT WALL PLATE

A. Round, stainless steel or polished chrome plated bronze cover plate with stainless steel vandal resistant fastener to secure to cleanout plug.

2.04 CLEANOUT DECK PLATE

A. Standard duty floor cleanout fitting with coated cast iron body; round, polished nickel bronze scoriated top secured to cleanout plug with stainless steel vandal resistant fastener; threaded height adjustment, cast iron head, gas tight cleanout plug, and connection to match piping option selected.

B. Membrane flange and clamping collar, secured with corrosion resistant fasteners.

2.05 AIR GAP FITTING

A. Coated cast iron body with air gaps, set screw or threaded inlet, and outlet connection to match piping option selected.

2.06 INDIRECT WASTE FUNNEL

A. Combination Funnel Drain and P Trap: Polished chrome plated cast brass construction.
   1. Funnel: 4 inch top dia., 4 inches deep, with threaded outlet.
   2. P Trap: Bottom cleanout, threaded inlet, and outlet connection to match piping option selected.

2.07 FASTENERS

A. Corrosion Resistant Fasteners: Brass, bronze, or Type 302 or 304 stainless steel bolts.

B. Vandal Resistant Fasteners: Torx head with center pin.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install the Work of this section in accordance with the manufacturer’s printed installation instructions, unless otherwise specified.

B. Cleanout Plug: Lubricate threads with anti-seize lubricant before final installation.

C. Grease Trap: Set flow control as recommended by the manufacturer’s instructions.

D. Secure external components in place with vandal resistant fasteners or devices which cannot be removed without special tools.

END OF SECTION

PART 1 GENERAL

1.01 **SECTION INCLUDES**

A. Floor drain for installation in concrete flooring

B. Floor sink

C. Area drain

D. Fasteners

1.02 REFERENCES

A. Unless otherwise specified, the Work of this section shall meet the applicable requirements of FS WW-P-541 - Plumbing Fixtures, and ASME A112.21.1M - Floor Drains.

1.03 SUBMITTALS

A. Product Data: Catalog sheets, specifications and installation instructions for each type drain specified.

1.04 MAINTENANCE

A. Special Tools: Deliver to the Building Owner.

B. Tools for Vandal Resistant Fasteners: One for each type and size.

PART 2 PRODUCTS

2.01 FLOOR DRAIN – CONCRETE FLOORING

A. Drain Body: Coated cast iron, two-piece body with reversible flashing clamp, minimum 9 inch dia drainage flange, corrosion resistant bolts, weep holes, bottom outlet, and connection to match piping option selected.

B. Strainer Head: Round, minimum 7 inch dia, nickel bronze with threaded shank for height adjustment.

C. Strainer Grate: Polished nickel bronze, heel proof; secured with stainless steel vandal resistant fasteners.

D. Acceptable Drain Series: Josam 30000A, Smith 2010A, Wade W1100, and Zurn Z415.

2.02 FLOOR SINK

A. Drain Body: 12”x12” coated cast iron, 6” receptor with recessed dome strainer and grating. Interior body to be coated with white acid resistant porcelain enamel.

B. Strainer Dome: ABS anti-splash interior dome strainer

C. Strainer Grate: Light Duty Cast Iron acid resistant coating with ½” slotted opening.
   1. 3/4 grate for (1) pipe discharge
   2. 1/2 grate for (2-3) pipe discharges
   3. No grate for more than 3 pipe discharges
   4. Acceptable Drain Series: Watts FS-710, Sioux Chief 861, Mifab FS1520, and Zurn Z1900.

2.03 AREA DRAIN

A. Drain Body: Dura-coated cast iron, two-piece body with reversible flashing clamp, minimum 15 inch dia drainage flange with 12” grate, corrosion resistant bolts, weep holes, bottom outlet, and connection to match piping option selected.

B. Strainer Head: Square, minimum 12 inch dia, dura-coated, with threaded shank for height adjustment.

C. Strainer Grate: Heavy duty cast iron loose slotted duresist grate, and secured with stainless steel vandal resistant fasteners.

D. Acceptable Drain Series: Watts FD-330, and Zurn Z610.

2.04 FASTENERS

A. Corrosion Resistant Fasteners: Brass, bronze, or Type 302 or 304 or stainless steel bolts.

B. Vandal Resistant Fasteners: Torx head with center pin.

2.05 FREE AREA OF GRATE

A. Minimum strainer grate free area listed below for each connecting pipe size:

CONNECTING PIPE SIZE (Inches Nominal)	**INTERIOR DRAINS FREE AREA (Square Inches)**	**EXTERIOR DRAINS FREE AREA (Square Inches)**
1-1/2	3.06	4.08
2	4.71	6.28
3	10.59	14.12
4	18.90	25.20
5	29.40	39.20
6	42.45	56.60
8	75.38	100.50

PART 3 EXECUTION

3.01 INSTALLATION

A. Install the Work of this section in accordance with the manufacturer’s printed installation instructions, unless otherwise specified.

B. Protect weep holes from plugging during installation. Rod out weep holes after installation to remove obstructions.

C. Set drainage flange flush with top of structural floor slab, or at elevation otherwise indicated.

D. After membrane waterproofing installed and cured, secure clamping ring.

E. Adjust strainer head to height indicated. If height not indicated, set at 1/2 inch below finished floor elevation.

F. Secure external components in place with vandal resistant fasteners or devices which cannot be removed without special tools.

END OF SECTION

PART 1 GENERAL

1.01 **SECTION INCLUDES**

A. Piping insulation

B. Insulation jackets

C. Adhesives, mastics, and sealers

D. Miscellaneous materials

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Through Penetration Firestops: Section 078400.

B. Painting: Section 099103.

C. Pipe Hangers and Supports: Section 220529.

1.03 ABBREVIATIONS

A. FS: Federal Specification.

B. K: Thermal Conductivity, i.e., maximum Btu per inch thickness per hour per square foot.

C. pcf: Pounds per cubic foot.

D. PVC: Polyvinylchloride.

1.04 SUBMITTALS

A. Product Data: Manufacturer's catalog sheets, specifications and installation instructions for the following:
   1. Insulation Materials.
   2. Jacket Materials.

B. Quality Control Submittals:
   1. Installers Qualification Data:
      a. Name of each person who will be performing the Work, and their employer's name, business address and telephone number.
      b. Furnish names and addresses of the required number of similar projects that each person has worked on which meet the qualifications.

1.05 QUALITY ASSURANCE

A. Qualifications: The persons installing the Work of this Section and their Supervisor shall be personally experienced in mechanical insulation work and shall have been regularly employed by a company installing mechanical insulation for a minimum of 5 years.

B. Regulatory Requirements:
   1. Insulation installed inside buildings, including laminated jackets, mastics, sealants and adhesives shall have a Fire Spread/Smoke Developed Rating of 25/50 or less based on ASTM E 84.

PART 2 PRODUCTS

2.01 PIPING INSULATION

A. Fibrous Glass (Mineral Fiber) Insulation: Composed principally of fibers manufactured from rock, slag, or glass, with or without binders, and asbestos free.
   1. Preformed Pipe Insulation: Minimum density 3 pcf; ASTM C 547:
      a. Class 1 (Suitable for Temperatures Up to 450 degrees F): K of 0.26 at 75 degrees F.
   2. Premolded Fitting Insulation: Minimum density 4.0 pcf, K of 0.26 at 75 degrees F; ASTM C 547, Class 1.
   3. Insulation Inserts for PVC Fitting Jackets: Minimum density 1.5 pcf, K of 0.28 at 75 degrees F; ASTM C 553, Type III.
      a. Suitable for temperatures up to 450 degrees F.

B. Flexible Elastomeric Foam Insulation:
   1. FM tested and approved, meeting the following:
      a. Maximum Water Vapor Transmission: 0.10 perm - inch based on ASTM E 96, Procedure A.
      b. K of 0.27 at 75 degrees F based on ASTM C 518 or C 177.
      c. Fire Spread/Smoke Developed Rating: 25/50 or less based on ASTM E 84.
   2. Pipe Insulation: ASTM C 534, Type I.
   3. Polyethylene and polyolefin insulation is not acceptable.

C. High Density Jacketed Insulation Inserts for Hangers and Supports:
   1. For Use with Fibrous Glass Insulation:
      a. Cold Service Piping:
         1) Polyurethane Foam: Minimum density 4 pcf, K of 0.13 at 75 degrees F, minimum compressive strength of 125 psi.
      b. Hot Service Piping:
         1) Calcium Silicate: Minimum density 15 pcf, K of 0.50 at 300 degrees F; ASTM C 533.
         2) Perlite: Minimum density 12 pcf, K of 0.60 at 300 degrees F; ASTM C 610.
   2. For Use with Flexible Elastomeric Foam Insulation: Hardwood dowels and blocks, length or thickness equal to insulation thickness, other dimensions as specified or required.

D. Cements:
   1. Fibrous Glass Thermal Insulating Cement: Asbestos free; ASTM C 195.
   2. Fibrous Glass Hydraulic Setting Thermal Insulating and Finishing Cement: ASTM C 449/C 449M.

2.02 INSULATION JACKETS

A. Laminated Vapor Barrier Jackets for Piping: Factory applied by insulation manufacturer, conforming to ASTM C 1136, Type I.
   1. Type I: Reinforced white kraft and aluminum foil laminate with kraft facing out.
      a. Pipe Jackets: Furnished with integral 1-1/2 inch self sealing longitudinal lap, and separate 3 inch wide adhesive backed butt strips.
   2. Laminated vapor barrier jackets are not required for flexible elastomeric foam insulation.

B. Canvas Jackets: Cotton duck, fire retardant, complying with NFPA 701, 4 oz or 6 oz per sq yd as specified.

C. Premolded PVC Fitting Jackets:
   1. Constructed of high impact, UV resistant PVC.

a. ASTM D 1784, Class 14253-C.
b. Working Temperature: 0-150 degrees F.

D. Under Lavatory Piping Protection Cover: ADA compliant.
1. Construction: 1/8 inch thick chemical, microbial, and fungal resistant, injection molded smooth PVC vinyl with internal ribs.
2. Fasteners: Reusable, finger press internal fasteners presenting no sharp or abrasive external surfaces.
3. Cover Trimming: Tear on internal, dimensioned tear lines for proper fit.
4. Kit includes covering for 8 inch tailpiece-trap, 8 inch waste arm, hot and cold water supplies and valves, and required fasteners.
5. Acceptable Covers:
a. Lav Guard 2, E-Z Series by IPS Corp., 202 Industrial Park Lane, Collierville, TN 38017, (800) 340-5969, www.truebro.com.
b. Pro-Extreme Series by Plumberex, P.O. Box 1684, Palm Springs, CA 92263, (800) 475-8629, www.plumberex.com.

2.03 ADHESIVES, MASTICS, AND SEALERS

A. Lagging Adhesive (Canvas Jackets): Childers' CP-50AMV1, Epolux's Cadalag 336, Foster's 30-36.

B. Vapor Lap Seal Adhesive (Fibrous Glass Insulation): Childers' CP-82, Epolux's Cadoprene 400, Foster's 85-60 or 85-20.

C. Vapor Barrier Mastic(Fibrous Glass Insulation): Permeance shall be .03 perms or less at 45 mils dry per ASTM E 96. Childers' CP-34, Epolux's Cadalar 670, Foster's 30-65.

D. Adhesive (Flexible Elastomeric Foam): Armstrong's 520, Childers' CP-82, Epolux's Cadoprene 488, Foster's 85-75. 5 gallon cans only

E. Adhesive (Fiberglass Duct Liner): Childers' Chil Quick CP-127, Foster Vapor Fas 85-60. Must comply with ASTM C 916, Type II

F. Weather Barrier Breather Mastic (Reinforcing Membrane): Childers' VI-CRYL CP-10/11, Foster's Weatherite 46-50.

G. Sealant (Metal Pipe Jacket): Non hardening elastomeric sealants. Foster Elastolar 95-44, Childers Chil Byl CP-76, Pittsburgh Corning 727

H. Reinforcing Membrane: Childers' Chil Glas #10, Foster Mast a Fab, Pittsburgh Corning PC 79

2.04 MISCELLANEOUS MATERIALS

A. Pressure Sensitive Tape for Sealing Laminated Jackets:
1. Acceptable Manufacturers: Alpha Associates, Ideal Tape, Morgan Adhesive.
2. Type: Same construction as jacket.

B. Wire, Bands, and Wire Mesh:
1. Binding and Lacing Wire: Nickel copper alloy or copper clad steel, gage as specified.
2. Bands: Galvanized steel, 1/2 inch wide x 0.015 inch thick, with 0.032 inch thick galvanized wing seals.
3. Wire Mesh: Woven 20 gage steel wire with 1 inch hexagonal openings, galvanized after weaving.

C. Reinforcing Membrane: Glass or Polyester, 10 x 10 mesh. Alpha Associates Style 59, Childer's Chil-Glas, Foster's MAST-A-FAB.

PART 3 EXECUTION

3.01 PREPARATION

A. Perform the following before starting insulation Work:
   1. Install hangers, supports and appurtenances in their permanent locations.
   2. Complete testing of piping.
   3. Clean and dry surfaces to be insulated.

3.02 INSTALLATION, GENERAL

A. Install the Work of this Section in accordance with the manufacturer's printed installation instructions unless otherwise specified.

B. Provide continuous piping insulation and jacketing when passing thru interior wall, floor, and ceiling construction.
   1. At Through Penetration Firestops: Coordinate insulation densities with the requirements of approved firestop system being installed. See Section 078400.
      a. Insulation densities required by approved firestop system may vary with the densities specified in this Section. When this occurs use the higher density insulation.

C. Do not intermix different insulation materials on individual runs of piping.

D. All water, soil, and waste piping exposed to freezing temperatures shall be protected from freezing by insulation, heat, or both. This included piping in unheated garages, building overhangs, and exposed storm piping.

3.03 INSTALLATION AT HANGERS AND SUPPORTS

A. Reset and realign hangers and supports if they are displaced while installing insulation.

B. Install high density jacketed insulation inserts at hangers and supports for insulated piping.

C. Insulation Inserts For Use with Fibrous Glass Insulation:
   1. Where clevis hangers are used, install insulation shields and high density jacketed insulation inserts between shield and pipe.
      a. Where insulation is subject to compression at points over 180 degrees apart, e.g. riser clamps, U-bolts, trapezes, etc.; fully encircle pipe with 2 protection shields and 2 high density jacketed fibrous glass insulation inserts within supporting members.
         1) Exception: Locations where pipe covering protection saddles are specified for hot service piping, 6 inch and larger.

D. Insulation Inserts For Use with Flexible Elastomeric Foam Insulation:
   1. Where clevis hangers are used, install insulation shields with hardwood filler pieces, same thickness as adjoining insulation, inserted in undersized die cut or slotted holes in insulation at support points.
   2. Contour hardwood blocks to match the curvature of pipe, and shield.
   3. Coat dowels and blocks with insulation adhesive, and insert while still wet.
   4. Vapor seal outer surfaces of dowels and blocks with adhesive after insertion.
   5. Install filler pieces as follows:

PIPE/TUBING SIZE	FILLER PIECES	POSITION

Thru 1-1/2”	2 dowel plugs	6 o’clock; in tandem
2” thru 4”	1 block, 2 dowel plugs	6 o’clock, and 4 & 8 o’clock respectively
6” thru 8”	2 blocks, 4 dowel plugs	6 o’clock; in tandem and 4 & 8 o’clock; in tandem

3.04 INSTALLATION OF FIBROUS GLASS COLD SERVICE INSULATION

A. Install insulation materials with a field or factory applied ASTM C 1136 Type I laminated vapor barrier jacket, unless otherwise specified.

B. Piping:
   1. Butt insulation joints together, continuously seal minimum 1-1/2 inch wide self-sealing longitudinal jacket laps and 3-inch wide butt adhesive backed strips.
      a. Substitution: 3 inch wide pressure sensitive sealing tape, of same material as jacket, may be used in lieu of butt strips.
   2. Bed insulation in a 2-inch wide band of vapor barrier mastic, and vapor seal exposed ends of insulation with vapor barrier mastic at each butt joint between pipe insulation and equipment, fittings or flanges at the following intervals:
      a. Horizontal Pipe Runs: 21 ft.
      b. Vertical Pipe Runs: 9 ft.

C. Fittings, Valves, Flanges and Irregular Surfaces:
   1. Insulate with mitre cut or premolded fitting insulation of same material and thickness as pipe insulation.
   2. Secure insulation in place with 16-gage wire, with ends twisted and turned down into insulation.
   3. Butt insulation against pipe insulation and bond with joint sealer.
   4. Insulate valves up to and including bonnets, without interfering with packing nuts.
   5. Apply leveling coat of insulating cement to smooth out insulation and cover wiring.
   6. When insulating cement has dried, seal fitting, valve and flange insulation, by imbedding a layer of reinforcing membrane or 4 oz. canvas jacket between 2 flood coats of vapor barrier mastic, each 1/8 inch thick wet.
   7. Lap reinforcing membrane or canvas on itself and adjoining pipe insulation at least 2 inches.
   8. Trowel, brush or rubber glove outside coat over entire insulated surface.
   9. Exceptions:
      a. Type C and D Piping Systems: Valves, fittings and flanges may be insulated with premolded PVC fitting jackets, with fibrous glass insulation inserts.
         1) Additional insulation inserts are required for services with operating temperatures under 45 degrees F or where insulation thickness exceeds 1-1/2 inches. The surface temperature of PVC fitting jacket must not go below 45 degrees F.

3.05 INSTALLATION OF FIBROUS GLASS HOT SERVICE INSULATION

A. Install insulation materials with field or factory applied ASTM C 1136 Type I laminated vapor barrier jacket unless otherwise specified.

B. Canvas Jackets on Piping, Fittings, Valves, Flanges, Unions, and Irregular Surfaces:
   1. For Piping 2 inch Size and Smaller: 4 oz per sq yd unless otherwise specified.
   2. For Piping Over 2 inch Size: 6 oz per sq yd unless otherwise specified.

C. Piping:
   1. Butt insulation joints together, continuously seal minimum 1-1/2 inch wide self-sealing longitudinal jacket laps and 3-inch wide adhesive backed butt strips.
      a. Substitution: 3 inch wide pressure sensitive sealing tape, of same material as the jacket, may be used in lieu of butt strips.
   2. Fill voids in insulation at hanger with insulating cement.
   3. Exceptions:
      a. Piping in Accessible Shafts, Attic Spaces, Crawl Spaces, Unfinished Spaces and Concealed Piping: Butt insulation joints together and secure minimum 1-1/2 inch wide longitudinal jacket laps and 3 inch wide butt strips of same material as jacket, with outward clinching staples on maximum 4 inch centers. Fill voids in insulation at hangers with insulating cement.

D. Fittings, Valves, Flanges and Irregular Surfaces:
   1. Insulate with mitre cut or premolded fitting insulation of same material and thickness as insulation.
   2. Secure in place with 16-gage wire, with ends twisted and turned down into insulation.
   3. Butt fitting, valve and flange insulation against pipe insulation, and fill voids with insulating cement.
   4. Insulate valves up to and including bonnets, without interfering with packing nuts.
   5. Apply leveling coat of insulating cement to smooth out insulation and cover wiring.
   6. After insulating cement has dried, coat insulated surface with lagging adhesive, and apply 4 oz or 6 oz canvas jacket as required by pipe size.
      a. Lap canvas jacket on itself and adjoining pipe insulation at least 2 inches.
      b. Size entire canvas jacket with lagging adhesive.
   7. Exceptions:
      a. In Types E, and F Service Piping Systems: Valves, fittings and flanges may be insulated with premolded PVC fitting jackets, with fibrous glass insulation inserts.
         1) Additional insulation inserts are required for services with operating temperatures over 250 degrees F or where insulation thickness exceeds 1-1/2 inches. The surface temperature of PVC fitting jacket must not exceed 150 degrees F.
      b. In Types E, and F Service Piping Systems: Insulate fittings, valves, and irregular surfaces 3 inch size and smaller with insulating cement covered with 4 oz or 6 oz canvas jacket as required by pipe size.
         1) Terminate pipe insulation adjacent to flanges and unions with insulating cement, trowelled down to pipe on a bevel.
      c. Fittings, Valves, Flanges, and Irregular Surfaces In Concealed Piping, Piping in Accessible Shafts, Attic Spaces, Crawl Spaces, Unfinished Rooms, Unfinished Spaces, and Tunnels: Sizing of canvas surface is not required.

3.06 INSTALLATION OF FLEXIBLE ELASTOMERIC FOAM INSULATION

A. Where possible, slip insulation over the pipe, and seal butt joints with adhesive.
   1. Where the slip-on technique is not possible, slit the insulation and install.
   2. Re-seal with adhesive, making sure the mating surfaces are completely joined.

B. Insulate fittings and valves with miter cut sections. Use templates provided by the manufacturer, and assemble the cut sections in accordance with the manufacturer's printed instructions.
   1. Insulate threaded fittings and valves with sleeved fitting covers. Over lap and seal the covers to the adjoining pipe insulation with adhesive.

C. Carefully mate and seal with adhesive all contact surfaces to maintain the integrity of the vapor barrier of the system.

D. Piping Exposed Exterior to a Building, Totally Exposed to the Elements:
   1. Apply flexible elastomeric foam insulation to piping with adhesive.
   2. Apply reinforcing membrane around piping insulation with adhesive or mastic.
   3. Adhesive Applied System: Apply 2 coats of finish. See Section 099103.
   4. Mastic Applied System: Apply another coat of mastic over reinforcing membrane.

3.07 INSTALLATION OF SHEET METAL JACKETING ON PIPING

A. Secure jacketing to insulated piping with preformed aluminum snap straps and stainless steel strapping installed with special banding wrench.

B. Jacket exposed insulated fittings, valves and flanges with mitred sections of aluminum jacketing.
   1. Seal joints with sealant and secure with preformed aluminum bands.

3.08 FIELD QUALITY CONTROL

A. Field Samples: The Owner's Representative, may at their discretion, take field samples of installed insulation for the purpose of checking materials and application. Reinsulate sample cut areas.

3.09 PIPING INSULATION SCHEDULE

A. Insulate all cold service and hot service piping, and appurtenances except where otherwise specified.

B. Schedule of Items Not to be Insulated:
   1. Chrome plated piping, unless otherwise specified.
   2. Exposed piping in finished spaces, serving one fixture, or piece of equipment, and which connection from the main, branch, or riser, is 24 inches or less in length.
   3. Water heater blow-off piping.
   4. Air vents, pressure reducing valves, pilot lines, safety valves, relief valves.
   5. Water meters.
   6. Piping buried in the ground, unless otherwise specified herein.
   7. Items installed by others, unless otherwise specified herein.
   8. Sanitary drainage piping, unless otherwise specified herein.
   9. Mechanical equipment with factory applied steel jacket.
   10. Hot service piping 81 degrees F to 104 degrees F.
   11. Flanges and unions in Type E, F, and G service piping systems.
   12. Sprinkler and standpipe piping, unless otherwise specified.

3.10 COLD SERVICE INSULATION MATERIAL SCHEDULE

TYPE	SERVICE AND TEMPERATURES	INSULATION MATERIAL	PIPE SIZES (INCHES)	MINIMUM (NOMINAL) INSULATION THICKNESS (INCHES)

C	Fluids (except domestic cold water) 40 F to 80 F.	Flex. Elastomeric Foam or Fibrous Glass	1-1/2 & less Over 1-1/2	1 1-1/2
D	Domestic cold water, and as specified. 33 F to 80 F.	Flex. Elastomeric Foam or Fibrous Glass	All Sizes	1/2

A. NOTES:
   1. Sprinkler and Standpipe Piping (First 10 feet connected to domestic water main within building): Insulate with same materials and thicknesses specified for domestic cold water.
   2. Roof Drain Bodies Below Roof, Horizontal Conductor Piping Including Drops, and First Fitting on Vertical conductor: Insulate with same materials and thicknesses specified for domestic cold water.
   3. Piping Serving Handicapped Accessible Lavatories:
      a. Insulate exposed hot and cold water supply, and waste piping with under lav piping protection cover. Install fasteners thru each pair of holes in insulated safety wrap.

3.11 HOT SERVICE INSULATION MATERIAL SCHEDULE

	SERVICE AND TEMPERATURES	**INSULATION MATERIAL**	**PIPE SIZES (INCHES)**	**MINIMUM (NOMINAL) INSULATION THICKNESS (INCHES)**
E	Water and other fluids 105 F to140 F.	Flex. Elastomeric Foam or Fibrous Glass	1-1/2 & Less Over 1-1/2	1 2
F	Water and other fluids 141 F to 250 F.	Fibrous Glass	6 & Less 8 & Up	2 2-1/2

3.12 SCHEDULE OF METAL JACKETING FOR INSULATED PIPE

A. Piping Exterior to Building: Jacket insulated piping with circumferentially corrugated aluminum jacketing.
   1. Lap longitudinal and circumferential joints a minimum of 2 inches.
   2. Secure jacketing in place with 1/2 inch x 0.020 inch thick aluminum bands secured with aluminum wing type seals, on maximum 12 inch centers.
   3. Cover insulated fittings, valves, and offsets with mitered sections of jacketing. Seal joints with metal pipe jacket sealant, and secure with aluminum strapping and wing seals.
   4. Factory fabricated, preformed fitting covers of same material as jacketing may be used instead of mitered jacketing.
   5. Install jacketing so as to avoid trapping condensation and precipitation.

END OF SECTION

PART 1 GENERAL

1.01 **SECTION INCLUDES**

A. Domestic water piping and fittings

B. Compressed air piping and fittings

C. Natural gas piping and fittings

D. Sanitary and storm piping and fittings

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Through Penetration Firestops: Section 078400.

B. Sealants: Section 079200.

1.03 SUBMITTALS

A. Product Data:
   1. Catalog sheets and specifications indicating manufacturer name, type, applicable reference standard, schedule, or class for specified pipe and fittings.
   2. Material Schedule: Itemize pipe and fitting materials for each specified application in Pipe and Fittings Schedule in Part 3 of this Section. Where optional materials are specified indicate option selected.

B. Quality Control Submittals
   1. Copy of hydraulic press fitting manufacturer's printed field inspection procedures for hydraulic press joints in domestic tubing.

PART 2 PRODUCTS

2.01 STEEL PIPE AND FITTINGS

A. Steel Pipe for Threading: Standard weight, Schedule 40, black or galvanized; ASTM A 53 or ASTM A 135.

B. Malleable Iron, Steam Pattern Threaded Fittings:
   1. 150 lb Class: ASME B16.3.
   2. 300 lb Class: ASME B16.3.

C. Cast Iron Fittings:
   1. Drainage Pattern, Threaded: ASME B16.12.
   2. Steam Pattern, Threaded: ASME B16.4.
      a. Standard Weight: Class 125.
      b. Extra Heavy Weight: Class 250.

D. Unions: Malleable iron, 250 lb class, brass to iron or brass to brass seats.

E. Couplings: Same material and pressure rating as adjoining pipe, conforming to standards for fittings in such pipe. Use taper tapped threaded type in screwed pipe systems operating in excess of 15 psig.

F. Nipples: Same material and strength as adjoining pipe, except nipples having a length of less than one inch between threads shall be extra heavy.

2.02 COPPER AND BRASS PIPE, TUBING AND FITTINGS

A. Copper Tube, Types K, L, and M: ASTM B 88.

B. Wrot Copper Tube Fittings, Solder Joint: ASME B16.22.

C. Cast Copper Alloy Tube Fittings, Solder Joint: ASME B16.18.

D. Drainage Tube, Type DWV: ASTM B 306.

E. Wrot Copper Drainage Tube Fittings, Solder Joint: ASME B16.29.

F. Cast Copper Alloy Drainage Fittings, Solder Joint: ASME B16.23.

G. Unions: Cast bronze, 150 lb Class, bronze to bronze seats, threaded or solder joint.

H. Plumber's Tube: Seamless, semi-annealed, minimum 65 percent copper, No. 18 B & S Gage.

I. Flared Tube Fittings:
   1. Water Tube Type: ASME B16.26.
   2. Refrigerant Tube Type: SAE J513.

J. Flanges: Conform to the Standards for fittings used in systems.
   1. Brazing Flanges: ASME B16.24, hubs modified for brazing ends.

2.03 HYDRAULIC PRESS FITTINGS FOR COPPER TUBING

A. Acceptable Fittings:
   1. ProPress by Viega, 301 N. Main, Wichita, KS 67202, (877) 843-4262, www.viega.com.
   2. Operating Conditions:
      a. Maximum Operating Pressure: 200 psi.
      b. Operating Temperature Range: 0-250 degrees F.
      c. Maximum Test Pressure: 600 psi.
      d. Maximum Vacuum: 29.2 inches hg @ 68 degrees F.
   3. Features:
      a. Fittings: Copper and copper alloy conforming to material requirements of ASME B16.18 or ASME B16.22.
         1) Stainless Steel Grip Ring: Adds strength to the joint without collapsing the interior passageway
      b. No flame for soldering required for installation of fittings and valves.
      c. Unpressed connections identified during pressure testing when water flows past sealing element.
      d. Sealing Elements: Factory installed, EPDM.
      e. Fittings that have been pressed can be rotated. If rotated more than 5 degrees, the fitting must be repressed to restore its resistance to rotational movement.
      f. Extended fitting end lead allows for twice the retention grip surface, and assists with proper tube alignment.
      g. Soldered adapter fittings are not allowed.

2.04 CAST IRON PIPE AND FITTINGS

A. Bell and Spigot Soil Pipe: Service Weight, Bitumin coated; ASTM A 74.

B. Bell and Spigot Soil Pipe Fittings: Service Weight, Bitumin coated; ASTM A 74.

C. Hubless Pipe: Bitumin coated; Cast Iron Soil Pipe Institute Standard No. 301.

D. Hubless Pipe Fittings: Drainage Pattern, Bitumin coated; Cast Iron Soil Pipe Institute Standard No. 301.

E. Hubless Joint Couplings: Stainless steel shield and clamp assembly, and elastomer sealing sleeve; CISPI-310.

F. Water Pipe Fittings: Bitumin coated, cement-mortar lined; AWWA C110.

2.05 DUCTILE IRON PIPE AND FITTINGS

A. Water Pipe: Bitumin coated and cement-mortar lined; AWWA C151.
   1. 3 and 4 Inch Sizes: Class 51.
   2. 6 inch Size and Over: Class 50.

B. Fittings: Bitumin coated and cement-mortar lined; AWWA C110.

2.06 COUPLINGS AND FITTINGS FOR GROOVED END PIPE

A. Couplings: Grinnell Corp.'s Rigidlok Fig. 7401, or Victaulic Co.'s Style 107, having minimum pressure rating of:
   1. 750 psi from 1-1/2 inch to 4 inch.
   2. 700 psi for 6 inch.
   3. 600 psi for 8 inch.
   4. Couplings: Gustin-Bacon Inc.'s No. 100 Gruvagrips, or Victaulic Co.'s Style 77, having pressure rating of:
      a. 1000 psi for 3/4 inch to 6 inch.
      b. 800 psi for 8 inch to 12 inch.
      c. 300 psi for 14 inch to 24 inch.
   5. Fittings: By same manufacturer as couplings, having pressure ratings equal to or greater than couplings. Comply with the following standards:
      a. Steel: ASTM A 53 or A 106, Grade B.
      b. Malleable Iron: ASTM A 47.
      c. Ductile Iron: ASTM A 536.

2.07 JOINING AND SEALANT MATERIALS

A. Thread Sealant:
   1. LA-CO Industries', Slic-Tite Paste with Teflon.
   2. Loctite Corp.'s No. 565 Thread Sealant.
   3. Thread sealants for potable water shall be NSF approved.

B. Thread Sealant (Natural Gas Piping): Rectorseal Corp.'s T Plus 2 non-hardening pipe dope with teflon.

C. Solder: Solid wire type conforming to the following:
   1. Type 3: Lead-free tin-silver solder (ASTM B 32 Alloy Grade E, AC, or HB); Engelhard Corp.'s Silvabrite 100, Federated Fry Metals' Aqua Clean, or J.W. Harris Co. Inc.'s Stay-Safe Bridgit.

D. Soldering Flux for Soldered Joints: All-State Welding Products Inc.'s Duzall, Engelhard Corp.'s General Purpose Liquid or Paste, Federated Fry Metals' Water Flow 2000, or J.W. Harris Co. Inc.'s Stay-Clean.

E. Lead for Calking Joints in Cast Iron Soil Pipe: ASTM B 29 for pig lead.

F. Joint Packing:
   1. Oiled Oakum: Manufactured by Nupak of New Orleans, Inc., 931 Daniel St., Kenner, LA 70062, (504) 466-1484.
   2. Acid Resistant Joint Packing: Sealite Inc.'s Red Stripe, Asbestos-Free Acid-Resistant White Oakum, No. 312.

G. Gaskets For Use With Ductile Iron Water Pipe and Cast Iron Drainage Pipe: Synthetic rubber rings (molded or tubular): Clow Corp.'s Belltite, Tyler Pipe Industries Inc.'s Ty-Seal, or U.S. Pipe and Foundry Co.'s Tyton.

H. Flange Gasket Material:
   1. For Use with Cold Water: 1/16 inch thick rubber.
   2. For Use with Hot Water, or Air : Waterproofed non-asbestos ceramic or mineral fiber, or a combination of metal and water-proofed non-asbestos ceramic or mineral fiber, designed for the temperatures and pressures of the piping systems in which installed.

I. Gaskets For Use With Grooved End Pipes and Fittings: Type and materials as recommended and furnished by the fitting manufacturer, for the service of piping system in which installed.

J. Anti-Seize Lubricant: Bostik Inc.'s Never Seez or Dow Corning Corp.'s Molykote 1000.

2.08 PACKING MATERIALS FOR BUILDING CONSTRUCTION PENETRATIONS

A. Oiled Oakum: Manufactured by Nupak of New Orleans, Inc., 931 Daniel St., Kenner, LA 70062, (504)466-1484.

2.09 DIELECTRIC CONNECTORS

A. Dielectric Fitting: Bronze ball valve with end connections and pressure rating to match associated piping.
   1. Nipples with inert non-corrosive thermoplastic linings are not acceptable.
   2. Flange Electrical Insulation Kit: Consisting of dielectric sleeves and washers, and dielectric gasket.
      a. Rated 150 psi at 250 degrees F: ANSI Class 150, full faced neoprene gasket with bolt holes, double phenolic washers, and mylar sleeves; Model 150 by APS, Lafayette, LA 70596, (337) 233-6116.

2.10 PIPE SLEEVES

A. Type A: Schedule 40 steel pipe.

B. Type B: No. 16 gage galvanized sheet steel.

C. Type C: Schedule 40 steel pipe with 1/4 inch steel collar continuously welded to pipe sleeve. Size steel collars as required to span a minimum of one cell or corrugation, on all sides of the rough opening thru the metal deck.

D. Type D: No. 16 gage galvanized sheet steel with 16 gage sheet steel metal collar rigidly secured to sleeve. Size metal collars as required to span a minimum of one cell or corrugation, on all sides of the rough opening thru the metal deck.

2.11 FLOOR, WALL AND CEILING PLATES

A. Cast Brass: Solid type with polished chrome plated finish, and set screw.
   1. Series Z89 by Zurn, 929 Riverside Drive, Grosvenordale, CT 06255, (800) 243-1830.
   2. Model 127XXXX by Maguire Mfg., Cheshire CT 06410, (203) 699-1801.
   3. Stamped Steel: Split type, polished chrome plated finish, with set screw.
      a. Figures 2 and 13 by Anvil International, Portsmouth, NH 03802, (603) 422-8000.
   4. Cast Iron or Malleable Iron: Solid type, galvanized finish, with set screw:
      a. Model 395 by Anvil International, Portsmouth, NH 03802, (603) 422-8000.
      b. Model 900-016XX by Landsdale International, Westville, NJ 08093, (800) 908-0523.

2.12 FLEXIBLE CONNECTIONS

A. Underground Application:
   1. Acceptable Companies:
      a. Titeflex Inc., Springfield, MA.
      b. Flex-ing, Sherman, TX.
   2. Features:
      a. Construction: Stainless steel innercore covered with braided Type 304 stainless steel outer jacket.
      b. UL listed for underground fuel storage tank systems.
      c. Permanently crimped stainless steel collars with one threaded end and one threaded swivel end.

B. Underground or Above Ground Application:
   1. Acceptable Companies:
      a. Titeflex Inc., Springfield, MA.
      b. Flex-ing, Sherman, TX.
   2. Features:
      a. Construction: Convoluted, Type 321 stainless steel inner core, minimum .012 inch wall thickness covered with braided Type 304 stainless steel outer jacket.
      b. UL listed for above ground and underground use.
      c. Factory installed male swivel on one end.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install piping at approximate locations indicated, and at maximum height.

B. Install piping clear of door swings, and above sash heads.

C. Make allowances for expansion and contraction.

D. Allow for a minimum of one inch free air space around pipe or pipe covering, unless otherwise specified.

E. Install horizontal piping with a constant pitch, and without sags or humps.
   1. Water Piping: Pitch 1/4 inch per 10 feet upward in direction of flow, unless otherwise noted. If it is not possible to maintain constant pitch, establish a new low point and continue. At the low point, provide a 1/2 inch drip leg and gate valve with a hose bibb end. Provide an air vent at the high point.
   2. Drainage Piping: Pitch 1/4 inch per foot downward, in direction of flow, unless otherwise noted.

3. Vent Piping: Pitch 1/4 inch per foot upward, unless otherwise noted.

F. Install vertical piping plumb.

G. Use fittings for offsets and direction changes, except for Type K soft annealed copper temper water tube.

H. Cut pipe and tubing ends square; ream before joining.

I. Threading: Use American Standard Taper Pipe Thread Dies.
1. Thread brass pipe with special brass threading dies.

3.02 DRAINAGE SYSTEMS

A. Fittings:
1. Use long turn drainage pattern fittings, unless space conditions prohibit their use; in such cases, short turn pattern fittings may be used.
2. Vertical Offsets: Make vertical offsets with 45 degree elbows, or 1/8 bends.
3. Tucker Fittings: Tucker fittings may only be installed in vertical piping.

B. Cleanouts:
1. Install cleanouts with sufficient side and end clearance to allow for the removal of the cleanout plug, and the use of cleaning tools.
2. Lubricate cleanout plugs with anti-seize lubricant.

3.03 DOMESTIC WATER PIPING SYSTEM

A. Connect runouts to the upper quadrant of the main, and run upward at not less than 45 degrees before extending laterally.

B. Make final connections to plumbing fixtures and equipment with unions, or flanges:
1. Do not use unions in ferrous piping larger than 3 inches.
2. Do not use unions in brass or copper piping larger than 2 inches.

3.04 NATURAL GAS PIPING SYSTEM

A. Install gas piping system in conformance with the National Fuel Gas Code, NFPA 54, or as required by the serving gas supplier.

B. Use non-hardening pipe dope on threads. Do not use thread seal tape.

3.05 PIPE JOINT MAKE-UP

A. Threaded Joint: Make up joint with a pipe thread compound applied in accordance with manufacturer’s printed application instructions for the intended service.
1. Chrome Plated Brass Pipe: Tighten joint with a strap or Parmalee wrench; do not mar pipe finish. Install piping so that no threads are visible.

B. Soldered Joint: Thoroughly clean tube end and inside of fitting with emery cloth, sand cloth, or wire brush. Apply flux to the pre-cleaned surfaces. Install fitting, heat to soldering temperature, and join the metals with type solder specified. Remove residue.

C. Flanged Pipe Joint:
1. Install threaded companion flanges on steel pipe; flanges on galvanized pipe are not required to be galvanized.
2. Provide a gasket for each joint.

a. Hot Water Pipe Gasket: Coat with a thin film of oil before making up joint.
b. Air Pipe Gasket: Coat with a thin film of oil before making up joint.

3. Coat bolt threads and nuts with anti-seize lubricant before making up joint.

D. Calked Joint: Pack hub with joint packing specified, and calk. Run 12 ounces molten lead for each inch of pipe diameter. Calk cooled lead ring and face off smoothly.

E. Rubber Ring Push-on Joint: Clean hub, bevel spigot, and make up joint with lubricated gasket in conformance with the manufacturer's printed installation instructions.

F. Grooved Pipe Joint: Roll groove pipe ends, make up joint with grooved end fittings and couplings, in conformance with the manufacturer's printed installation instructions.
1. Cut grooved end piping is not acceptable.

G. Hubless CI Pipe Joint: Make up joint with hubless fitting and couplings, in conformance with the manufacturer's printed installation instructions.

H. Mechanical Joint: Make up joint in conformance with the manufacturer's printed installation instructions, with particular reference to tightening of bolts.

I. Polyethylene Containment Pipe Joint: Follow manufacturer's printed installation instructions.

J. High Density Polyethylene Pipe Joint (HDPE): Follow manufacturer's printed installation instructions.

K. Hydraulic Pressed Joint: Follow manufacturer's printed installation instructions.

L. Dissimilar Pipe Joint:
1. Joining Bell and Spigot and Threaded Pipe: Install a half coupling on the pipe or tube end to form a spigot, and calk into the cast iron bell.
2. Joining Dissimilar Threaded Piping: Make up connection with a threaded coupling or with companion flanges.
3. Joining Dissimilar Non-Threaded Piping: Make up connection with adapters recommended by the manufacturers of the piping to be joined.
4. Joining Galvanized Steel Pipe and Copper Tubing: Make up connection with a dielectric connector.
5. Joining FRP and Threaded Pipe: Make up connection with adapters as recommended by manufacturers of piping being joined.

3.06 PIPING PENETRATIONS

A. Sleeve Schedule: Unless otherwise shown, comply with the following schedule for the type of sleeve to be used where piping penetrates wall or floor construction:

1. CONSTRUCTION	SLEEVE TYPE
a. Frame construction.	None Required
b. Foundation walls.	A*
c. Non-waterproof interior walls.	B*
d. Non-waterproof interior floors on metal decks.	D*
e. Non-waterproof interior floors not on metal decks.	B*
f. Floors not on grade having a floor drain.	A
g. Floors over mechanical equipment, steam service, machine, and boiler rooms.	A

h.	Floors finished or to be finished with latex composition or terrazzo, and on metal decks.	D*
i.	Floors finished or to be finished with latex composition or terrazzo, and not on metal decks.	A
j.	Earth supported concrete floors.	None Required
k.	Exterior concrete slabs on grade.	A
l.	Fixtures with floor outlet waste piping.	None Required
m.	Metal roof decks.	C
n.	Non-metal roof decks.	A
o.	Waterproof floors on metal decks.	D
p.	Waterproof floors not on metal decks.	A
q.	Waterproof walls.	A

*Core drilling is permissible in lieu of sleeves where marked with asterisks.

B. Diameter of Sleeves and Core Drilled Holes:
   1. Unless otherwise specified, size holes thru floors and walls in accordance with the through penetration fire stopping system being used.
   2. Size holes thru exterior walls or waterproofed walls above inside earth or finished floors, and exterior concrete slabs in accordance with the following:
      a. Uninsulated (Bare) Pipe: Inside diameter of sleeve or core drilled hole 1/2 inch greater than outside diameter of pipe, unless otherwise specified.
      b. Insulated Pipe: Inside diameter of sleeve or core drilled hole 1/2 inch greater than outside diameter of insulation, unless otherwise specified.
      c. Mechanical Modular Seals: Size holes in accordance with the manufacturer's recommendations.
   3. Size holes for sprinkler and fire standpipe piping in accordance with NFPA 13.

C. Length of Sleeves (except as shown otherwise on Drawings):
   1. Walls and Partitions: Equal in length to total finished thickness of wall or partition.
   2. Floors with Finish: Equal in length to total finished thickness of floor and extending 1/2 inch above the finished floor level, except as follows:
      a. In furred spaces at exterior walls, extend sleeve one inch above the finished floor level.
   3. Exterior Concrete Slabs: Equal in length to total thickness of slab and extending 1/2 inch above the concrete slab.
   4. Roofs: Equal in length to the total thickness of roof construction, including insulation and roofing materials, and extending one inch above the finished roof level.

D. Packing of Sleeves and Core Drilled Holes:
   1. Unless otherwise specified, pack sleeves or cored drilled holes in accordance with Section 078400 - FIRESTOPPING.
   2. Pack sleeves in exterior walls or waterproofed walls above inside earth or finished floors with oakum to within 1/2 inch of each wall face, and finish both sides with Type 1C (one part) sealant. See Section 079200.
      a. Mechanical modular seals may be used in lieu of packing and sealant for sleeves and core drilled holes.
   3. Pack sleeves in exterior concrete slabs with oakum to full depth, and within 1/2 inch of top of sleeve and finish the remainder with sealant. See Section 079200.
      a. Sealant Types:
         1) Piping Conveying Materials up to 140 degrees F other than Motor Fuel Dispensing System Piping: Type 1C (one part).

b. Mechanical modular seals may be used in lieu of packing and sealant for sleeves and core drilled holes.

E. Weld metal collars of Type C and D sleeves to the upper surface of the metal deck. Seal voids under the metal collar as recommended by the manufacturer of the metal deck.

3.07 FLOOR, WALL AND CEILING PLATES

A. Install plates for exposed uninsulated piping passing thru floors, walls, ceilings, and exterior concrete slabs as follows:
   1. In Finished Spaces:
      a. Piping 4 Inch Size and Smaller: Solid or split, chrome plated cast brass.
      b. Piping Over 4 Inch Size: Split, chrome plated cast brass.
      c. Unfinished Spaces (Including Exterior Concrete Slabs): Solid, unplated cast iron.
      d. Fasten plates with set screws.
      e. Plates are not required in pipe shafts or furred spaces.

3.08 PIPE AND FITTING SCHEDULE

A. Where options are given, choose only one option for each piping service. No deviations from the selected option will be allowed.

B. Compressed Air (Above Ground) Pressures up to 175 psig:
   1. Type L hard drawn copper tube, with cast copper alloy or wrot copper solder type fittings, and joints made up with Type 3 solder.
   2. Standard weight black steel pipe with 150 lb malleable iron fittings, and threaded joints.

C. Compressed Air (Above Ground) Pressures 176 psi thru 300 psi:
   1. Standard weight black steel pipe, with 300 lb malleable iron fittings, and threaded joints.

D. Compressed Air (Below Ground) Pressures up to 175 psig:
   1. Type K soft annealed copper tube with refrigerant tube type flared fittings.
   2. Standard weight galvanized steel pipe, with threaded ends, and 150 psi galvanized malleable iron fittings, and threaded joints.

E. Compressed Air (Below Ground) Pressures 176 psi thru 300 psi:
   1. Standard weight galvanized steel pipe, with and 300 psi galvanized malleable iron fittings, and threaded joints.

F. Domestic Water (Above Ground):
   1. 3 inch and Under: Type L hard drawn copper tube, with cast copper alloy or wrot copper solder type fittings, and joints made up with Type 3 solder, or hydraulic press joints.
   2. 4 inch and Over: Coated ductile iron water pipe and fittings, with mechanical or push-on joints installed as per manufacturer’s instructions.

G. Domestic Water (Below Ground):
   1. 2-1/2 inches and Under: Type K soft annealed copper tube with water tube type flared fittings.
   2. 3 inches and Over: Coated ductile iron water pipe and fittings, with mechanical or push-on joints.

H. Drainage (Sanitary) Above Ground:
   1. Service weight, coated, cast iron bell and spigot pipe and fittings with calked joints.
   2. Service weight, coated, cast iron bell and spigot pipe and fittings with rubber ring push-on joints.
   3. Hubless, coated, cast iron pipe, fittings, and joint couplings.

4. DWV copper tubing, with cast brass or wrot copper drainage pattern fittings, and joints made with Type 3 solder.

I. Drainage (Storm) Above Ground:
1. Service weight, coated, cast iron bell and spigot pipe and fittings, with calked joints.
2. Service weight, coated, cast iron bell and spigot pipe and fittings, with rubber ring push-on joints.
3. Hubless, coated, cast iron pipe, fittings and joint couplings.
4. DWV copper drainage tube, with cast copper alloy or wrot copper drainage pattern fittings, and joints made up with Type 3 solder.

J. Drainage Piping (Below Ground):
1. Option No. 1: Service weight, coated, cast iron bell and spigot pipe and fittings, with calked joints.
2. Option No. 2: Service weight, coated, cast iron bell and spigot pipe and fittings, with rubber ring push-on joints.

K. Natural Gas Piping including associated vent:
1. Inside Building: Standard weight black steel pipe, with 150 lb malleable iron fittings, and threaded joints.

L. Vent Piping: Same materials that are used for piping system to which vent is connected.

END OF SECTION

PART 1 GENERAL

1.01 **SECTION INCLUDES**

A. Reduced pressure zone principle device

B. Double check valve device

C. Atmospheric vent

1.02 SUBMITTALS

A. Product Data:
   1. Manufacturer's catalog sheets, specifications, and installation instructions for each type backflow preventer and test kit.

1.03 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Comply with the State Department of Health Sanitary Code for Cross Connection Control, and the other standards listed in Part 2 of this section.
   2. Where conflicts occur between the referenced standards, the most stringent requirements shall apply.

1.04 MAINTENANCE

A. Special Tools (as furnished or recommended by the backflow preventer manufacturer). Deliver to the Building Owner:
   1. Test Kit A: Portable, packaged in a substantially built, compartmented carrying case, containing hose, gauge, and fittings required for testing backflow preventer for proper operation, and printed procedure for conducting test.
   2. Test Kit B: Sight tube, of required length, for testing backflow preventer for proper operation, and printed procedure for conducting test.

PART 2 PRODUCTS

2.01 BACKFLOW PREVENTERS

A. Type A: Reduced Pressure Zone Principle device, with atmospheric vent, conforming to ASSE Standard 1013, AWWA C-511, and USC specifications manual for Cross Connection Control.
   1. Performance: 150 psig, and 130 degrees F maximum working conditions.
   2. Assembly: Strainer and gate valve on inlet side, gate valve on outlet side, and four test cocks, all as furnished or recommended by the backflow preventer manufacturer.
   3. Acceptable Manufacturer's: Watts, Zurn Wilkins, Febco

B. Type B: Double Check Valve device, conforming to ASSE Standard 1015, AWWA C-510, and USC specifications manual for Cross Connection control.
   1. Performance: 150 psig, and 130 degrees F, maximum working conditions.
   2. Assembly: Strainer and gate valve on inlet side, gate valve on outlet side, and four test cocks, all as furnished or recommended by the backflow preventer manufacturer.
   3. Acceptable Manufacturer's: Watts, Zurn Wilkins, Febco

C. Type C: Atmospheric vent, conforming to ASSE 1012.
   1. Performance: 175 psig and 210 degrees F maximum working conditions.
   2. Assembly: Internal strainer, and union connections.
   3. Acceptable Manufacturer's: Watts, Zurn Wilkins, Febco

PART 3 EXECUTION

3.01 INSTALLATION

A. Install the Work of this section in accordance with the manufacturer's printed installation instructions.

B. Atmospheric Vent: Pipe vent to spill over closest point of drainage, as directed, maintaining a minimum 12 inch air gap above the drain.
   1. Install air gap fitting when shown, or if atmospheric vent must be connected to drainage line. See Section 220576.

3.02 FIELD QUALITY CONTROL

A. Operation Test: Test kit as specified under Part 1 of this section may be used. Conduct test in the presence of the Owner's Representative.
   1. Type A Backflow Preventer: Test the device with the test kit in accordance with the manufacturer's test procedures.
   2. Type B Backflow Preventer: Test the device with the test kit in accordance with the manufacturer's test procedure.
   3. Type C Backflow Preventer: Test at 125 psi hydrostatic pressure, and hold for four hours; check for leaking.

B. Re-testing: Repair or replace any device failing the operation test, and repeat the test.

END OF SECTION

PART 1 GENERAL

1.01 **SECTION INCLUDES**

A. Water hammer arrestors

B. Hose bibbs

C. Drain valve

D. Flush wall hydrants

E. Fasteners

1.02 SUBMITTALS

A. Product Data: Catalog sheets, specifications, dimensional data, and installation instructions for each item specified, excluding fasteners.

1.03 MAINTENANCE

A. Special Tools: Deliver to the Owner's Representative.
   1. Wall Hydrant T-Handle Locking Key: One for each wall hydrant.
   2. Tools For Vandal Resistant Fasteners: One for each type and size.

PART 2 PRODUCTS

2.01 WATER HAMMER ARRESTORS

A. Hydropneumatically controlled with permanently sealed expansion chamber pre-charged with non-combustible gas, threaded connection, and conforming to ASME A112.26.1M - Water Hammer Arrestors, and ASSE 1010 - Water Hammer Arrestors.
   1. Bellows Type: Stainless steel construction with elastomer or stainless steel bellows.
   2. Piston Type: Hard drawn copper body with brass piston, cap and adapter; and elastomer seals.

2.02 HOSE BIBBS

A. Compression type with polished chrome plated bronze body, renewable units, vacuum breaker with breakaway screw or vandal resistant fastener (ASSE 1011), removable T-handle, and integral threaded wall flange.
   1. Connections: 3/4 inch female threaded inlet, and 3/4 inch hose bibb outlet.

2.03 DRAIN VALVE

A. Cast brass body with renewable units, hose bibb vacuum breaker (ASSE 1011) with drainage feature, and removable cast iron handwheel with vandal resistant fastener.
   1. Valve must be completely assembled to make hose connection.
   2. Connections: 1/2 or 3/4 inch threaded or solder end inlet, and 3/4 inch hose bibb outlet.

2.04 FLUSH WALL HYDRANTS

A. Non-freeze anti-siphon type with bronze body, polished nickel bronze or polished chrome bronze face plate, bronze operating parts, integral non-removable vacuum breaker (ASSE 1011), protruding valve stem and hose nozzle, renewable units, loose key operation, and conforming to ASME A112.21.3M - Hydrants for Utility and Maintenance Use.

1. Connections: 3/4 inch female threaded or solder connection, or one inch male threaded inlet; and 3/4 inch hose bibb outlet.

2.05 FASTENERS

A. Vandal Resistant Fasteners: Torx head with center pin.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install the Work of this section in accordance with the manufacturer's printed installation instructions, unless otherwise specified.

B. Wall Hydrants:
   1. Installation Height: Minimum 18 inches above finished grade.

C. Secure external components in place with vandal resistant fasteners or devices which cannot be removed without special tools.

END OF SECTION

PART 1 GENERAL

1.01 **SECTION INCLUDES**

A. Thermometers

B. Thermometers for measuring liquid temperature

C. Pressure and compound gagues

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Valves: Section 220523.

B. Pumps: Section 221123.

1.03 SUBMITTALS

A. Product Data: Manufacturer's catalog sheets, specifications and installation instructions for each item specified.

1.04 QUALITY ASSURANCE

A. Regulatory Requirements: Where Federal, NSF, ASME or other standards are indicated or required, products shall meet or exceed the standards established for material, quality, manufacture and performance.

PART 2 PRODUCTS

2.01 MANUFACTURERS/COMPANIES

A. Dresser Instruments.

B. Marsh Bellofram.

C. Moeller Instrument Co.

D. Taylor Precision Products.

E. H.O. Trerice Co.

F. Weksler Instruments Corp.

2.02 THERMOMETERS

A. General Design Features:
   1. Scale Ranges: 1-1/2 times actual working temperature required for the particular application, as approved.
      a. Maximum of two degrees between graduations and ten degrees between numerals.
      b. When scale ranges are in excess of 100 degrees, maximum range between numerals may be 20 degrees, or as otherwise approved for the particular application.
   2. Direct Reading Thermometers: Bimetallic actuated, dial type, straight pattern, angle pattern, or adjustable angle pattern as required.
   3. Remote Reading Thermometers: Vapor tension actuated, or gas actuated type, with extension capillary tube of length as required for the particular application.
      a. Case type as required for the particular mounting application.

4. Thermometers for Sensing Liquid Temperature: Furnish with separable sockets.
    a. Sockets for Use in Insulated Piping, Insulated Tanks or Similar Equipment: Extension lagging neck type, of length as required to compensate for insulation thickness, and proper immersion..

2.03 THERMOMETERS FOR MEASURING LIQUID TEMPERATURE

A. Bimetallic Actuated Thermometers: Comply with ASME B40.3, Accuracy Grade A.
    1. Construction: Type 304 stainless steel, all welded construction, with clear acrylic plastic or shatterproof glass crystal.
    2. Dial: White enamel background with bold black figures and graduations.
    3. Head Size:
        a. Installation in Piping: 3inch diameter.
        b. Installation in Tanks and Similar Equipment: 5 inch diameter.
    4. Stem: Length as required for proper immersion, and to compensate for insulation thickness, with threaded connection for socket.
    5. External Calibration Device.
    6. Separable Socket:
        a. Water Service: Brass or bronze.

B. Vapor Tension or Gas Actuated Capillary Thermometers: Adjustable type, with micrometer type pointer or external calibration device, of design and materials as follows:
    1. Case and Ring: Stainless steel or non-ferrous material as approved, with clear acrylic or shatterproof glass lens. Provide case of type as required for the particular mounting application. Case adjustable, allowing rotation of 360°, and stem adjustment of at least 180°. Provide set screw for locking case in desired position.
    2. Movement: Brass with bronze bearings.
    3. Dial: White enamel background, with bold black graduations, numerals and pointer; 3-1/2 inch diameter.
    4. Capillary: Stainless steel.
    5. Bulb: Copper with union well connection.
    6. Separable Socket:
        a. Water Service: Brass or bronze.

2.04 PRESSURE AND COMPOUND GAUGES

A. Type: Adjustable dial type with micrometer type pointer, or external calibration device, bronze bourdon tube, and bronze bushed rotary movement.

B. Dial: White enameled background, and bold black graduations, numerals and pointer; 3-1/2 inch diameter.
    1. Scale Range:
        a. Standard Gauges: Double normal operating pressure.
        b. Compound Gauges: From 30" Hg vacuum to double normal operating pressure.

C. Case: Cast aluminum, brass, or black finished phenolic.

D. Accuracy: Guaranteed of within 1 percent in middle third of dial range.

PART 3 EXECUTION

3.01 INSTALLATION

A. Thermometers:
    1. Install in accordance with the manufacturer's printed installation instructions.

2. Install direct reading thermometers, when the application requires installation 6 feet or less above the floor or bottom of space in which installed, and remote reading type when the installation is over 6 feet.

B. Pressure and Vacuum Gauges:
   1. Install in accordance with the manufacturer's printed installation instructions.
   2. For measuring liquid pressure, install gauges complete with stop cocks and drain cocks.

C. Pressure Snubbers and Impulse Dampers:
   1. Install pressure snubbers in the piping connections to gauges installed in suction and discharge piping connections to close coupled and base mounted circulating pumps driven by motors under 10 HP.
   2. Install impulse dampers in the piping connections to gauges installed in suction and discharge piping connections to close coupled and base mounted circulating pumps driven by motors 10 HP and over.

END OF SECTION

PART 1 GENERAL

1.01 **SECTION INCLUDES**

A. General pump requirements

B. Requirements for circulating water pumps

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Wiring for Motors and Motor Controllers: Section 260523.

B. Motors and Motor Controllers: Section 260221.

1.03 SUBMITTALS

A. Product Data: Catalog sheets and installation instructions for each type or size pump.

B. Schedule: Pump schedule showing pump specifications and application.

C. Quality Control Submittals:
1. Performance curves for each pump, showing gpm, brake HP and efficiency from free delivery to shut-off. Chart curves on manufacturer's factory tests shall be conducted in accordance with the recommended procedures of the Hydraulic Institute, and certified thereto by the manufacturer.

D. Contract Close Out Submittals:
1. Operation, Maintenance Data, and Parts Lists: Deliver 2 copies, for each type of pump or pumping apparatus, to the Owner's Representative.

1.04 MAINTENANCE

A. Spare Parts: Deliver one spare set of mechanical seals for each size and type of pump equipped with mechanical seals, to the Owner's Representative, who will sign receipt for same. Furnish seals of type as required for the particular pump application and the chemical water treatment being utilized. Suitably box and label spare seals as to their usage.

PART 2 PRODUCTS

2.01 PUMPS - GENERAL

A. Design pumps to operate continuously without overheating bearings or motors at every condition of operation on the pump curve, or produce noise audible outside the room or space in which installed.

B. Equip pumps complete with electric motor and drive assembly, unless otherwise indicated. Design pump casings for the indicated working pressure and factory test at 1-1/2 times the designed pressure.

C. Manufacture domestic hot water pumps of all-bronze construction.

D. Pumps of the same type, shall be the product of a single manufacturer, with pump parts of the same size and type interchangeable.

2.02 CIRCULATING WATER PUMPS

A. In-Line Pump: Single stage volute type pump, with Bronze impeller, replaceable mechanical seals, oil lubricated shaft sleeve bearings, and cast iron casing with flanged inlet and outlet connections. Direct connect pump to electric motor with flexible coupling.
   1. Motor Requirements (Supplementary to Section 260221):
   2. Equip motor with built-in thermal overload protection.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in-line circulating pumps between pipe flanges in piping systems. Install overhead pipe supports, both sides of in-line pumps, installed in horizontal piping runs.

B. Timer and aquastat to be wired to the Circulating Pump for Building Owner flexibility.

END OF SECTION

PART 1 GENERAL

1.01 **SECTION INCLUDES**

A. Requirements for gas-fired water heaters

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Valves: Section 220523.

B. Electric Work: Division 26.

1.03 SUBMITTALS

A. Product Data: Catalog sheets, specifications and installation instructions for each water heater.

B. Contract Closeout Submittals:
1. Operation and Maintenance Data: Deliver 2 copies, covering the installed products, to the Owner's Representative.
2. Warranty: Copy of specified warranty.

1.04 REGULATORY REQUIREMENTS

A. Water heater shall be UL listed and labeled.

B. Comply with the State Energy Conservation Construction Code.

1.05 WARRANTY

A. Manufacturer's Warranty: Three year warranty for the glass lined water heater tank.

PART 2 PRODUCTS

2.01 **GAS-FIRED WATER HEATER**

A. Tank: Welded steel, factory tested at 300 psi and rated for 150 psi working pressure.
1. Glass lining permanently bonded to tank interior surface.
2. Tank nipples factory installed.
3. Renewable magnesium anode.
4. Corrosion resistant dip tube.
5. Drain and relief valve tapping.
6. Renewable bronze boiler drain.

B. Burner: Aluminized steel or cast iron, adjustable, or self-adjusting air-gas mixture control.

C. Thermostat: Automatic, adjustable, with automatic pilot, overheat control, and pilot operated automatic gas shut off.

D. Outer Casing: Steel, with baked enamel or acrylic finish.
1. Access door for servicing controls and burner.

E. Pressure-Temperature Relief Valve: AGA Z21.22; bronze body with stainless steel internals and threaded blow-off connection.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install the Work of this section in accordance with the manufacturer's printed installation instructions, unless otherwise specified.

B. Install the water heater on a level, firm base.

C. Install the pressure-temperature relief valve in the dedicated tank tapping. Pipe the relief valve blow-off to a point 6 inches above the floor.

D. Provide ball valves on hot and cold water connections.

E. Make final piping connections with unions.

F. Flush and fill tank. Do not switch on heating elements until tank is full and entrapped air is eliminated.

END OF SECTION

PART 1 GENERAL

1.01 **SECTION INCLUDES**

A. Mop service sink

B. Lavatory

C. Supports and supporting devices for wall-mounted lavatories, sinks, and equipment

D. Countertop sink

E. Vitreous china water closets

F. Water closet carrier

G. Vitreous china urinals

H. Urinal carrier

I. Flush valves

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Sealants: Section 079200.

1.03 SUBMITTALS

A. Product Data: Catalog sheets, specifications, roughing dimensions, and installation instructions for each item specified except fasteners.
   1. Deliver cut out data for countertop fixtures to the Owner's Representative.

B. Samples:
   1. Water Closet Seat: One seat if other than product specified. Sample will be returned and if approved, may be installed on the Project.

1.04 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Comply with applicable requirements of FS WW-P-541, and the following standards:
      a. ANSI/ASME A112.6.1M - Floor Affixed Supports for Off-the-Floor Plumbing Fixtures for Public Use.
      b. ANSI/ASME A112.18.1M - Plumbing Fixture Fittings.
      c. ANSI/ASME A112.19.1M - Enameled Cast Iron Plumbing Fixtures.
      d. ANSI/ASME A112.19.2M - Vitreous China Plumbing Fixtures.
      e. ANSI/ASME A112.19.6 - Hydraulic Requirements for Water Closets and Urinals.
   2. Materials and installations designated as handicapped accessible shall conform with the following:
      a. ANSI A117.1 - Buildings and Facilities - Providing Accessibility and Usability for Physically Handicapped People.
      b. The Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG), (Appendix A to 28 CFR Part 36).
      c. The Uniform Federal Accessibility Standards (UFAS), (Appendix A to 41 CFR Part 101-19.6).

3. Each fixture carrier support shall be listed by model number in the fixture support manufacturer's Fixture Support Selection Guide as being recommended for support of the appropriate fixture.

B. Plainly and permanently mark each fixture and fitting with the manufacturer's name or trade mark.

C. Acid resistant surfaces shall be plainly and permanently marked with the manufacturer's label or symbol indicating acid resistance.

1.05 MAINTENANCE

A. Special Tools: Deliver to the Owner's Representative.
1. Furnish the following tools labeled with names and locations where used.
a. Keys for stops (furnished with stops).
b. Tools for Vandal Resistant Fasteners: Two for each type and size.

PART 2 PRODUCTS

2.01 MATERIALS - GENERAL

A. Vitreous China: First quality, smooth, uniform color and texture, with fused on glaze covering surfaces exposed to view.
1. Surfaces shall be free of chips, craze, warpage, cracks and discolorations. Surfaces in contact with walls or floors shall be flat, with warpage not to exceed 1/16 inch per foot.
2. Color: White.

B. Porcelain Enameled Cast Iron: Smooth, uniform color and texture, having fused on glaze covering surfaces exposed to view.
1. Material shall show no cracks, chips, craze or discolorations.
2. Enameled surfaces shall be acid resistant unless otherwise specified.
3. Color: White.

C. Fixture Trim: Brass, bronze, or stainless steel construction; consisting of supply and waste fittings, faucets, traps, stop valves, escutcheons, sink strainers, nipples, supplies, and metal trim.
1. Brass piping: Ips standard weight, with standard weight, 125 lb cast brass fittings.
2. Brass tubing: 18 B & S gage.
3. Stainless steel: 18-8 Type 302 or 304 unless otherwise specified.

D. Fixture Trim Finishes:
1. Brass or Bronze: Polished or satin finished chrome plating, 0.02 mil chromium over 0.2 mil nickel plating.
2. Stainless Steel: Invisible welds and seams, and unless otherwise specified, polished to No. 4 commercial finish.

E. Fixture Hold-down Bolts: Steel, plated for corrosion resistance.
1. Cap nuts: Metal, polished and chrome plated.

F. Combination Faucets: Faucets shall turn counter to each other for the on and off positions.

G. For Vandal Resistant Fixtures - Fasteners: Torx head with center pin.

2.02 MOP SERVICE SINK

A. Receptor – See plans for make and model:

B. Drain Fitting: Cast iron or cast brass body integral or attached to the receptor, ready for connection. Strainer grate shall be polished brass or stainless steel, removable for cleaning.

C. Service Fitting: Combination faucet with 3/4 inch hose end spout, and with the following features.
   1. 1/2 inch eccentric inlets on 8 inch centers and integral stops.
   2. Integral wall flanges.
   3. Renewable units.
   4. Metal, four arm or lever, indexed handles.
   5. Integral vacuum breaker.
   6. 10 inches from finished wall to center of spout outlet.
   7. Five foot rubber hose with threaded connector to fit the hose bibb.
      a. Hose wall hook.

D. Rim Guard: Anodized aluminum, stainless steel, or pre-molded vinyl plastic, as recommended by the receptor manufacturer.

E. Wall Guard: Anodized aluminum, stainless steel, or pre-molded vinyl plastic, as recommended by the receptor manufacturer.

2.03 LAVATORY

A. Fixture: See plans for make and model.

B. Supply Fitting: See plans for make and model.
   1. Maximum Flow: 0.5 gpm at 80 psi.
      a. Exception: Metering faucets shall have a maximum flow of 0.25 gallons per cycle.
   2. Over rim spout with aerator.
   3. Renewable operating units.
   4. Vandal resistant assembly.
   5. 1/2 inch inlet lock nut and coupling nut.
   6. Operators:
      a. Standard Fixtures: Metal four arm indexed handles, with either integral splines, or ceramic spline inserts. Plastic spline inserts will not be accepted.
      b. Handicapped Accessible Fixtures: Metal 4 inch minimum indexed blade handles set, with either integral splines, or ceramic spline inserts. Plastic spline inserts will not be accepted.
         1) Maximum Activation Force: 5 lbf.

C. Waste Fitting: Grid Strainer.
   1. Metal grid strainer to match fixture finish.
   2. Cast escutcheon.
   3. 1-1/4 inch tailpiece.
   4. Vandal resistant assembly.

D. Trap: Cast brass, non-adjustable P trap, 1-1/4 inch tubing inlet, 1-1/2 inch ips outlet.
   1. Bottom cleanout plug.
   2. Ips brass nipple with solid cast brass escutcheon.

E. Supplies: 3/8 inch ips brass with operated stops and solid cast brass escutcheons.
   1. Wall Supplies: Angle stops.

F. Faucet Hole Cover: Cast brass, rounded top, and threaded shank, with backing plate, lock washer and nut.

2.04 FIXTURE SUPPORTS AND SUPPORTING DEVICES FOR LAVATORIES, SINKS, AND EQUIPMENT

A. General: Ferrous metal members of carriers and supporting devices with the exception of chrome plated or porcelain enameled cast iron, shall be factory painted for corrosion resistance.

B. Floor Mounted Carrier Supports: Steel pipe uprights, 1-1/4 inch ips minimum diameter, or 1 inch x 3 inch steel tubing uprights, with cast iron or welded steel feet, drilled for bolting to the floor construction. Each carrier shall be provided with the appropriate fixture supporting devices specified, or recommended by the carrier manufacturer's Fixture Support Selection Guide.
   1. Concealed Arms: Steel, with fixture locking lugs, leveling screws and a means of attaching, positioning and securing the fixture to the carrier.
      a. Trim: Polished, chrome plated metal escutcheon to space fixture two inches from the wall.
      b. Vandal Resistant Trim: Polished, chrome plated metal cap nuts and washers retained with vandal resistant set screws or other approved means of securing trim.

C. Wood Stud Filler Piece: 2 inch x 8 inch wood planking cut to fit between wood studding. Fasten with four 3/8 inch x 2-1/2 inch lag bolts with washers.

2.05 COUNTERTOP SINK

A. Material: See plans for make and model.
   1. Features: Self-rimming, extended back ledge, with faucet and spray hose punchings spaced on 4 inch centers. Cove corners 1-3/4 inch minimum radius; fully coat underside with sound deadening and condensation barrier.
   2. Finish: Satin finish exposed surfaces.

B. Supply Fitting: See plans for make and model.
   1. Maximum Flow: 2.5 gpm at 80 psi.
   2. 8 inch swing spout.
   3. 1/2 inch inlets on 8 inch centers.
   4. Renewable units.
   5. Supplies: 1/2 inch ips brass, with angle stops, and cast brass escutcheons.

C. Drain Assembly:
   1. Stainless steel removable strainer basket with neoprene stopper and 1-1/2 inch tubing tailpiece.

D. Fastening Devices: Stainless steel spring clip assemblies or clamping devices for securing sink to the countertop.

2.06 VITREOUS CHINA WATER CLOSETS

A. Fixtures: See plans for make and model.

B. Vitreous china, full size, elongated bowl with integral flushing rim and jet; trapway at the rear and the outlet centered between a pair of hold down bolt holes.
   1. Trapway size: Pass minimum ball of 2 inches.
   2. Trap seal: 2 inches minimum.
   3. Water surface area: 12 inches x 10 inches minimum.
   4. Provisions for flushing:
      a. 1-1/2 inch spud for flush valve operation.
   5. Floor Supported Fixture Heights:
      a. Standard Fixture: 14 to 15 inches from finished floor to rim.

b. Handicapped Accessible Fixture: 17 to 19 inches from finished floor to top of seat (15-13/16 to 17-13/16 inches from finished floor to top of rim based on 1-3/16 inch seat height).

C. Operation: Fixture shall flush satisfactorily without extraordinary rise of water level in the bowl.
1. Maximum gallons of water per flush: 1.28 gallons.

D. TYPE F WATER CLOSET: Flush Tank: Vitreous china secured to and supported by the closet bowl and separate lift off cover with provisions for locking.
1. Float valve with nylon seat and vacuum breaker.
2. Flushing valve.
3. Metal trip lever.
4. Supply: 1/2 inch ips brass pipe with a key operated stop and solid cast brass escutcheon.

E. TYPE A, C, F WATER CLOSETS: Water Closet Floor Flange:
1. For Use with DWV Copper Tubing: Cast brass, 48 ounce minimum weight.
2. For Use with Cast Iron Soil Pipe: Cast iron, 90 ounce minimum weight.

F. Closet Seat: Extra heavy duty, commercial design; Model 1655-C by Bemis Mfg. Co., Model No. 527-CH by Beneke Corp., or Model No. 9500C by Church Seat Co.
1. Material and Construction: Solid plastic, open front, less cover, molded in one piece with no joints, seams or crevices.
2. The manufacturer’s name shall be molded into the seat.
3. Metal check hinges shall be integrally molded into the seat. Hinges, inserts, bearings and posts shall be of brass or stainless steel. Cover upper post and metal exposed above fixture rim with plastic to match seat.
4. Surface shall be hard, polished, impervious to moisture, and not affected by the action of uric acid.
5. Color: White.

G. Water Closet Types:
1. Type A Water Closet: Floor supported, floor outlet, top spud inlet, siphon jet action, activated by an exposed flush valve.
2. Type C Water Closet: Floor supported, floor outlet, top spud inlet integral seat, siphon jet action, operated by means of an exposed flush valve.
3. Type E Water Closet: Wall hung, back outlet, back spud inlet, siphon jet action, activated by means of a concealed flush valve.
4. Type E-1 Water Closet: Wall hung, back outlet, top spud inlet, siphon jet action, activated by means of an exposed flush valve.
5. Type E-2 Water Closet: Wall hung, back outlet, back spud inlet, integral seat, siphon jet action, operated by means of a concealed flush valve.
6. Type F Water Closet: Floor supported, close coupled fixture-tank combination, floor outlet, siphon jet action, flush tank operated.

2.07 WATER CLOSET CARRIER

A. Closet Carrier (For Wall Hung Water Closets): Commercial type cast iron combination chair carrier and drainage fitting with the following:
1. Face Plate: Cast iron; height adjustable.
2. Feet: Cast iron, adjustable, with provisions for bolting to the floor slab.
3. Studs, Nuts and Washers: Steel, treated for corrosion resistance.
4. Fixture Washers: Plastic.
5. Adjustable Closet Connection: Cast iron, steel, or ABS plastic.
6. Fitting Ends: Compatible with the drainage piping system.
7. Gasket: Impregnated felt or neoprene closet gasket; lead or neoprene face plate gasket.

8. Stud thread protectors.
9. Factory painted.
10. Trim: Polished chrome plated metal cap nuts and washers.
11. Vandal Resistant Trim: Polished chrome plated metal cap nuts and washers retained with vandal resistant set screws.

B. Closet Carrier (Residential For Wall Hung Water Closets): Cast iron or formed steel combination fixture carrier with waste fitting, or fixture carrier with fitting adapter, and arranged for mounting to wood studding. Include the following:
1. Closet Connection: Cast iron or steel with “O” ring seal; brass for copper drainage systems; adjustable.
2. Closet Gasket: Impregnated felt or neoprene.
3. Waste Fitting: Same material as drainage piping.
4. Studs, Nuts and Washers: Steel, treated for corrosion resistance.
5. Fixture Washers: Plastic.
6. Stud thread protectors.
7. Factory painted.
8. Trim: Polished chrome plated metal cap nuts and washers.
9. Vandal Resistant Trim: Polished chrome plated metal cap nuts and washers retained with set vandal resistant screws.

C. Ferrous metal members of carriers and supporting devices with the exception of chrome plated or porcelain enameled cast iron, shall be factory painted for corrosion resistance.

2.08 VITREOUS CHINA URINALS

A. Wall Supported Fixture: Vitreous china, with elongated rim, integral trap and extended side shields.
1. Dimensions (approx.): 28 inches high, 18 inches wide, 12 inches front to back.
2. Method of Support: Wall hangers and lugs for bearing plate bolting.

B. Operation: Fixture shall flush satisfactorily with a maximum of 0.5 gallons of water and be accomplished without extraordinary rise in water level in the bowl.

C. Fixture Types:
1. Type A Urinal: Floor supported, siphon jet action, with a bottom outlet and a 1-1/4 inch top spud inlet for an exposed flush valve connection.
2. Type B Urinal: Wall supported, blowout action, back outlet and a 1-1/4 inch back spud inlet for a concealed flush valve connection.
3. Type B-1 Urinal: Wall supported, blowout action, back outlet and a 1-1/4 inch top spud inlet for an exposed flush valve connection.
4. Type C Urinal: Wall supported, washout action, back outlet, and a 3/4 inch back spud inlet for a concealed flush valve connection.
5. Type C-1 Urinal: Wall supported, washout action, back outlet, and a 3/4 inch top spud inlet for an exposed flush valve connection.

2.09 URINAL CARRIER

A. Floor Mounted Carrier Support (For Wall Hung Urinals): 1-1/4 inch ips steel pipe upright supports with block feet arranged with provisions for bolting to the floor slab, and with the following:
1. Hanger Plate: Steel, height adjustable with provisions for mounting and positioning the fixture hanger.
2. Bearing Plate: Steel, adjustable, with bearing studs, nuts and washers.
3. Studs, Nuts and Washers: Steel, treated for corrosion resistance.

4. Fixture Washers: Plastic.
5. Stud thread protectors.
6. Factory Painted.
7. Trim: Polished chrome plated metal cap nuts and washers.
8. Vandal Resistant Trim: Polished chrome plated metal cap nuts and washers retained with vandal resistant set screws.

B. Ferrous metal members of carriers and supporting devices with the exception of chrome plated or porcelain enameled cast iron, shall be factory painted for corrosion resistance.

2.10 FLUSH VALVES

A. Control Mechanism: Diaphragm or piston operated; do not intermix types. See plans for make and model.

B. Maximum Flow Per Flush:
1. Water Closet: 1.28 gallons.
2. Urinal: 0.5 gallons.

C. Flush Valve Assemblies: Flush valve, stop-check, tailpiece, vacuum breaker, and fixture spud coupling, including wall and spud flanges.

D. Valve Materials:
1. Valve Body: Brass or bronze.
2. Valve Internal Parts: Corrosion resistant materials that will not be affected by the action of or contact with water.

E. Operating Features:
1. Valve operators shall employ the non hold-open feature.
2. Piston type valves shall be field adjustable.

F. Valve Operators:
1. Oscillating Handle: 4 inch brass spring loaded self return handle.
2. Oscillating Disc: 3 inch diameter, cast brass, spring loaded and self returning.
   a. Concealed Installations: Furnish wall escutcheon with operators.
3. Push Button Operator: 1 inch cast brass spring loaded push button, wall escutcheon, sleeve with guides and brass push rod; vandal resistant assembly.
4. Maximum Activation Force (Handicapped Accessible Operators): 5 lbf.

G. Assembly Components:
1. Flush Pipe: Seamless brass tubing with integral vacuum breaker, No. 18 B & S gage.
2. Fitting: Cast brass.
3. Stop-Check: Brass or bronze body, non rising stem stop valve with a built-in automatic check.
   a. Exposed Stop-Check: Screwdriver operated with protective cap.
   b. Concealed Stop-Check: Wheel handle operated.
4. Spud Coupling and Wall Flanges: Cast brass.

PART 3 EXECUTION

3.01 FIXTURE SUPPORT AND SUPPORTING DEVICE INSTALLATION

A. Install heavy duty floor mounted carrier supports with specified fixture supporting devices for wall type plumbing fixtures.

1. Secure to building construction with lag bolts and metal expansion shields, or other appropriate means as required by the construction encountered.

B. Wall Mounted Carrier Supports: Install the following fixtures on wall mounted carrier supports:

C. Fixture Supporting Devices: Attach fixtures by means of the following fixture supporting devices attached to carrier supports.

FIXTURE	SUPPORTING DEVICE
Clinical Service Sink	Fixture hangers & bearing
Lavatory, Vitreous China, with back	Concealed arms.
Lavatory, Vitreous China, slab type	Concealed arms.
Lavatory, Type D	Concealed arms.
Lavatory, Type E	Through bolt.
Water Closet	Bolt to comb. carrier and drainage fitting.
Urinal	Fixture hanger and bearing plate.
Drinking Fountain	Fixture hanger.
Water Cooler (wall mounted)	Fixture hanger.
Water Cooler (Recessed)	Mounting frame.

D. Secure exposed external components in place with vandal resistant fasteners or devices which cannot be removed without the use of special tools.

3.02 FIXTURE INSTALLATION

A. Install the Work of this section in accordance with the manufacturer's printed installation instructions.

B. Install fixtures level and at proper height, tighten connections, and install hold-down bolts, cap nuts and cover plates, where required.

C. Secure exposed external components in place with vandal resistant fasteners or devices which cannot be removed without the use of special tools.

D. Bathtubs:
1. Residential Type:
   a. Caulk joint between fixture wall and floor with Type 1D sealant; strike a neat joint.

E. Mop Service Sinks:
1. Set receptor leveled in bed of mortar laid on clean roughened surface. Remove excess mortar and strike a neat joint.
2. Make connection from drainage pipe to receptor drain.
3. Caulk joints between receptor and wall or floor with Type 1D sealant; strike a neat joint.
4. Install service fittings.

F. Lavatories:
1. Mount lavatories 31 inches from finished floor to rim unless otherwise specified.
2. Mount handicapped accessible fixtures 34 inches from finished floor to rim. Refer to Standard Drawing No. 93/S3013 bound herein, for special clearances required for handicapped accessible fixtures.
3. Caulk joint between fixture back and wall with Type 1D sealant; strike a neat joint.

G. Countertop Fixtures:
   1. Install fixture with securing devices supplied.
   2. Set fixture on bedding of sealant, tighten securing devices and remove excess sealant.

H. Water Closets:
   1. Wall Hung Fixtures:
      a. Standard Fixtures: Install wall hung fixtures 15 inches from finished floor to rim unless otherwise specified.
      b. Handicapped Accessible Fixtures: Install fixtures 18 inches from finished floor to top of seat (16-13/16 inches floor to rim based on 1-3/16 inches seat height).
      c. Set bearing nuts to position fixture 1/16 inch clear of finished wall.
      d. Caulk the joint between fixture back and wall with Type 1D sealant; strike a neat joint.
   2. Floor Supported Fixtures:
      a. Set fixture in bed of setting compound; remove excess.
      b. Caulk base perimeter with Type 1D sealant; strike a neat joint.
   3. After connections are tightened, install cap nuts and washers.
   4. Install water closet seats when directed.

I. Urinals:
   1. Wall Hung Fixtures:
      a. Standard Fixtures: Install wall hung fixtures 24 inches from finished floor to rim.
      b. Handicapped Accessible Fixtures: Install wall hung handicapped accessible fixtures 14 inches (minimum) to 17 inches (maximum) from finished floor to rim.
      c. Set bearing nuts on floor mounted carrier supports to position wall hung fixtures 1/16 inch clear of finished wall.
      d. Caulk the joint between fixture back and wall with Type 1D sealant; strike a neat joint.
   2. Floor Supported Fixtures:
      a. Install lip of urinal below floor level for proper floor drainage.
      b. Set fixture in bed of setting compound; remove excess.
      c. Caulk perimeter of fixture with Type 1D sealant; strike a neat joint.
   3. After connections are tightened, install cap nuts and washers.

J. Flush Valves:
   1. Standard Fixtures: Install flush valves on fixture centerline, and at following heights above fixture rim or back to centerline of water inlet to flush valve.
      a. Water Closet: 11-1/2 inches.
      b. Urinal: 11-1/2 inches.
   2. Handicapped Accessible Fixtures: Install flush valves on fixture centerline, and at following height above finished floor to centerline of flush valve operator. Distance between centerline of flush valve operator and centerline of water inlet is 1-1/2 inches.
      a. Water Closet: Approximately 31-1/2 inches, and mounted on wide side of stall.
         1) Coordinate mounting height with Construction Work Contractor to avoid interference with grab bar, and to facilitate flush valve servicing.
      b. Urinal: Maximum 44 inches.
   3. Set oscillating handles parallel to wall on exposed installation.
   4. Slip joints in flush pipe connections allowed only at fixture spud and vacuum breaker ends; others shall be screwed connections.
   5. Score tubing ends before assembling to assure tight slip joint connections. No score marks shall be visible after assembly.
   6. In utility corridors, solder screwed flush pipe connections.

3.03 CLEANING, FLUSHING AND ADJUSTMENT

A. Clean fixture and trim. Remove grease and dirt; polish surfaces but leave stickers and warning labels intact.

B. Flush supply piping and traps; clean strainers.

C. Adjust stops for proper delivery.

D. Adjust metering faucets for proper timing.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General requirements for drinking fountains

B. ADA-compliant drinking fountain requirements

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Fixture Carrier Supports: Section 224200.

1.03 SUBMITTALS

A. Product Data: Manufacturer's catalog sheets, specifications and installation instructions for each type drinking fountain.

B. Contract Closeout Submittals:
   1. Operation and Maintenance Data: Deliver 2 copies, covering the installed products, to the Owner's Representative.

1.04 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Comply with applicable requirements of FS WW-P-541 unless otherwise specified.
   2. Comply with the Federal Safe Water Drinking Act of 1986, and the Federal Lead Contamination Control Act of 1988.
   3. Materials and installations designated as handicapped accessible shall conform with the following:
      a. ANSI A117.1 - Buildings and Facilities - Providing Accessibility and Usability for Physically Handicapped People.
      b. The Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG), (Appendix A to 28 CFR Part 36).
      c. The Uniform Federal Accessibility Standards (UFAS), (Appendix A to 41 CFR Part 101-19.6).

PART 2 PRODUCTS

2.01 DRINKING FOUNTAINS

A. Type: Wall mounted, factory assembled, complete with trap, shut off valve and wall hanger.

B. Body: Polished or satin finished stainless steel, 18 gauge or heavier; with rounded corners, anti-splash back, and receptor contoured to eliminate splashing.

C. Features: Self closing supply valve, automatic stream regulator, two stream mound building projector and removable brass strainer plate.
   1. All exposed brass trim polished and chrome plated.

D. Selections: Refer to Contract Documents for Manufacturer and Model Number.
   1. Approved Manufacturers:
      a. Elkay, Murdock, Haws, Halsey Taylor, Oasis

E. Operators: Front push bar or push bar on each side.
   1. Maximum Activation Force: 5 ft lbs.

F. Projector Clearance: Projector to back wall distance must be 12 inches or greater.

G. Fixture Hanger: Steel, designed to mount fixture to fixture support, as furnished by drinking fountain manufacturer. See Section 224200.

H. Selections: Refer to Contract Documents for Manufacturer and Model Number.

2.02 FASTENERS

A. Vandal Resistant Fasteners: Torx head with center pin.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install the Work of this section in accordance with the manufacturer's printed installation instructions.

B. Standard Fixture Mounting Height (unless otherwise indicated on the Drawings): Distance finished floor to rim.
   1. Adult Usage: 40 inches.
   2. Child Usage: 29 inches.

C. Handicapped Accessible Fixture Mounting Height: Maximum distance finished floor to spout outlet.
   1. Handicapped Accessible Usage: 36 inches.

3.02 CLEANING, FLUSHING AND ADJUSTMENT

A. Clean and polish fixture and trim.

B. Flush piping; clean strainers and trap.

C. Adjust for proper delivery.

END OF SECTION

APPENDIX D: MILESTONE SCHEDULE

THIELLS FD NEW 26-100 FIRE HEADQUARTERS

Construction Manager: The Palombo Group
Michael J. DeVogel (845) 907-3600

WBS	Task Name	Start	Finish	Duration
1	**PRECONSTRUCTION**	**Tue 25-Feb-25**	**Tue 22-Jul-25**	**106**
1.1	Bidding	Tue 25-Feb-25	Tue 01-Apr-25	26
1.2	Contractor Qualifications & Recommendations	Tue 01-Apr-25	Mon 21-Apr-25	15
1.3	Notice of Intent to Award	Tue 22-Apr-25	Tue 22-Apr-25	1
1.4	Front End Submittals (Bonds, Insurance, Schedules, etc.)	Wed 23-Apr-25	Tue 13-May-25	15
1.5	EC Long Lead Items (Switchgear/Panels etc.)	Wed 23-Apr-25	Tue 06-May-25	10
1.6	PC Long Lead Items (Sprinkler System, Fuel Tank, OWS))	Wed 23-Apr-25	Tue 29-Apr-25	5
1.7	MC Long Lead Items (HVAC Equipment)	Wed 23-Apr-25	Tue 06-May-25	10
1.8	GC Critical Submittals (Structural Steel & Framing/Windows/Ext Doors/Roofing etc.)	Wed 23-Apr-25	Tue 06-May-25	10
1.9	ALL Remaining Submittals	Wed 30-Apr-25	Tue 22-Jul-25	60
2	**BUILDING CONSTRUCTION**	**Mon 02-Jun-25**	**Fri 04-Sep-26**	**330**
2.1	*Winter Conditions & Temporary Heat by General Construction Work	Tue 18-Nov-25	Mon 13-Apr-26	105
2.2	**Building Erection & Weather Tight**	**Mon 02-Jun-25**	**Mon 01-Dec-25**	**131**
2.2.1	Existing Underground Utility Mark Out	Mon 02-Jun-25	Mon 02-Jun-25	1
2.2.2	Tree Removals in Building Footprint	Tue 03-Jun-25	Sat 14-Jun-25	9
2.2.3	Site Demo & Removals in Building Footprint	Mon 16-Jun-25	Tue 17-Jun-25	2
2.2.4	Grading/Compaction/Testing in Building Footprint	Wed 18-Jun-25	Sat 21-Jun-25	3
2.2.5	Perimeter footings	Mon 23-Jun-25	Fri 11-Jul-25	15
2.2.6	Interior footings/underslab utiliites/pour slab	Mon 14-Jul-25	Fri 22-Aug-25	30
2.2.7	Pull forms/Layout steel	Mon 25-Aug-25	Fri 29-Aug-25	5
2.2.8	Structural Steel (Columns, Beams, Joists, Decking)	Mon 01-Sep-25	Fri 10-Oct-25	30
2.2.9	Exterior Wall Construction / Enclosure	Mon 13-Oct-25	Fri 31-Oct-25	15
2.2.10	Enclose Building (Windows & Doors, O/H Doors)	Mon 13-Oct-25	Fri 28-Nov-25	35
2.2.11	Install Roofing System (finish details may be @ later date)	Mon 27-Oct-25	Fri 28-Nov-25	25
2.2.12	**Milestone - Building Enclosed & Weathertight**	Mon 01-Dec-25	Mon 01-Dec-25	1
2.2.13	Pre -finish inspections	Mon 24-Nov-25	Mon 24-Nov-25	1
2.2.14	Exterior Wall Finish (coordinate w/ steel & roofing work)	Mon 01-Sep-25	Fri 31-Oct-25	45
2.3	**Building Interior**	**Tue 25-Nov-25**	**Fri 04-Sep-26**	**204**
2.3.1	MEP Rough In	Tue 25-Nov-25	Mon 16-Feb-26	60
2.3.2	Concrete Equipment Pads, Heated Enclosure	Tue 25-Nov-25	Fri 05-Dec-25	9
2.3.3	Interior Framing (Walls & Ceilings)	Tue 25-Nov-25	Mon 05-Jan-26	30
2.3.4	Drywall (Walls & Ceilings)	Tue 06-Jan-26	Fri 20-Feb-26	34
2.3.5	Tape and Polish (Walls & Ceilings)	Tue 20-Jan-26	Fri 06-Feb-26	14
2.3.6	*Partition MEP Rough In Inspection	Tue 03-Feb-26	Tue 03-Feb-26	1
2.3.7	Painting (Primer & Base Coat)	Mon 23-Feb-26	Fri 13-Mar-26	15
2.3.8	Ceramic Wall & Floor Tile	Tue 17-Feb-26	Mon 16-Mar-26	20
2.3.9	*Above Ceiling MEP Rough In Inspection	Mon 16-Mar-26	Mon 16-Mar-26	1
2.3.10	MEP Finish	Mon 16-Mar-26	Fri 08-May-26	40
2.3.11	Install Ceiling Grid system	Tue 17-Mar-26	Mon 13-Apr-26	20
2.3.12	Install Flooring and Floor Protection	Tue 14-Apr-26	Mon 04-May-26	15
2.3.13	Architectural Finishes	Tue 05-May-26	Thu 21-May-26	13
2.3.14	Doors and Hardware	Tue 14-Apr-26	Mon 11-May-26	20
2.3.15	Install Ceiling Tiles	Tue 28-Apr-26	Mon 11-May-26	10
2.3.16	Final Painting / Touch Up	Tue 12-May-26	Mon 18-May-26	5
2.3.17	System(s) Startup	Thu 30-Jul-26	Mon 17-Aug-26	13
2.3.18	Owner Training	Tue 18-Aug-26	Mon 24-Aug-26	5
2.3.19	Remove Protection & Final Cleaning	Tue 25-Aug-26	Thu 03-Sep-26	8

Milestone Schedule to serve as a guide for development of Contract Project Schedules and Contractor Master Schedule. The intent of this schedule is not to indicate all items, exact sequencing, durations of specific tasks or means and methods which should be detailed on Contractor Progress Schedules. All milestone dates shall be adhered to.

THIELLS FD NEW 26-100 FIRE HEADQUARTERS

Construction Manager: The Palombo Group
Michael J. DeVogel (845) 907-3600

WBS	Task Name	Start	Finish	Duration
2.3.20	**Milestone - Substantial Completion**	Fri 04-Sep-26	Fri 04-Sep-26	1
2.4	**Additional Critical Work Items**	**Tue 20-Jan-26**	**Wed 29-Jul-26**	**137**
2.4.1	Server Room Build Out (racks, cable trays, fire suppression - CLEAN)	Tue 20-Jan-26	Mon 02-Mar-26	30
2.4.2	Meters/Transformer	Tue 30-Jun-26	Mon 20-Jul-26	15
2.4.3	Install Switchgear & changeover from Temp to Final Electric	Tue 21-Jul-26	Wed 29-Jul-26	7
2.5	**Outside Building**	**Mon 16-Mar-26**	**Fri 07-Aug-26**	**105**
2.5.1	Underslab Utilities/Equip Pads/Blg Surround, Fueling Pads etc.	Mon 16-Mar-26	Fri 24-Apr-26	30
2.5.2	Wall Construction including finish	Mon 13-Apr-26	Fri 22-May-26	30
2.5.3	OWS Set Equipment & Connect	Mon 04-May-26	Fri 29-May-26	20
2.5.4	Fueling Station	Mon 01-Jun-26	Fri 03-Jul-26	25
2.5.5	Generator, System Start Up and Commissioning	Thu 30-Jul-26	Fri 07-Aug-26	7
2.5.6	**Milestone - Enclosure Substantial Completion**	Mon 06-Jul-26	Mon 06-Jul-26	1
3	**SITE WORK**	**Tue 27-May-25**	**Mon 24-Aug-26**	**325**
3.1	**Site Work 2025**	**Tue 27-May-25**	**Thu 30-Apr-26**	**243**
3.1.1	Preconstruction Meeting with D.E.C. (needed?)	Tue 27-May-25	Tue 27-May-25	1
3.1.2	Existing Underground Utility Mark Out and New Layout	Mon 02-Jun-25	Tue 03-Jun-25	2
3.1.3	Installation of Erosion Control System	Wed 04-Jun-25	Tue 10-Jun-25	5
3.1.4	Cut & Fill Excavation, Stockpile, Testing	Wed 11-Jun-25	Tue 01-Jul-25	15
3.1.5	Trenching Excavation, Stockpile, Testing	Wed 02-Jul-25	Tue 08-Jul-25	5
3.1.6	Load Soil & Dispose Offsite	Wed 09-Jul-25	Tue 15-Jul-25	5
3.1.7	Site Demo / Removals	Wed 11-Jun-25	Tue 17-Jun-25	5
3.1.8	Prepare Staging Area & Site Security Fence	Wed 18-Jun-25	Fri 27-Jun-25	8
3.1.9	Tempoary Electric & Water	Mon 30-Jun-25	Fri 04-Jul-25	5
3.1.10	Underground Utilities	Wed 02-Jul-25	Tue 30-Sep-25	65
3.1.11	Site Drainage, Retention Sytem	Wed 01-Oct-25	Fri 24-Oct-25	18
3.1.12	General Site Grading	Mon 27-Oct-25	Fri 14-Nov-25	15
3.1.13	Final driveway/parking grading, binder and sub-base	Tue 14-Apr-26	Thu 30-Apr-26	13
3.2	**Site Work 2026**	**Mon 30-Mar-26**	**Fri 21-Aug-26**	**105**
3.2.1	Site Lighting/Camera Poles/Charging Stations	Mon 30-Mar-26	Fri 10-Apr-26	10
3.2.2	Hardscape: Walls, Curbs & Sidewalks	Mon 13-Apr-26	Fri 15-May-26	25
3.2.3	Final Grading and Landscaping	Mon 18-May-26	Tue 09-Jun-26	17
3.2.4	Dumpster Enclosure/Bollards	Wed 10-Jun-26	Fri 26-Jun-26	13
3.2.5	Concrete Apparatus Driveway	Mon 29-Jun-26	Wed 15-Jul-26	13
3.2.6	Top Course Paving and Line Striping	Thu 16-Jul-26	Fri 31-Jul-26	12
3.2.7	Site Finishes	Mon 03-Aug-26	Fri 07-Aug-26	5
3.2.8	Restoration of Staging Area	Mon 10-Aug-26	Fri 21-Aug-26	10
3.3	**Milestone - Sitework Substantial Completion**	Mon 24-Aug-26	Mon 24-Aug-26	1
4	**POST CONSTRUCTION**	**Tue 25-Aug-26**	**Thu 17-Dec-26**	**83**
4.1	Contractor Substantial Completion - Punchlist Issued	Tue 25-Aug-26	Tue 25-Aug-26	1
4.2	Contractor Punch List Work	Wed 26-Aug-26	Tue 06-Oct-26	30
4.3	Systems Commisioning (HVAC / Electrical)	Mon 07-Sep-26	Fri 02-Oct-26	20
4.4	Contractor Submission of Closeout Documents	Wed 07-Oct-26	Wed 04-Nov-26	21
4.5	Review and Resolution of Open Closeout Documents and Open Punchlist	Thu 05-Nov-26	Wed 16-Dec-26	30
4.6	**Final Completion**	**Thu 17-Dec-26**	**Thu 17-Dec-26**	1
5	**TECHNICAL SYSTEMS**	**Mon 03-Aug-26**	**Fri 09-Oct-26**	**50**
5.1	Server Room - Owner Equipment Installation & Commisioning	Mon 03-Aug-26	Fri 02-Oct-26	45
5.2	Camera and Card Access Security System Programming and Commissioning	Mon 03-Aug-26	Fri 28-Aug-26	20
5.3	Owner Furniture & Kitchen Equipment Installation	Mon 31-Aug-26	Fri 09-Oct-26	30
5.4	Audiovisual Equipment Installation	Mon 21-Sep-26	Fri 25-Sep-26	5
5.5	Audiovisual System Programming and Troubleshooting	Mon 28-Sep-26	Fri 02-Oct-26	5
5.6	**Milestone - Technical Systems Substantial Completion**	Fri 02-Oct-26	Fri 02-Oct-26	1

Type here to add a new task

Milestone Schedule to serve as a guide for development of Contract Project Schedules and Contractor Master Schedule. The intent of this schedule is not to indicate all items, exact sequencing, durations of specific tasks or means and methods which should be detailed on Contractor Progress Schedules. All milestone dates shall be adhered to.

REQUEST FOR SUBSTITUTION FORM

Project: TRFD2302 Thiells New Fire Headquarters

Substitution Request Number:_____

Contractor:_____

Address:_____

To:_____ Date:_____

H2M Project Number: TRFD2302

Owner: Thiells-Roseville Fire District (TRFD)

Contract Name:_____ Contract No.:_____

Specification Title: Metal Cladding

Section: 07 46 16 Page: 569-571 Article/Paragraph: 2.1 2.01

Drawing No(s).: A 200.00 - A 201.00

Proposed Substitution: AL 13 Architectural Systems

Manufacturer: AL13 Architectural System Address: 301-2219 Rimland Dr, Bellingham WA 98226

Trade Name:_____ Phone #: (855) 438-2513

Installer:_____ Address:_____

Phone #: (____)_____

History: ___New product ___2-5 years old ___5-10 years old ✓More than 10 years old

Differences between proposed substitution and specified product:

AL13 Plank has a nickle groove, the pla , are 12' in Size, and is a certified rainscreen system

___Point-by-point comparative data attached

Reason for not providing specified item (Attach separate sheet if necessary):

Typical Similar Installation:

Project: Meskwaki Nation Recreation Center

Engineer / Architect: ISG

Address: Tama, IA

Owner: Sac & Fox Tribe of the Mississippi

Date Installed: April 2023 complete

Submit complete installation list on separate sheets.

Proposed substitution affects other parts of Work: ✓No ___Yes

Explain:_____

Gross Savings to Owner for accepting substitution: $ TBD

Proposed substitution changes Contract Time: ✓No ___Yes

Add / deduct (circle):_____ days

Supporting data attached for evaluation of the proposed substitution:

✓Product Data ___Photos ___Drawings ___Tests ___Reports ✓Samples

___Other (explain):_____

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

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

The undersigned certifies that the following paragraphs, unless modified by attachments, are correct:

1. Proposed Substitution has been fully checked and coordinated with Contract Documents.
2. Proposed Substitution does not affect dimensions shown on Drawings.
3. Proposed Substitution does not require revisions to any other Prime Contractor's work.
4. The undersigned will pay for changes to building design, including Architectural and Engineering design, detailing, and construction costs caused by requested Substitution.
5. Proposed Substitution will have no adverse affect on other trades, construction schedule, or specified warranty requirements.
6. Maintenance and service parts will be locally available for proposed substitution.
7. The undersigned further states that the function, appearance, and quality of proposed Substitution are equivalent or superior to specified item.

This request for product substitution also constitutes a representation that I, as the Contractor:

1. Has investigated proposed Product and determined that it meets or exceeds the quality of the specified Product.
2. Shall provide the same warranty for the Substitution as for the specified Product.
3. Shall coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner, including extra charges by other Prime Contractors, material suppliers, and vendors.
4. Waives claims for additional costs or time extension that may subsequently become apparent.
5. Shall reimburse the Owner and the Architect/Engineer for review or redesign services associated with re-approval by authorities.
6. Shall reimburse the Owner for all additional engineering services claimed by the Architect/Engineer for extra services associated with the review of the Contractor's substituted item since it could not have been originally included in the Architect/Engineer's professional engineering services agreement. Reimbursement shall be based on the man-hours expended, at current billing rates.

Contractor's Authorized Representative (Typewritten):_____

Authorized Signature:_____

Date:_____

END OF SECTION

AL13 architectural systems®

plank® system

SPECIFICATIONS
COLORS & WOODGRAINS
PRODUCT DESCRIPTIONS

TECHNICAL DATA
CLEANING & MAINTENANCE
INTALLATION GUIDE

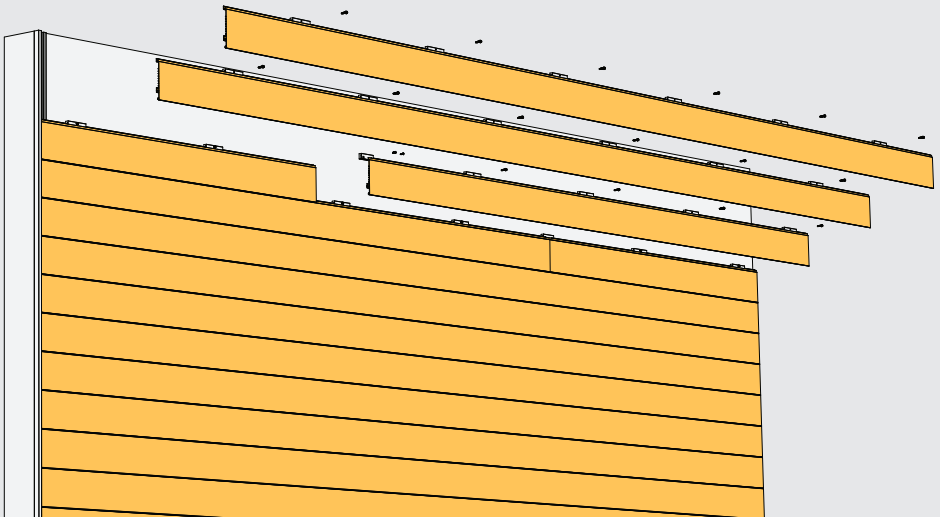
WARRANTY INFORMATION
REQUEST SAMPLES

HEADQUARTERS
1278 CLIVEDEN AVENUE DELTA,
BC. CANADA V3M 6G4

+1 855 438 2513
+1 604 428 2513
INFO@AL13.COM

plank system

Get the look of wood, with the durability of metal.



Fire Safety 1

AL13 is made of solid non-combustible aluminum extrusions.

CAN/ULC-S114 - non-combustible

ASTM E136 - passed

CAN/ULC-S102 - flame spread (0) - smoke development (0)

ASTM E84 - flame spread (0) - smoke development (0)

Wind + Water 2

AL13 Planks are cut to fit on-site, secured using system clips and system frame components, allowing for on-the-fly changes. AL13 system clips and extrusions work together to create a secure system with built-in moisture management.

AAMA 508 - pressure equalized rainscreen

ASTM E330 - windload

Intertek evaluated for Canadian NBC part 9 & Part 5 CCMC equivalency

Finish 3

Our system comes in 6 wood grains. Custom color matching also available.

AAMA 2604 - coating finish standard

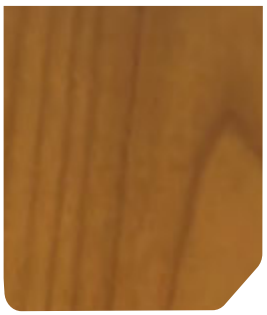
15 year finish warranty

longboard has 15 & 20 year - we only requested 15 in our spec

woodgrains

douglas fir
v-1501/02

maple
v-1101/02



light european cherry
v-1406/01

oak
v-2503/04

cherry
v-1402/02

italian rosewood
v-1815/09

CLICK HERE TO REQUEST SAMPLES
www.AL13.com/samples

PRODUCT DESCRIPTION

PRODUCT FEATURES
USA

- DESCRIPTION
  - Aluminum architectural cladding with high performance fluorocarbon coating finish or powder coated woodgrain finishes (Plank System).
- USES
  - Designed for cladding applications to provide a complete rain screen wall system.
- PRODUCT ATTRIBUTES AND CHARACTERISTICS
  - High performance fluorocarbon finish coating is available in a variety of standard colors including solid colors, wood line and metallic finishes. Custom colors are also available.
  - High performance powder coated woodgrain finish available in a variety of colors and patterns.
  - Extruded aluminum cladding.
  - Cladding dimensions and configurations allow for field adjustment and thermal movement.
- SELECTION CRITERIA
  - Attachment system allows for thermal movement due to thermal changes. The product should not be installed where surface temperatures are anticipated to exceed 180° F (82° C).
- SUSTAINABILITY CRITERIA
  - Contains recycled content and can contribute to LEED Material and Resources Credit 4 – Recycled Content.
- APPLICABLE CURRENT STANDARDS, RELATED REFERENCES
  - AAMA 508, Voluntary Test Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems.
  - ASTM B117 – Standard Practice for Operating Salt Spray (Fog) Apparatus.
  - ASTM D523 – Standard Test Method for Specular Gloss.
  - ASTM D714 – Standard Test Method for Evaluating Degree of Blistering of Paints.
  - ASTM D968 – Standard Test Method for Abrasion Resistance of Organic Coatings by Falling Abrasive.
  - ASTM D1308 - Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes.
  - ASTM D2244 – Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.

PRODUCT DESCRIPTION

- ASTM D2248 – Standard Practice for Detergent Resistance of Organic Finishes.
- ASTM D2794 – Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
- ASTM D3359 – Standard Test Methods for Rating Adhesion by Tape Test.
- ASTM D3363 – Standard Test Method for Film Hardness by Pencil Test.
- ASTM D4145 – Standard Test Method for Coating Flexibility of Pre-painted Steel.
- ASTM D4214 – Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films.
- ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials.
- ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C.
- ASTM E330 – Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- ASTM F1667 - Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.
- DAF-45, Aluminum Association Inc. Designation System for Aluminum Finishes.

- PERFORMANCE CRITERIA
  - General Cladding Properties:
    - Fire Propagation - ASTM E84
      - Flame Spread Index – ASTM E84: 0
      - Smoke Developed Index – ASTM E84: 0
    - Combustibility – ASTM E136 Option A: passed
    - Pressure Equalization – AAMA 508: Pass
    - Static Water Penetration (15 psf) – AAMA 508: Pass
    - Dynamic Water Penetration – AAMA 508: Pass
    - Structural Loading – AAMA 508: Pass; Design Pressure = 80 psf
    - Wind Loading- ASTM E 330: See Technical Data Sheet

- PACKAGING, HANDLING, PROTECTION, AND DELIVERY INSTRUCTIONS
  - Deliver materials and components in manufacturers' unopened containers or bundles, fully identified by name, brand, type and grade. Prevent damage during unloading, storing and installation.
  - Store, protect and handle materials and components to prevent twisting, bending, mechanical damage, contamination and deterioration.
  - Store materials off ground and keep clean, dry, and free of dirt and other foreign matter.

- SPECIAL WARRANTY

PRODUCT DESCRIPTION

- Fifteen year limited product warranty against physical defects of system components and products that are installed in compliance with published installation instructions and maintained according to the manufacturer's published guidelines.
- Powder Coated Woodgrains: Fifteen year limited finish warranty stating finishes shall be free from workmanship and material defects and free from fading, gloss retention, peeling, chipping, cracking or blistering of finish.

- LIMITATIONS
  - THE LIMITED WARRANTIES ARE SUBJECT TO THE FOLLOWING GENERAL PROVISIONS AND LIMITATIONS:
    - The limited warranties are effective only if there is proper storage, handling, installation and maintenance of the product in strict accordance with published instructions.
    - Claims must be made in writing to AL13®'s Product Performance Department within 30 days of the discovery of a problem and authorization obtained prior to beginning any repair or replacement work.
    - The Product Performance Department must be provided a reasonable opportunity to inspect and verify a claim.
    - AL13® shall have no liability for defects or damage resulting from:
      - Misuse or abuse;
      - Improper installation, including, but not limited to inadequate attachment and/or protection against all external damage;
      - Performance of coating other than those covered by the limited warranties;
      - Contact with harmful chemicals, fumes, or vapors;
      - Settlement, shrinkage or distortion of the structure; or
      - Fire, wind, flood, lightning, Acts of God, or other causes beyond the control and performance testing provided by AL13®.
    - AL13® shall have no liability for the cost of removing affected products.
  - Warranty for powder coated woodgrain coating is limited to 10 years in coastal areas within three miles of bodies of salt water and under the following condition:
    - Normal atmospheric conditions exclude corrosive or aggressive atmospheres such as those contaminated with chemical fumes, salt or other corrosive elements, including areas within 1,000 feet (305 meters) of a body of salt water.
  - Aluminum cladding must be separated from direct contact with dissimilar metals with an approved separation coating or layer.

PRODUCT DESCRIPTION

- SAFETY PRECAUTIONS
  - State safety concerns of product itself – or handling or installation precautions.
- AVAILABILITY
  - Available from appointed distributors. See distributor listing on website.
- COST
  - Consult distributors for specific product costs or relative costs.

PRODUCT PROPERTIES

- MATERIALS, COMPOSITION, PROPERTIES
  - Aluminum Extrusions: 6063 T5 aluminum alloy.
- ACCESSORIES
  - Fasteners for System Clips:
    - Attachment of System via Clip to Steel Substrate: #12-14 x 1 ½ inch (38 mm) drill-point fasteners with EPDM composite washers and corrosion-resistant coating. Installed every 32 inches (81.28 cm) on center.
    - Attachment of System via Clip to Wood Substrate: #12-14 x 1 ¾ inch (44.45 mm) mini drill-point fasteners with EPDM composite washers and corrosion-resistant coating. Installed every 32 inches (81.28 cm) on center.
    - Fastener Corrosion Resistance:
      - Carbon Steel: Coated to provide not less than 1,700 hours of ASTM B 117 salt spray performance with no white or red rust; 18 cycles of ASTM G 87 (DIN 50018) SO^2 Kesternich testing with not more than 15 percent red rust.
  - Fasteners for Frame Components:
    - Attachment of System frame components to Steel Substrate: #10-16 x ¾ inch (19.05 mm) self-drilling screws with corrosion-resistant coating. Installed every 24 inches (60.96 cm) on center.
    - Attachment of System frame components to Wood Substrate: #12-14 x 1 ½ inch (38 mm) mini drill-point fasteners with EPDM composite washers and corrosion-resistant coating. Installed every 16 inches (40.64 cm) on center, unless securing a segmented (3 ¼ inch) (8.25 cm) backplate (installed 16 inches (40.64 cm) on center), in which case two fasteners per segmented piece are required.
    - Fastener Corrosion Resistance:

PRODUCT DESCRIPTION

- □ Carbon Steel: Coated to provide not less than 1,700 hours of ASTM B 117 salt spray performance with no white or red rust; 18 cycles of ASTM G 87 (DIN 50018) SO^2 Kesternich testing with not more than 15 percent red rust.

- SHAPE, MASS, AND DIMENSION
  - Cladding Weight: 1.35 lb/ft^2 (6.59 kg/m^2)
  - Profile: Solid or Woodgrain Pattern (See finishes for additional information.)
  - Standard cladding size of 144 inch x 4 or 6 inch (3658 mm x 100 or 152 mm)
- FINISH, COLORS AND TEXTURES
  - Powder coated woodgrain finish in compliance with AAMA 2604.

PRODUCT INSTALLATION

- PREPARATION
  - Ensure structural supports are aligned and meets structural requirements for wind loading and gravity loads.
  - Ensure building surfaces are smooth, clean, dry and free from defects detrimental to installation of cladding system.
  - Ensure framing is planar with variations on not more than ¼-inch in ten feet.
  - Inspect cladding and components before installation and verify that there is no shipping, storage, or staging damage. Do not install damaged cladding. Remove from jobsite to avoid re-application.
  - Ensure all products received are as ordered/required for project, including finish and size.
- INSTALLATION
  - Install products in accordance with manufacturer's published handling and installation instructions.
  - Erect components plumb and true.
  - Adjust assembly to secure cladding safely to wall while allowing for calculated expansion and contraction of components. Ensure extrusion tabs overlap cladding edges by at least half of extrusion tab depth.
  - Do not cut, trim, weld, or braze component parts during erection in manner which would damage finish, decrease strength, or result in visual imperfection or failure in performance.
  - Apply isolation coating to areas of contact between dissimilar metals.

PRODUCT DESCRIPTION

Corporate Identification

AL13 Architectural Systems®

Toll Free Number	+ 855.438.2513
General E-mail	info@al13.com
Order Support	orders@al13.com
Website	http://www.AL13.com/

Technical Services Available:

Phone or e-mail for technical services. Check website for technical support.

Classification and Filing:

MasterFormat:

07 42 13 – Extruded & Coated Aluminum

AL13 architectural systems®

AL13 Cleaning & Maintenance

AL13 architectural systems

01

Cleaning & Maintenance

Dirt and other deposits may naturally accumulate due to specific environmental conditions. These build ups and deposits take away from the original aesthetic properties. AL13® recommends implementing a regular cleaning program to maintain the best possible appearance.

General cleaning:

- Surfaces may be cleaned with water using a soft brush or sponge free of debris. Avoid excessive rubbing.
- If necessary, surfaces may be cleaned with a mild detergent (pH 6 7) or cleaning agent diluted 1:50 parts water.
    - Some cleaning products may damage the finish. Using highly acidic or alkaline cleaning agents may corrode the aluminium and paint. If unsure, complete a small test area in an inconspicuous location before proceeding. If the solution results in any irregularities to the finish, discontinue use immediately. Always use all recommended safety precautions including appropriate skin and eye protection to prevent irritations or burns.
- After cleaning occurs, surfaces should be rinsed with clean water to remove any residue that might be present.
- To reduce the appearance of water spots or streaking, surfaces should be squeegeed or wiped dry with a clean cloth before the water is allowed to do so naturally. Surfaces heated by the sun will dry more quickly.

02

Do Not

- Do not clean AL13® using steel wool or abrasive pads.
- Do not clean AL13® with Acetone, paint thinners or removers.
- Do not clean AL13® with highly acidic or alkaline solutions.
- Do not clean AL13® with a pressure washer.

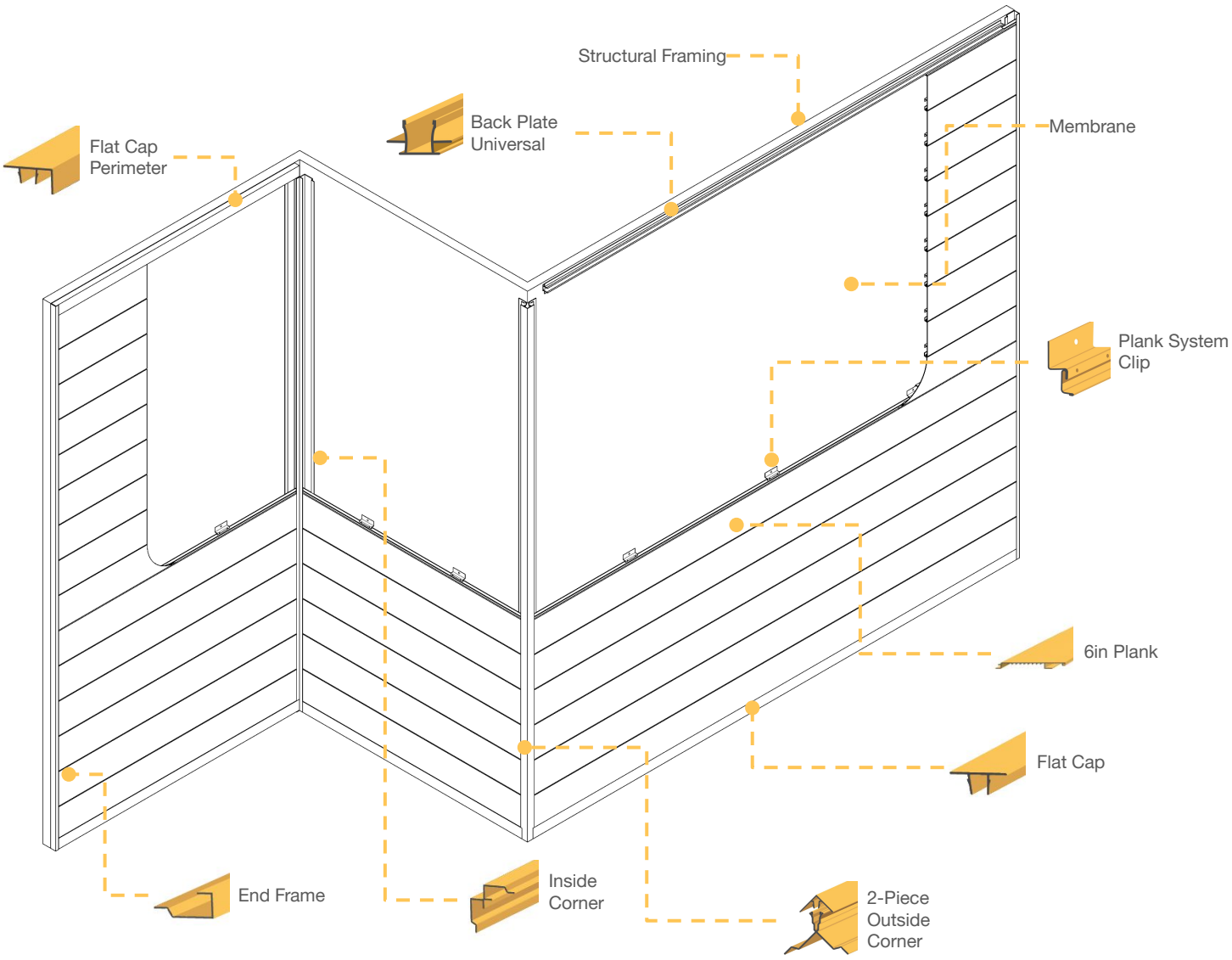
Installation Guide

AL13 architectural systems

Version: 2021 Apr 05

AL13 How-To

AL13 Plank System



The backplates and various caps use an interference fit and require an impact to engage the two components.

Note: Ensure that the substrate is solid enough or supported enough to sustain this impact.

01

Installation Guidelines 1

IMPORTANT: Failure to follow the guidelines herein will void the AL13® warranty

Please read and understand the entirety of this guide. Any questions or inconsistencies should be directed to your sales representative or info@al13.com.

Guidelines may vary depending on project particulars and conditions. Contact AL13® with questions regarding variance from this guide. Standard carpentry skills are required for optimum results.

Good health and safety practices must be followed when installing AL13® Plank System.
Please refer to the AL13® Material Safety Data Sheets for more info.

Key steps for a successful installation

01 Understand the various elements of the system
02 Plan the installation, work schedule, and material usage
03 Ensure everyone working has read the installation guidelines
04 Execute work in the sequence set forth in the installation guidelines
05 Protection should be worn: gloves, ear protection, steel-toe boots, safety glasses and hard hat
06 Protect the product by storing the material in a dry and clean environment
07 Ensure proper fit of the system
08 Clean any debris on the wall

Pre-installation: Receiving materials

When materials arrive on site, ensure that all planks, extrusions and other component packaging are in good condition, free of any defects, and verify that the materials match the order / shop drawings.

> Shipping or packaging issues should be noted on the waybill and then reported to the distributor

> Should any products be damaged, the receiving party is responsible for filling a freight claim to the shipping company within 24 hours of receiving product.

> Defective materials should be reported to the distributor from which the product was dispatched.

01

Installation Guidelines 2

Product Legend

The following are the various components of the system. Please refer to the following to verify the correct component.

Component	Size / piece	Material
 6” Plank	12’ length	AAMA 2604 coated aluminum extrusion
 4” Plank	12’ length	AAMA 2604 coated aluminum extrusion
 2” Plank Perforated Vent Strip	12’ length	AAMA 2604 coated aluminum extrusion
 End Frame	12’ length	AAMA 2604 coated aluminum extrusion
 Inside Corner	12’ length	AAMA 2604 coated aluminum extrusion
 Outside Corner	12’ length	AAMA 2604 coated aluminum extrusion
 Flat Cap	12’ length	AAMA 2604 coated aluminum extrusion
 Flat Cap: Perimeter	12’ length	AAMA 2604 coated aluminum extrusion
 Reveal Cap	12’ length	AAMA 2604 coated aluminum extrusion
 Reveal Cap: Perimeter	12’ length	AAMA 2604 coated aluminum extrusion

01

Installation Guidelines 3

Product Legend

Component	Size / piece	Material
 Two Piece Outside Corner	12’ length	*Outside Corner Cap*: AAMA 2605 coated aluminum extrusion *Backplate:* PVDF coated aluminum extrusion
 Back Plate: Universal	8’ length	Black powder coated aluminum extrusion
 System Clip: Compressible	100/package	Glass-filled polyamide
 System Clip: Plank / Joint Clip	100/package	Galvanized Steel
 Joint screws	100/package 1/2in long	Used to fasten two adjoining planks with System Clip: Plank
 Wood Fastener	500/package 1-1/2in long	Wood Substrate: #12-14 x 1 ½” mini drill-point fasteners with EPDM washers and corrosion-resistant coating
 Concrete Fastener	100/package 1-1/4in long	Concrete walls: #11 x 1 ¼” concrete screw anchor with corrosion-resistant coating
 Metal Fastener	500/package 3/4in long	Steel substrate: #10-16 x ¾” self-drilling, self-tapping screws with corrosion resistant coating

01

Installation Guidelines 4

Product Legend

Install Kit Components		Size / piece	Material
	80T Non-ferrous Saw Blade	10” - each	Carbide tip / high-speed steel
	60T Non-ferrous Saw Blade	6-¼” - each	Carbide tip / high-speed steel
	Gloves	pair	Rubber / lyca
	SLED: Flat	each	Plastic and rubber
	SLED: Reveal	each	Plastic and rubber
	SLED: Corner	each	Plastic and rubber

01

Installation Guidelines 5

Inventory

Once material is verified to be in good condition, take inventory of units according to the packing slip. Make sure all materials - plank, extrusions, and fasteners - and quantities are present.

The distributor should be notified immediately if the order has any missing or incomplete components. Failure to do so may void re-fulfillment.

Tools

The AL13® Plank System is made to be installed with general tools. A recommended tool list is as follows:

> Sawhorses/work table
> Circular saw (handheld with guide)
> Table saw
> Mitre saw
> Cordless electric impact driver with appropriate bits
> AL13® saw blades
> AL13® SLED tools
> Jigsaw
> Level/plumb line
> Chalk line
> Cordless electric drill
> Drill bit set

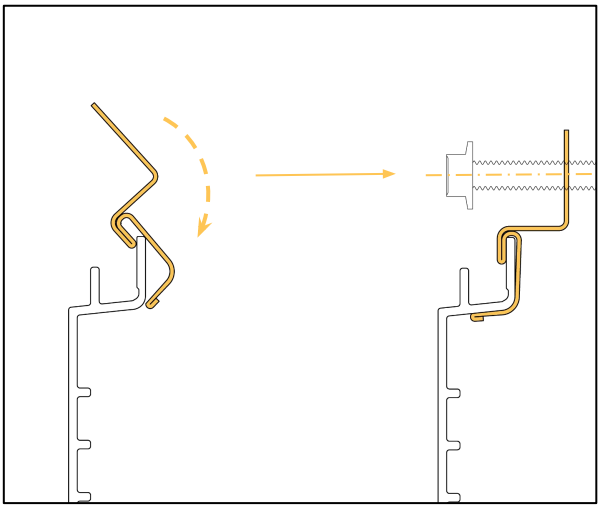
01

Installation Guidelines 6

Plank System Clip

The Plank System Clip provides an interface between the plank and the substrate and is secured to the wall using an AL13®-approved fastener appropriate for the substrate (see section on supported substrates for further information). Familiarize yourself with installing the Plank System Clip correctly to achieve the correct fit.

Correct Installation

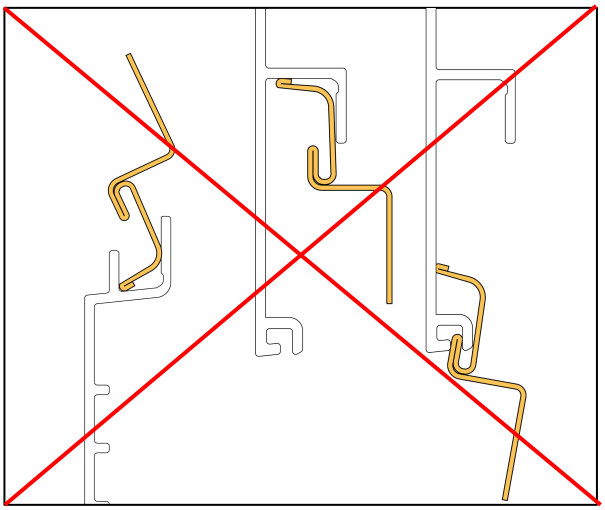


Install the Plank System Clip correctly as shown by engaging the inner top flange of the plank. Gently rotate the Plank System Clip to secure it in place.

Put the appropriate fastener through the mounting hole to mount the secure the clip.

Note: The clip can be moved easily along the length of the plank after it has been engaged.

Incorrect Installation



Note: The Plank System Clip only engages in one position correctly.

If the Plank System Clip is inserted incorrectly, it will not securely attach the plank on to the substrate. Installation of the subsequent planks can not be done correctly.

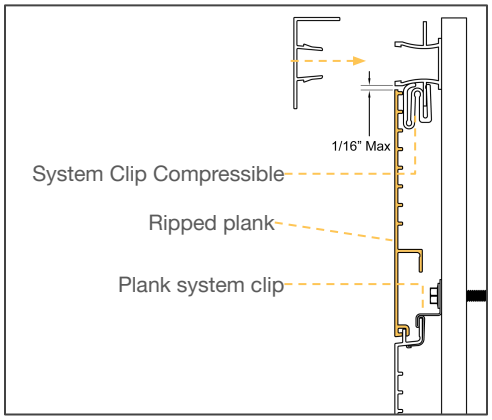
AL13 How-To

01

Installation Guidelines 7

Terminating the Plank Wall

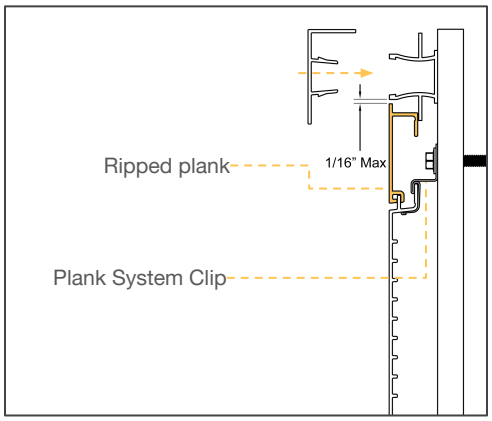
The Plank Wall is terminated towards the tongue side of the plank with a full width or a ripped section of plank. Below are guidelines typical for terminating the wall. Contact AL13® if you have further questions about terminating the wall.



RIPPING THE PLANK

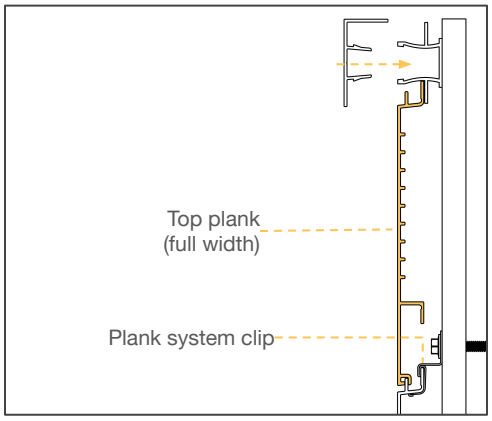
In most situations, the remaining width at the top of the wall requires the plank to be “ripped”to the correct width. In this case, leave a gap of 1/16” max from the back plate.

A System Clip Compressible can be attached to the back plate to support the ripped plank as shown.



RIPPING A NARROW STRIP

In situations that require a narrow strip of plank for the top of the wall, it may be necessary to snip the upper flange of the Plank system clip to ensure a flush fit.



FULL PLANK WIDTH

In rare situations, the remaining width at the top of the wall can be covered by a full plank width and no ripping is necessary.

Note: The end plank does not require a Plank System Clip.

AL13 How-To

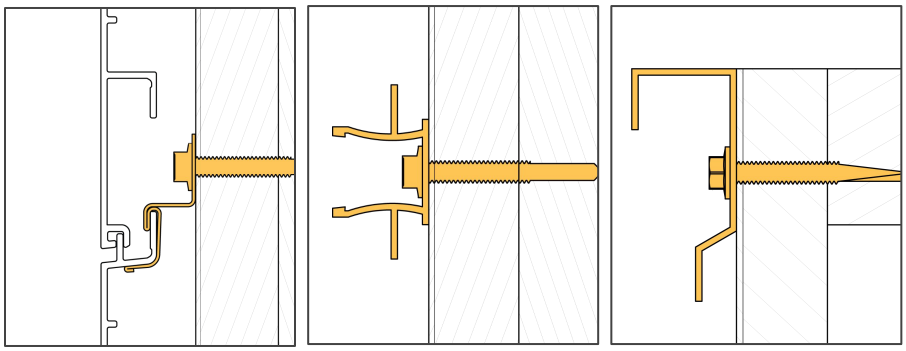
01

Installation Guidelines 8

Supported Substrates

Wood Frame with OSB/Plywood Sheathing

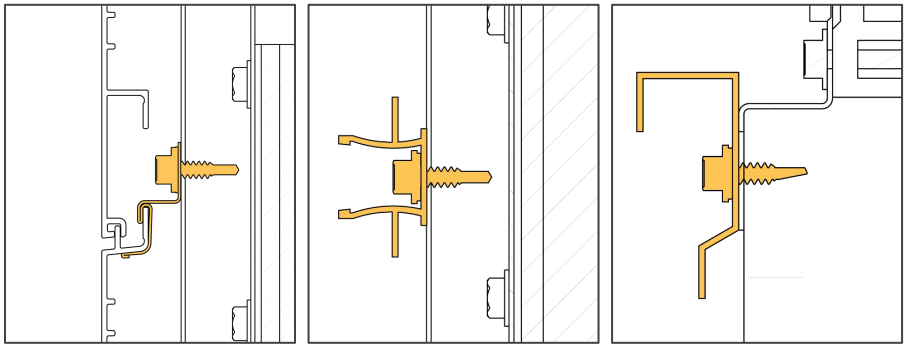
For installation on wood substrates, plywood, and OSB, AL13® Wood Fasteners must be used. For sheathed wood frame, AL13® installs directly on building wrap. The mechanical fasteners anchor into building sheathing and studs where available.



Wood Fastener
#12-14 x 1 ½”

Girt/Furring Bar Installation

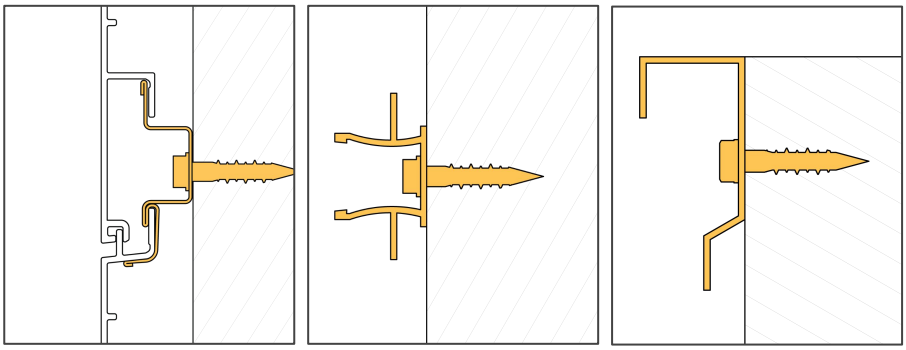
For installation on girt or furring bars, use metal fasteners.



Metal Fastener
#10-16 x ¾”

Concrete Installation

For installation on concrete, use concrete fasteners/anchors.



Concrete Fastener
#11 x 1 ¼”

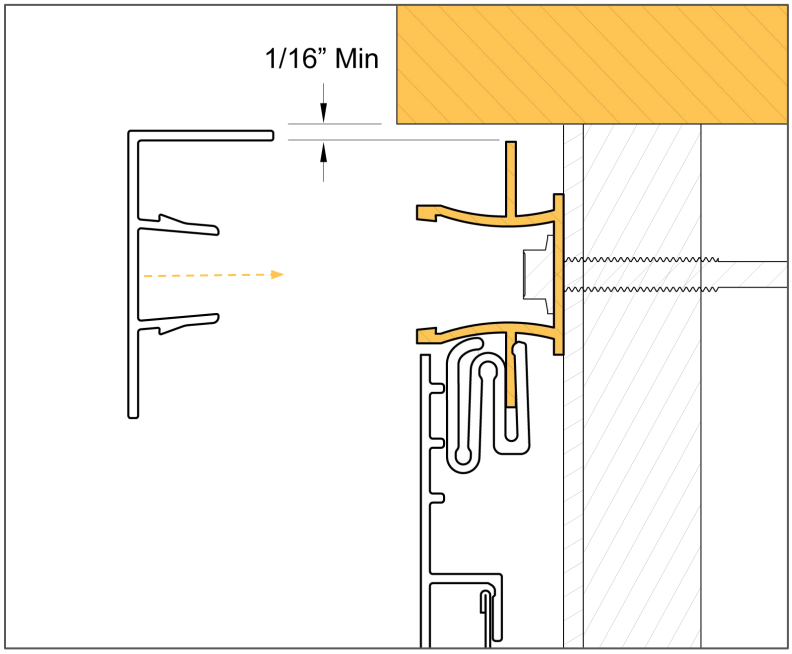
AL13 How-To

01

Installation Guidelines 9

Installation near Windows, Doors, and other Bump-Outs

When installing around a perimeter terminated with a Back Plate Universal, leave a minimum gap of 1/16” from the edge of the Back Plate to the perimeter border. This allows sufficient space for a top cap to be installed.



Leave a minimum of 1/16” gap between the edge of a perimeter (e.g., windows, doors, bump-outs) and the Back Plate Universal.

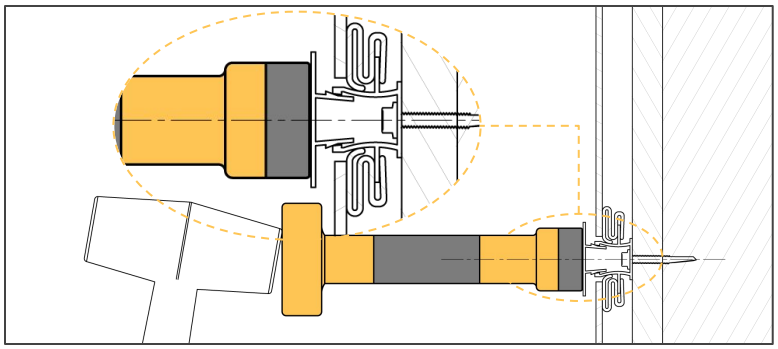
01

Installation Guidelines 10

Installing the Top Caps

Panels are fastened by the frame tabs on the top caps around the entire perimeter. No traditional mechanical fasteners are required in the panel itself.

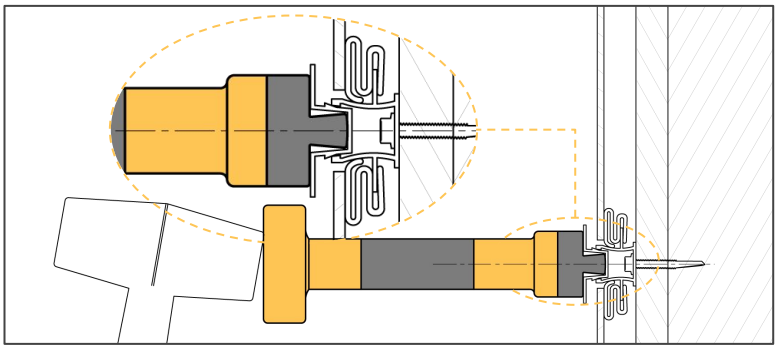
Ensure that the correct Snap-Lock Engagement Device (SLED) is used for the appropriate cap. Use a rubber mallet together with the appropriate SLED to install the top caps.



Flat Cap  and

Flat Cap: Perimeter 

require the  Flat SLED

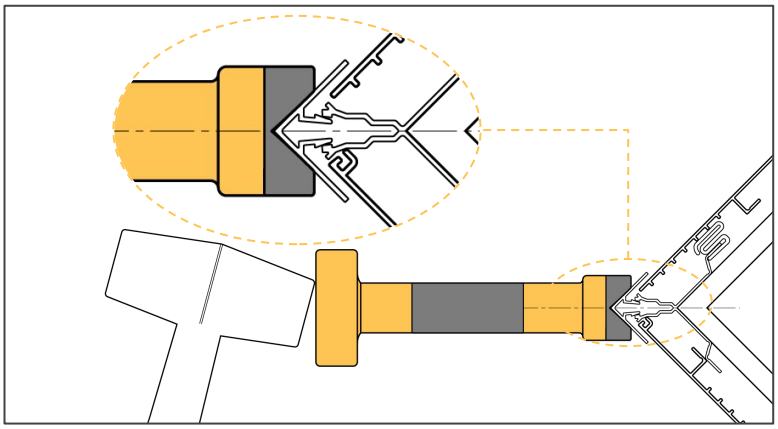


Reveal Cap  and

Reveal Cap: Perimeter 

require the  Reveal SLED

A protrusion at the bottom of the SLED fits inside the reveal of the cap to ensure proper installation.



2-Piece Outside Corner Cap 

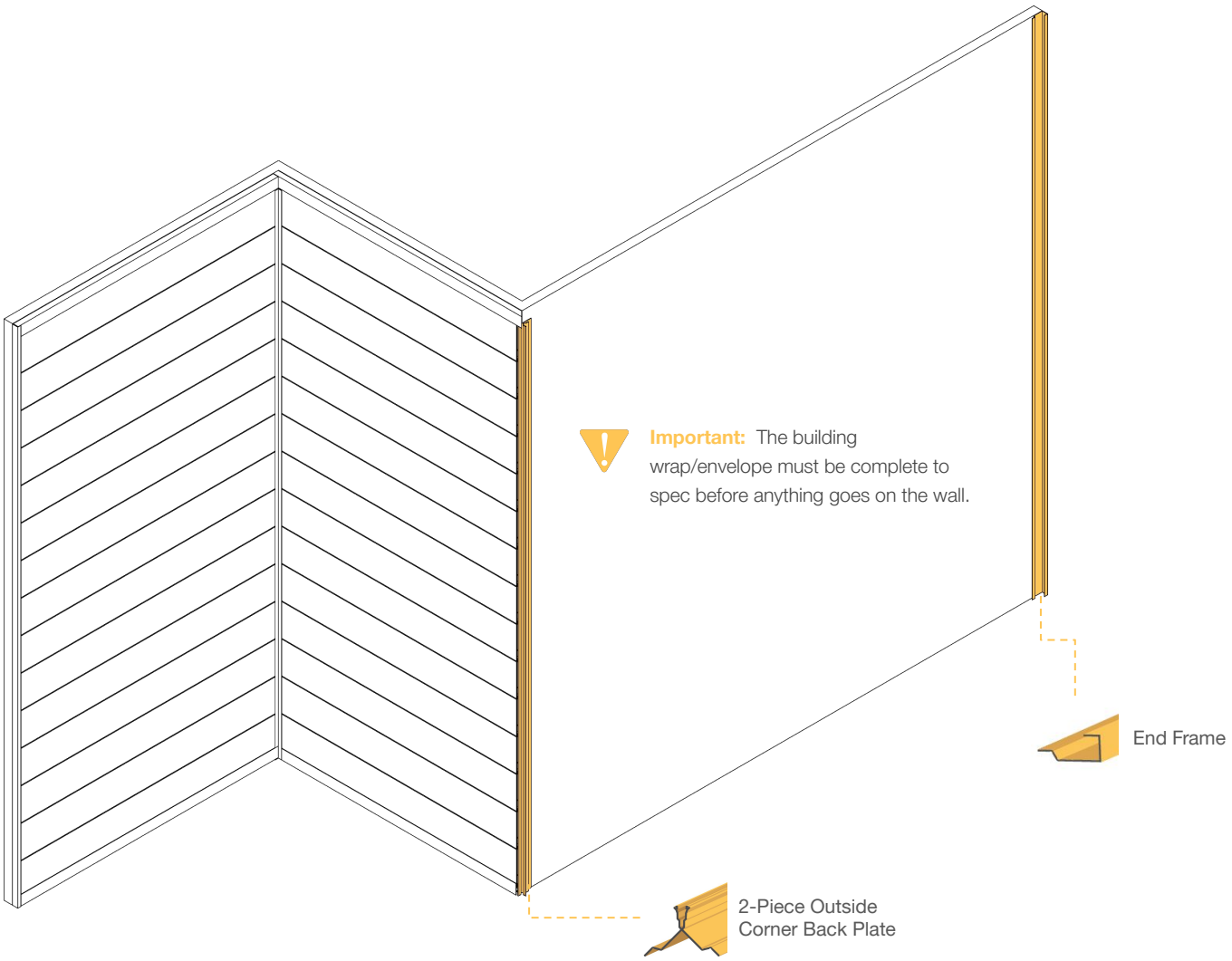
requires the  2OC SLED

A cutout at the bottom of the SLED captures the geometry of the Outside Corner cap to ensure proper installation.

02

Plank Install 01

Fasten vertical perimeter extrusions



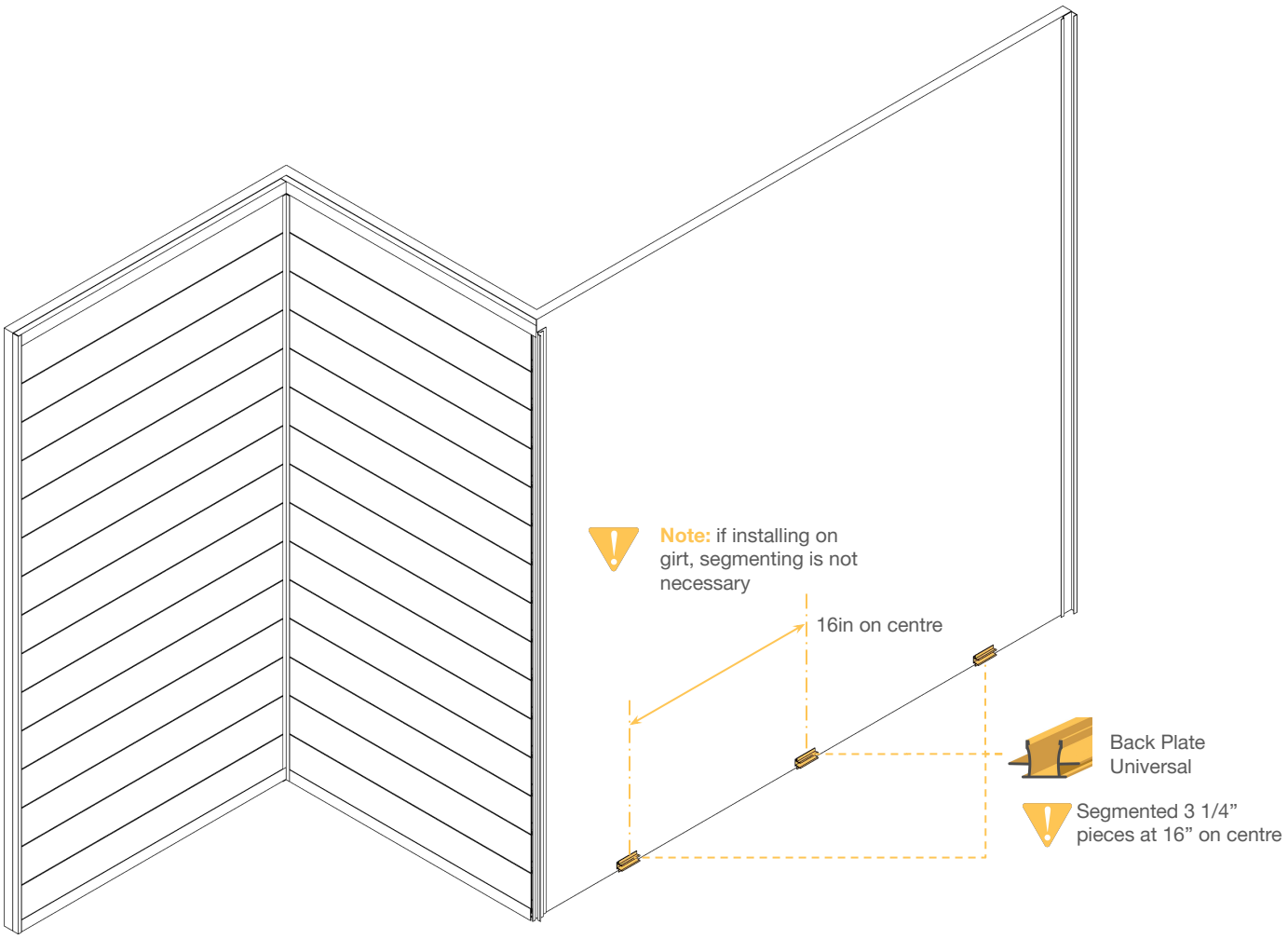
The vertical perimeter extrusions are normally the first extrusions to be fixed to the wall. Layout end frame extrusions according to the desired location. Ensure frames are level and plumb before fastening.

Workflow is always from the bottom up. Place the first fastener near the bottom of the vertical extrusion. Once the piece has been leveled, add a second near the top fixing it in place and add subsequent fasteners.

02

Plank Install 02

Fasten horizontal baseline extrusions



Segment the Back Plate Universal by cutting to lengths of 3 1/4" and install every 16" on centre to serve as the baseline. This will establish the horizontal datum and will be a reference to subsequent extrusions.

It is important that it is mounted level.

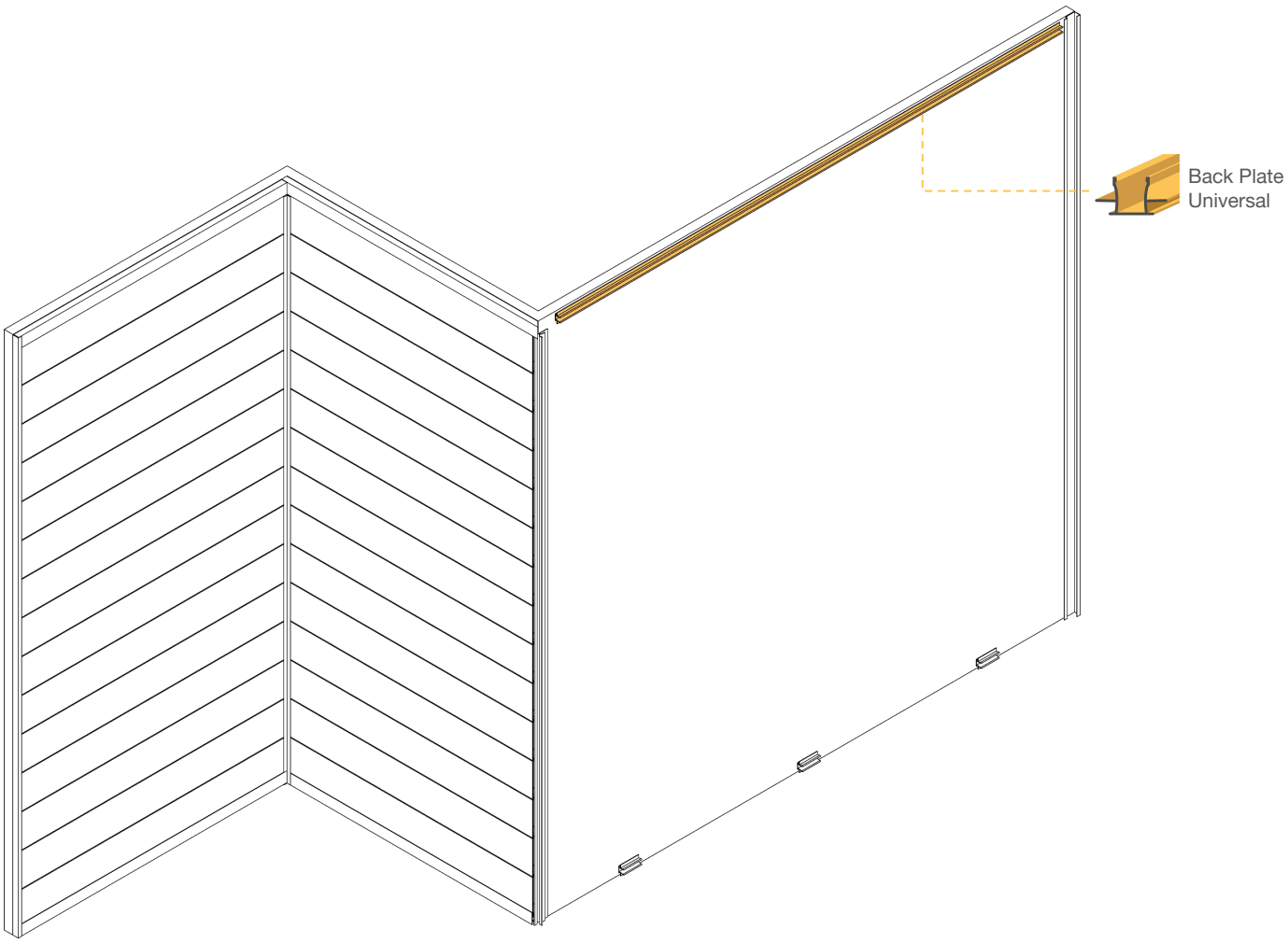
Note: In some installations, more than a full length of a top cap may be required. In this case, ensure that the seam is supported adequately by a back plate.

AL13 How-To

02

Plank Install 03

Fasten horizontal upper extrusions.



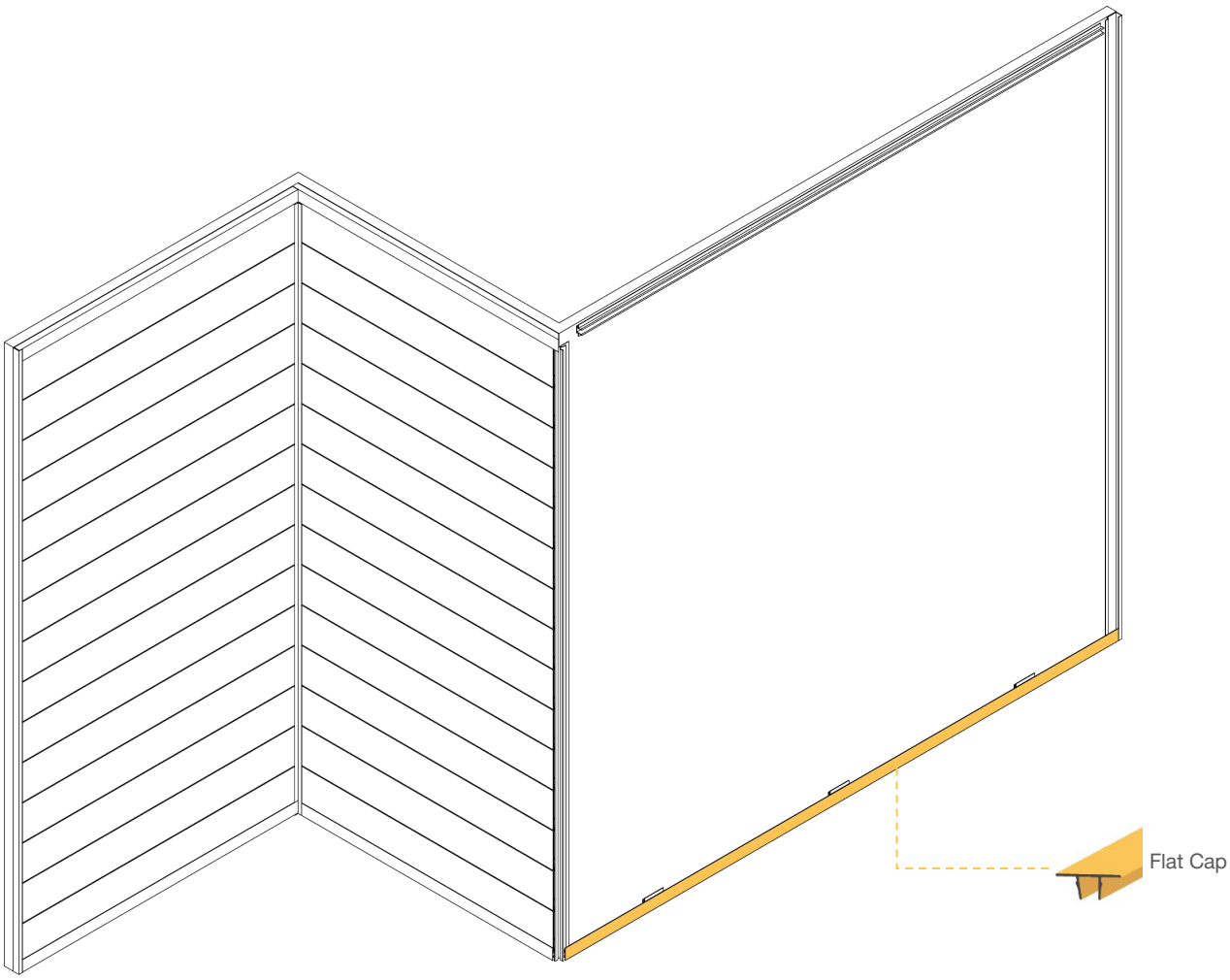
The final perimeter extrusion to be attached is the upper horizontal back plate.

Leave a gap of 1/16” from the top edge to the edge of the back plate to ensure fit of a top cap. See Installation Guideline section for details (p11).

02

Plank Install 04

Engage baseline flat cap.



The flat cap needs to be cut to size and engaged using an AL13® SLED before the first row of plank is installed. A properly fit cap should tuck under both verticals, leaving approximately a 1/16” gap on either side to allow for thermal contraction and expansion. If a butt joint is required due to the length of the flat cap exceeding 12’, the butt joint must occur on a shared back plate segment.

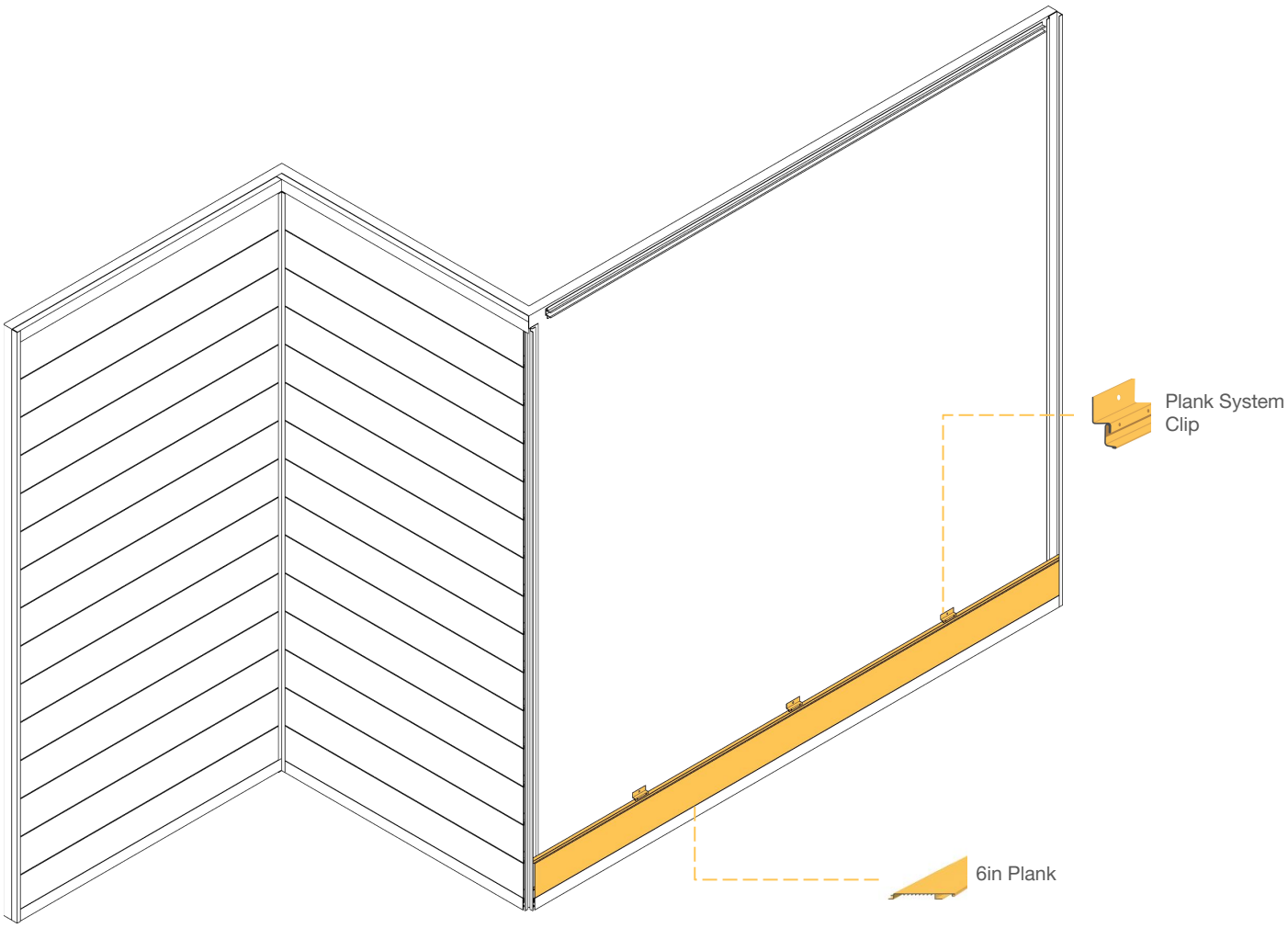
Engage the flat cap only where the back plate is present. Impacting the flat cap in the voids, i.e., between the back plates, will cause deformation of the flat cap.

AL13 How-To

02

Plank Install 05

Installing the planks.



A properly-cut plank should have a ⅛" gap from the frame components on either side to allow for thermal expansion.

It is essential the first row of plank be tucked behind the vertical tab of the frame components so that the fastening tongue is pointed upwards and the groove is pointing downwards.

Once the plank has been fitted and leveled to an even plane, it will be secured by attaching an AL13® Plank System Clip to the upwards pointing tongue. Make sure the clip is fully inserted before adding fastener to the through-hole.

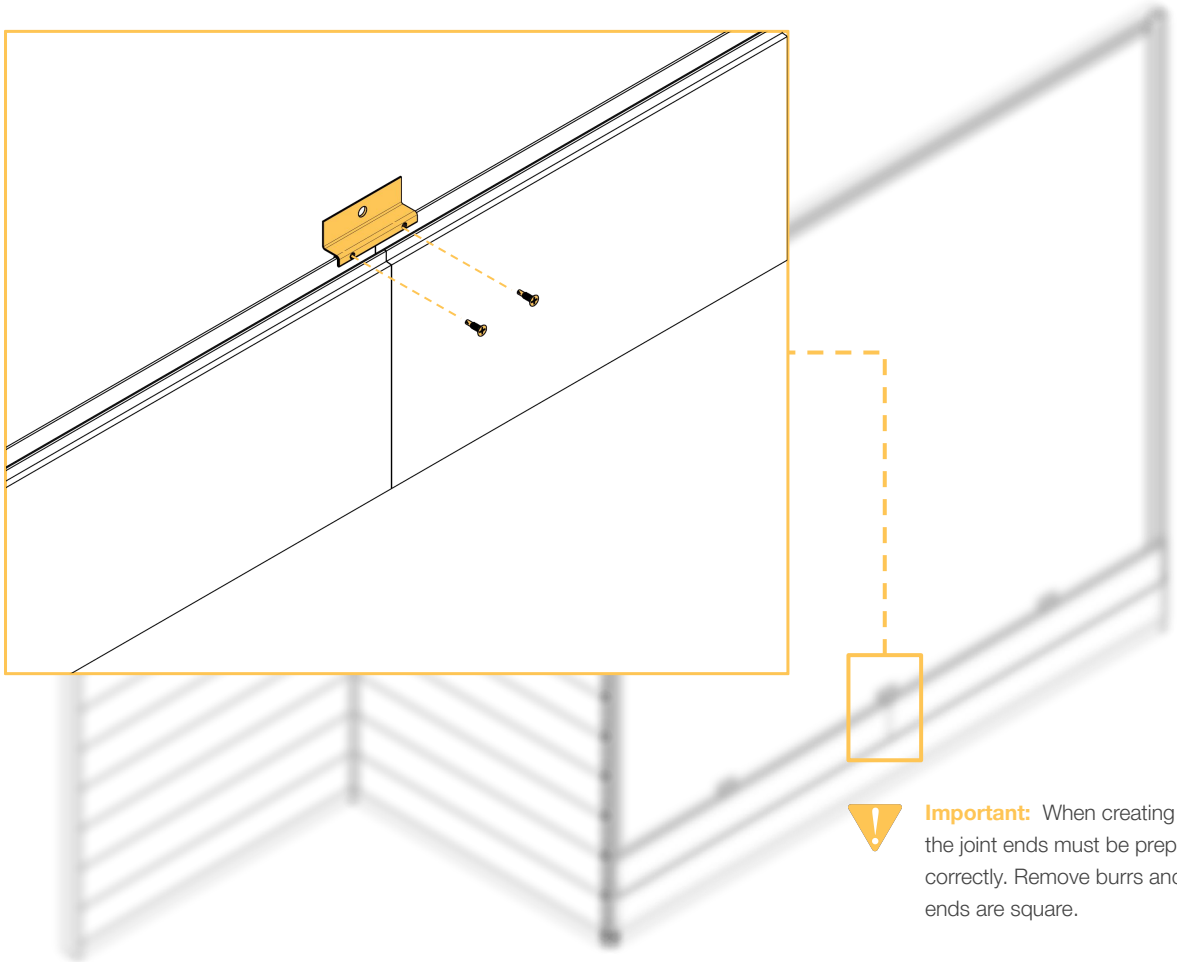
A clip and fastener are to be attached to each plank once every 32" **max**.

If the plank length is less than 32", a minimum of one system clip is required per plank.

02

Plank Install 06

Joint Clip



Important: When creating a butt joint, the joint ends must be prepared correctly. Remove burrs and ensure the ends are square.

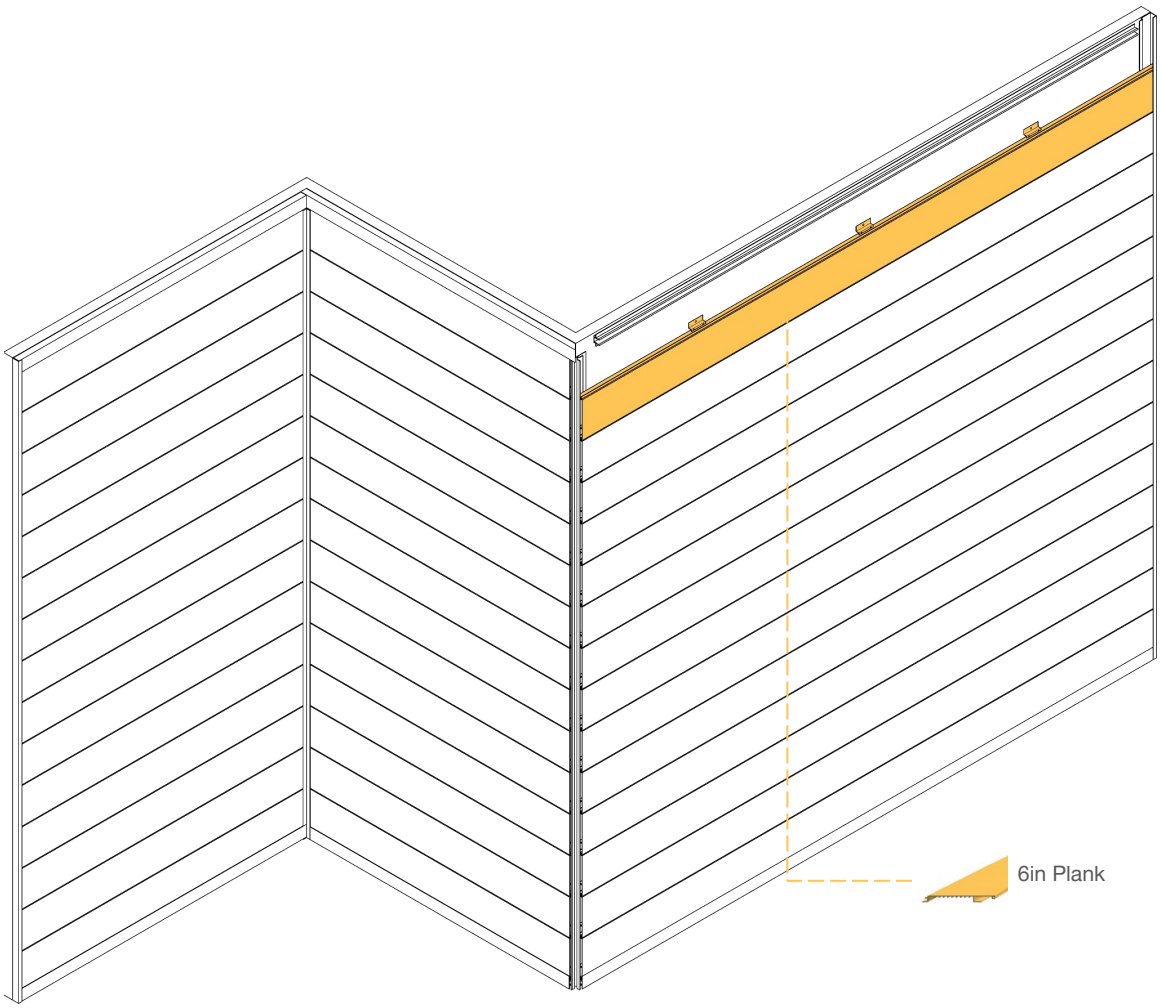
The maximum consecutive run of planks will be 24’ without a vertical brake (e.g., end frame, flat cap, or reveal cap). If the required length exceeds 12’, joining two planks together will be required. A Plank Joint Clip is to be used at the seam of the butt joint to ensure a precision fit.

For situations that require a staggered pattern, ensure that the joints do not intersect.

02

Plank Install 06

Install the final row of plank.



The second-last row of plank is the last row that requires Plank System Clips to be installed.

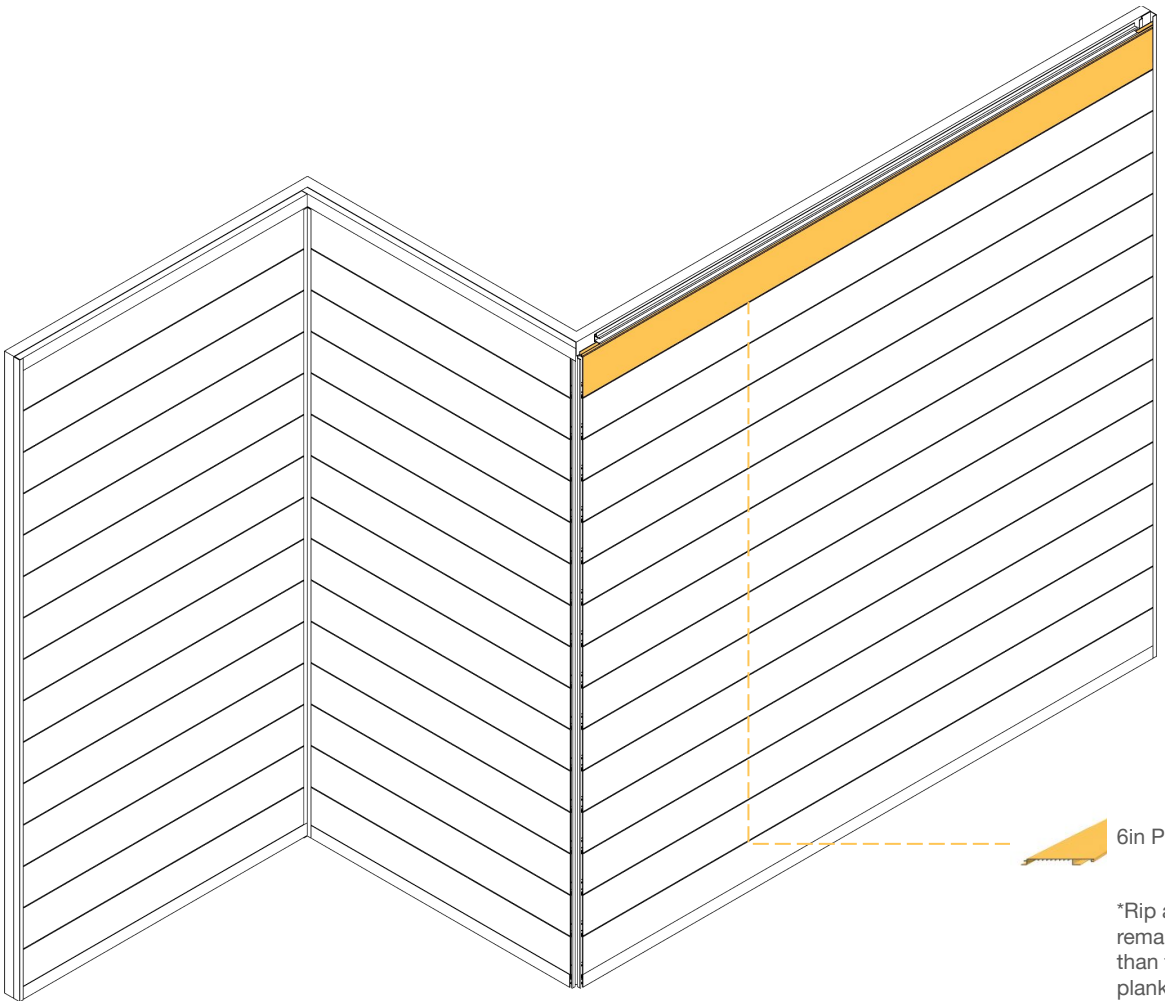
The top or final row of plank does not require Plank System Clips since it will be supported by a top cap.

AL13 How-To

02

Plank Install 07

Determine the final plank width required to terminate at the top of the wall.



*Rip accordingly if the remaining gap is less than the width of the plank.

The final or top row to be installed may require the plank to be ripped to width by a table saw to its appropriate dimension. Due to this, the top row's installation may vary from the regular installation.

If it is required to rip the plank down to a narrower width, the tongue side of the plank is to be removed. In this case, the top row of plank is secured by engaging the perimeter flat cap on to the perimeter back plate.

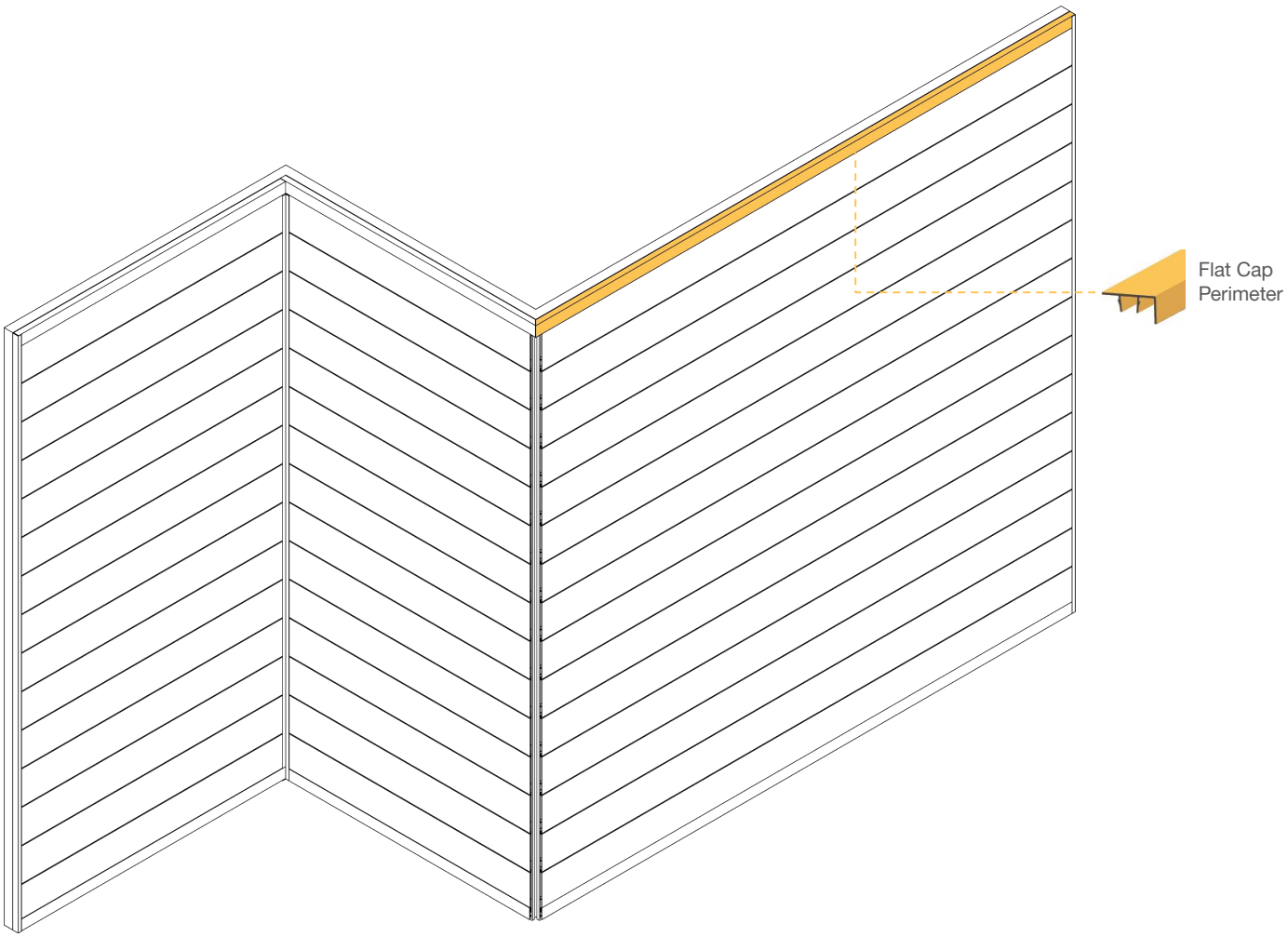
See the Installation Guidelines section for details (p.9).

AL13 How-To #05

02

Plank Install 08

Install the top cap for the final row of plank.



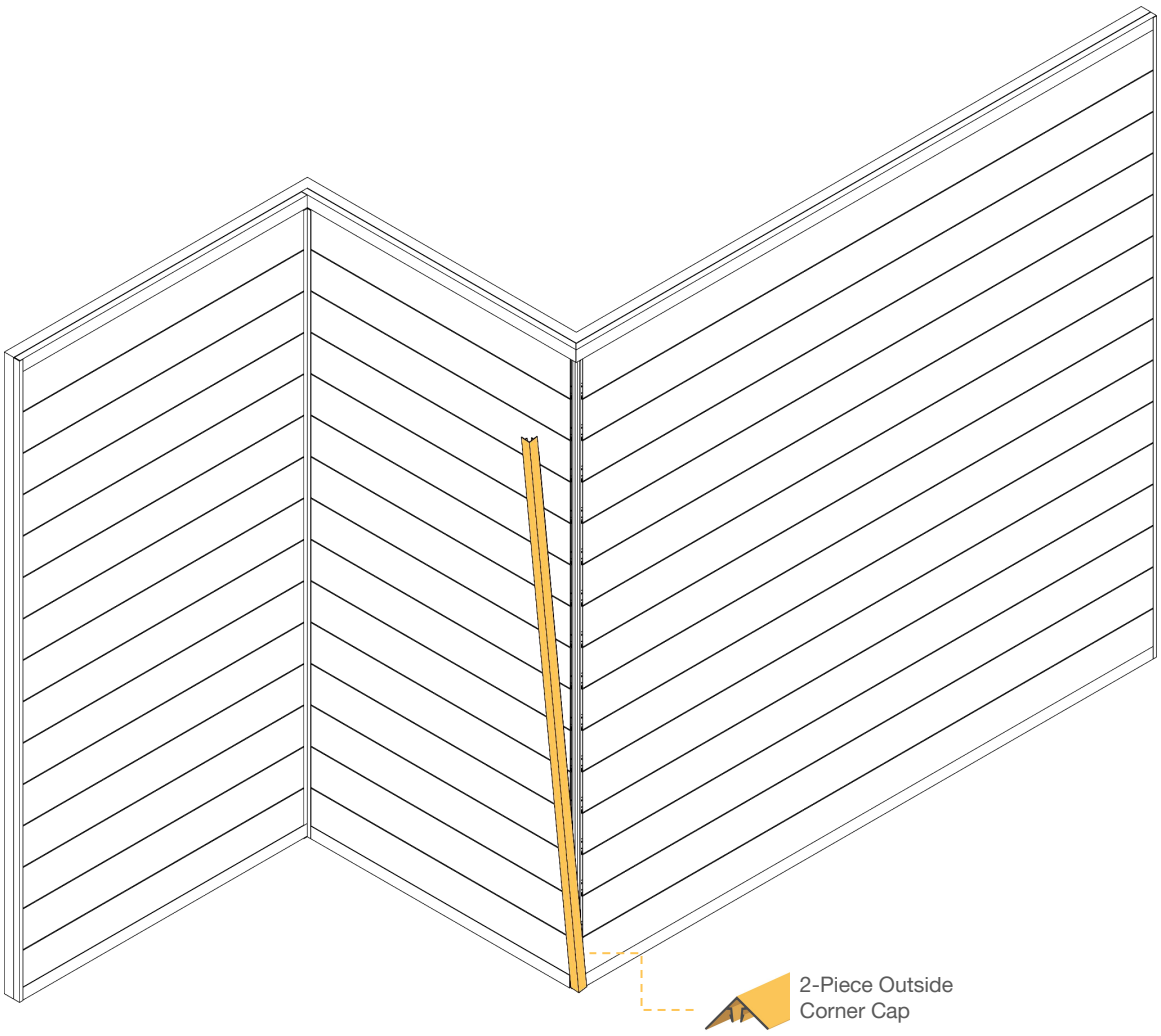
To secure the final row, a perimeter flat cap must be cut to length to fit behind the vertical frame extrusions. A proper fit should allow for a ⅛" gap on either side to allow for thermal expansion and contraction.

The perimeter flat cap should be hammered in place using an AL13® SLED with a rubber mallet.

02

Plank Install 09

Install Outside Corner Cap



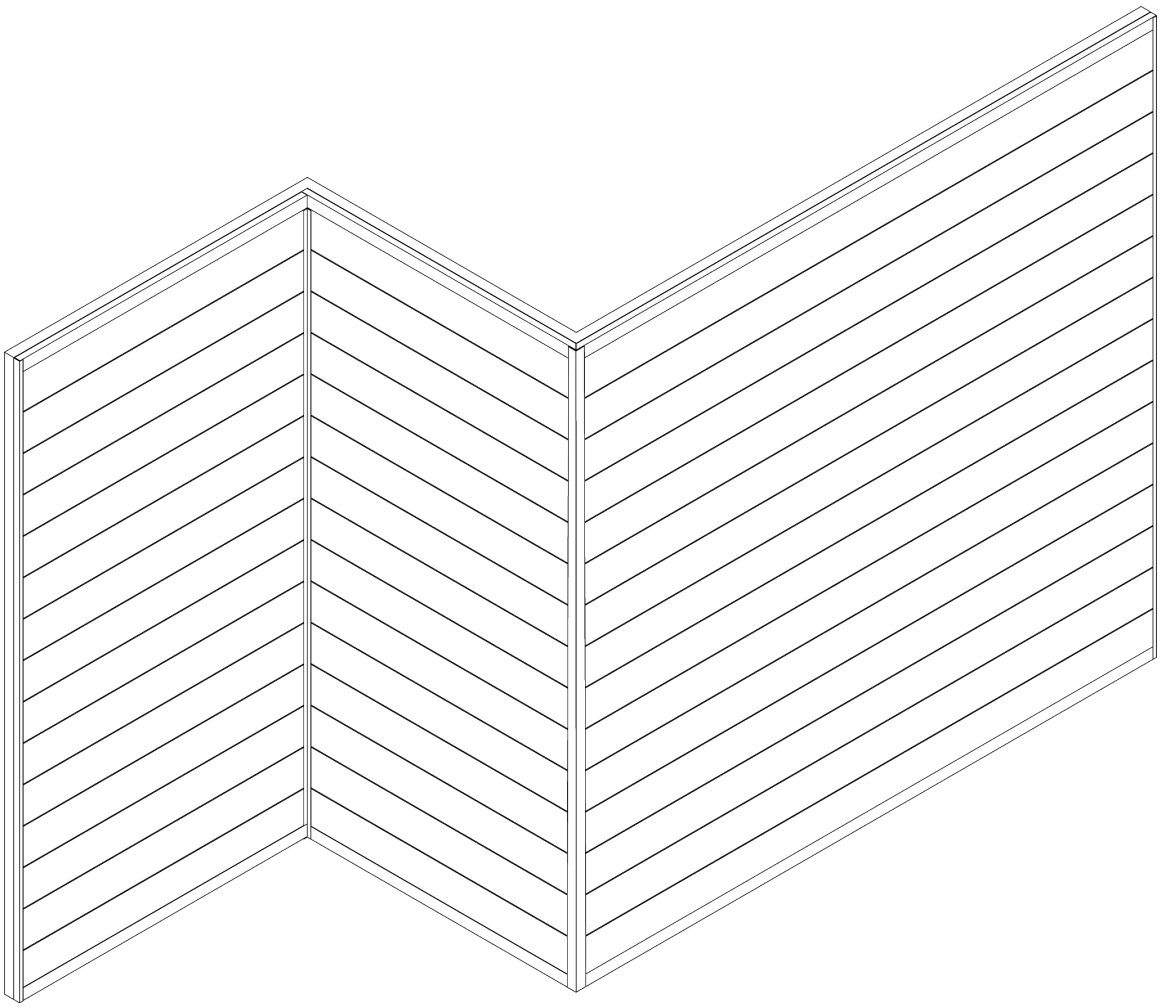
To complete the wall assembly, install the outside corner cap.

Important: Install the outside corner cap with the 2OC SLED. See previous section for details.

02

Plank Install 10

Wall installation is complete.



AL13® Product Warranty

AL13® plank system - 15 YEAR LIMITED PRODUCT WARRANTY, when properly installed and maintained according to the published application. Product is warranted for a period of fifteen (15) years from the date of installation from physical defects. Registration of the product is required for the warranty to be in effect. This warranty is valid for the original purchaser. This warranty provides the following coverage: (a) splitting or cracking of the product, sustained excessive deformation of the product under normal conditions of use and (b) to be free of any buckling of the product itself that is not associated with the substrate and/or structure to which the AL13® plank system is attached. For the purpose of this warranty, buckling shall be defined as warping of the product(s) exceeding one eighth of an inch out of plane per linear foot. If AL13®, after inspection and verification, determines that the product failed under the terms of this limited warranty, the sole and exclusive remedy follows: within a reasonable amount of time after the inspection, repair or replace (at AL13®'s discretion) the defective portion of the product, or may refund the owner for the product(s) affected area, and a reasonable cost of installation. During the warranty period following installation, AL13® will compensate the Owner for correcting the affected area(s) (limited to no more than the original cost of installation) until the end of the limited warranty period for the affected area(s).

Wet Coat Finish Warranty

AL13® - 20 YEAR LIMITED FINISH WARRANTY. AL13® hereby warrants that all finishes on the coated aluminum for 20 years from the date of purchase will not under normal atmospheric conditions: (a) peel, check or crack except for such slight crazing or cracking as may occur on certain areas of the panel; or (b) (1) chalk in excess of a numerical rating of 8 measured in accordance with the standard procedures as outlined by the “Standard Methods of Evaluating Degree of Chalking of Exterior Paint” - ASTM D4214-89; or (2) fade or change in color in excess of 5 color difference units, using ASTM D2244-89 measured on the exposed painted surfaces which have been cleaned of external deposits and chalk and the corresponding values measured on the original or unexposed painted surfaces. The foregoing being subject to the understanding that fading or color changes may not be uniform if the surface is not evenly exposed to the sun and elements; and that gloss (60° incident angle) loss will not exceed 40% when measured on exposed painted surfaces which have been cleaned of external deposits and the corresponding values measured on unexposed original painted surfaces. The gloss shall be measured using standard procedures as defined by “Standard Test Method for Specular Gloss” - ASTM D523-89.

Woodgrain / Solid Color/ Powder Coat Finish Warranty

AL13® - 15 YEAR LIMITED FINISH WARRANTY. AL13® hereby warrants that all finishes on the product coated for 15 years from the date of purchase will not fade in color more than five units as measured by hunter lab color difference as set forth in ASTM D2244 section 6.3 as of the application date and in such way as to significantly adversely affect the appearance of the surface to which the product has been applied and result in damage to the surface. Coated surface will exhibit gloss retention of a minimum of 50% of the original as measured in accordance with ASTM D523 using 60 degree reading. In addition, coating shall not chalk in excess of standard number 8 as illustrated in the ASTM D64214 test method. Coatings when applied and cured on a clean, pretreated substrate will not peel, chip, crack or blister.

Finish Warranty Conditions

The AL13® finish warranty is subject to the following conditions. (a) The warranty only applies under normal atmospheric conditions and excludes corrosive or aggressive atmospheres such as those contaminated with chemical fumes, salt or other corrosive elements, including areas within 305 meters (1000 feet) of a body of salt water. AL13® recommends a fresh water cleaning/maintenance program be in effect to prevent corrosion from accumulated deposits. (b) The warranty will not apply to any coated surface, which is not on the exterior surface of a building. (c) The warranty will not extend or The AL13® plank system finish warranty is subject to the following conditions: (a) Normal atmospheric conditions exclude corrosive or aggressive atmospheres such as those contaminated with chemical fumes, salt or other corrosive elements, including areas within 305 meters (1000 feet) of a body of salt water. AL13® recommends a fresh water cleaning/maintenance program be in effect to prevent corrosion from accumulated deposits (b) The warranty will not apply to any coated surface, which is not on the exterior surface of a building. (c) The warranty will not extend or cover: (1) Damage to the coating occasioned by moisture or other contamination detrimental to the coating because of improper storage of the coated metal prior to installation; (2) Water damage due to condensation caused by improper packaging of the coated metal prior to installation; (3) Damages to the coated metal caused by handling, shipping, processing and/or installation; or (4) Damages to the coated metal caused by scratching or abrading after installation; or (5) Damages to the coated metal as a result of standing water in horizontal installations; (d) The warranty will not be applicable to damage or failure, which is caused by acts of God, falling objects, external forces, explosions, fire, riots, civil commotions, acts of war, or other such similar or dissimilar occurrences beyond AL13®'s control. (e) Customer shall maintain adequate records to establish identification of the coated material and dates of the installation of the coated metal. Customers shall demonstrate that the failure of the coated metal was due to a breach of he warranty stated herein. (f) AL13® exclusive liability under this warranty, or otherwise, will be limited to refinishing, repairing or replacing - at AL13®'s sole option - the defective coated metal. The warranty on any refinished, repaired or replaced coated metal supplied hereunder shall be for the remainder of the warranty period applicable to the originally coated metal. All warranty work will be performed by a company or contractor selected by AL13®, including the initial inspection to verify the claim. Color variance between replacement or repainted product and original shall not be indicative of a defect.

Disclaimer of Implied Warranties & Limitations of Remedies

THE LIMITED WARRANTIES STATE THE ENTIRE LIABILITY OF AL13® WITH RESPECT TO THE PRODUCTS COVERED BY THEM. AL13® SHALL HAVE NO LIABILITY FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES. NO PERSON IS AUTHORIZED TO MAKE ANY REPRESENTATION OR WARRANTY ON BEHALF OF AL13® EXCEPT AS EXPRESSLY SET FORTH ABOVE, AND ANY SUCH STATEMENT SHALL NOT BE BINDING ON AL13®. EXCEPT AS EXPRESSLY SET FORTH ABOVE, AL13® MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. WARRANTIES SHALL BE THE DURATION OF THE LIMITED WARRANTY OR SUCH SHORTER DURATION AS PROVIDED UNDER APPLICABLE LOCAL LAW. THESE LIMITED WARRANTIES GIVE YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM AREA TO AREA. All questions concerning the meaning or applicability of this limited warranty are to be decided under the laws of Washington State in the United States of America without reference to its choice of-law rules. Any claims, demands or causes of action for defects or representations of any nature or damages arising from such defects or representations shall be subject to the exclusive jurisdiction of courts located in Washington State. CUSTOMER ACKNOWLEDGES AND AGREES TO THE FULLEST EXTENT PERMITTED BY LAW TO LIMIT THE LIABILITY OF AL13® FOR ANY CLAIMS, LOSSES, COSTS, DAMAGES OR CLAIMS EXPENSES FROM ANY CAUSE(S) (INCLUDING ATTORNEYS’ FEES AND COSTS AND EXPERT WITNESS FEES AND COSTS), SO THAT ANY TOTAL AGGREGATE LIABILITY OF AL13® TO THE CUSTOMER SHALL NOT EXCEED THE CONTRACT PRICE PAID BY CUSTOMER. THIS LIMITATION APPLIES TO ANY LIABILITY OR CAUSE OF ACTION, HOWEVER ALLEGED OR ARISING, INCLUDING THOSE SEEKING CONSEQUENTIAL DAMAGES. THIS DISCLAIMER AND EXCLUSION SHALL APPLY EVEN IF THE EXPRESS WARRANTY SET FORTH ABOVE FAILS OF ITS ESSENTIAL PURPOSE. CUSTOMER ACKNOWLEDGES AND AGREES THAT AL13® HAS SET ITS PRICES IN RELIANCE UPON THE DISCLAIMERS OF WARRANTY AND THE LIMITATIONS OF LIABILITY SET FORTH HEREIN, REFLECTING AN ALLOCATION OF RISK BETWEEN THE PARTIES (INCLUDING THE RISK THAT A REMEDY MAY FAIL OF ITS ESSENTIAL PURPOSE AND CAUSE CONSEQUENTIAL LOSS), AND THAT THE SAME FORM AN ESSENTIAL BASIS OF THE BARGAIN BETWEEN AL13® AND CUSTOMER.CONSEQUENTIAL LOSS), AND THAT THE SAME FORM AN ESSENTIAL BASIS OF THE BARGAIN BETWEEN AL13® AND CUSTOMER.

Limitations

THE LIMITED WARRANTIES ARE SUBJECT TO THE FOLLOWING GENERAL PROVISIONS AND LIMITATIONS. The limited warranties are effective only if there is proper storage, handling, installation and maintenance of the product in strict accordance with the instructions. Claims must be made in writing to AL13® within 30 days of the discovery of a problem and authorization obtained prior to beginning any repair or replacement work. The claimant must provide proof that he / she is a covered person. Claims can be made by writing to AL13® at the Product Performance Department. After receiving such notice, AL13® must be given an opportunity to inspect and verify the claim. AL13® shall have no liability for defects or damage resulting from (a) misuse or abuse, (b) improper installation, including, but not limited to, inadequate protection against all external damage, (c) performance of coating other than those covered by the limited warranties, (d) contact with harmful chemicals, fumes, or vapors, (e) settlement, shrinkage or distortion of the structure, or (f) Fire, wind, flood, lightning, acts of God or other causes beyond the control of AL13®. AL13® shall have no liability for the cost of removing affected products.

Project Details

Owner Full Name:

Owner Phone Number:

Owner Contact Email:

Project Name:

Address:

City:

State/Country:

Install completed on:

Installer:

Architect:

General Contractor:

Supplier:

Submitted on: 2021-3-17 1:34pm

Submitted by:

SUBSTITUTION REQUEST
(During the Bidding/Negotiating Stage)

Project: Thiells-Roseville New Fire Station

65 W Ramapo Rd, Thiells, NY, 10923-2023

Substitution Request Number:

From: Saniflow Corp. / Attn: Samantha Layedra

Date: 3/10/2025

A/E Project Number: TRFD 2302

To: H2M architects + engineers

Re: Substitution/ Equal

Specification Title: TOILET AND MISCELLANEOUS ACCESSORIES

Description: DIAPER CHANGING STATION

Page: 4

Section: 102813

Paragraph: 2.07

Proposed Substitution: Babymedi + Recessed Kit

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

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

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

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

The Undersigned certifies:

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

Submitted by: Samantha Layedra

Signed by: Samantha Layedra

Firm: Saniflow Corp

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

Telephone: 305-424-2433 x. 2021

A/E's REVIEW AND ACTION

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

saniflow a mediclinics company	 babymedi	
Comparison	**BabyMedi®**	**Koala Kare**
Item No.	**CP0016HCS- ASTM**	**KB310-SSRE**
Materials	Bacteria-resistant Polypropylene Plastic and Stainless Steel exterior	Grey injection-molded polypropylene and Stainless Steel exterior
Antimicrobial	Biocote® additive, based on ion silver technology embedded into surface	Microban additive into the bed surface
Dimensions	33 ⅞" W x 18 ⅞" H Depth while open: 22 ½" Closed: 3 ⅞"	41 5/16" W x 26 7/32" H Depth while open: 17 13/32" Closed: 2 23/32"
Weight	35.3 lb	80 lbs
Finshes	Black Stainless Steel Cover Finish	Black finished stainless steel
Liner dispenser capacity	80 units	50 units
Maximum support	220lbs	200lbs
Price Comparison	*$730*	*$1,249.91*
Features	2 Bag hooks Nylon safety straps	1 Bag hook, Nylon safety straps and dual liner cavity
ADA surface mounted	Yes	Yes
Warranty	5-year limited warranty	5-year limited warranty
Certifications	ASTM F2285-04, EN 12221-1, EN 12221-2	ASTM F2285-04(16), ANSI Z535.4, EN 12221:2008+A1: 2013.
Item No.	**Recessed Kit- KT0016HCS**	
Materials	***Wall Box*** - AISI 304 stainless steel with satin finish ***Frame*** - AISI 304 stainless steel with a satin finish	
Dimensions	L:36 1/4" x W:4" x H:27 1/8"	
Thickness	***Wall Box*** - 0.031" ***Frame*** - 0.031"	
Wall Hole Dimensions	L:34 41/64" x W:3 57/64" x 25 33/64"	
Weight	14 Lbs.	
Screws	Not Included	
Price	$480	

BabyMedi® changing stations offer a very high level of safety and cleanliness being the ideal solution for public spaces with models suitable for high traffic facilities providing high strength and durability.

DATA SHEET

babymedi®

saniflow corp
a mediclinics company
Hand Dryer Technology At the Leading Edge

CP0016H-ASTM / CP0016HCS-ASTM / CP0016HCSB-ASTM

General Description

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

Please mark the selected item

☐

code
CP0016H-ASTM
material
polypropylene
finish
white

BabyMedi® changing stations offer a very high level of safety and cleanli

Components & Materials

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

☐

code
CP0016HCS-ASTM
material
polypropylene / stainless steel
finish
white / satin

Technical Specifications

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

☐

code
CP0016HCSB-ASTM
material
white / black

Operation

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

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

For further info please contact SANIFLOW on: Toll free: **1-877-222-9125** or visit our website at **www.saniflowcorp.com**
Tel: +1 (305) 424 2433 Fax: +1 (305) 424 2435 · **sales@saniflowcorp.com**

Installation

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

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

Certificates & Qualifications

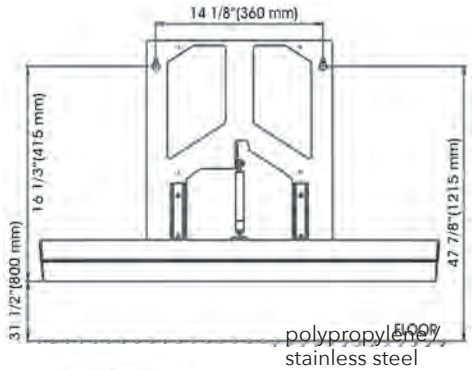
Unit shall be ASTM aprproved, according F2285-04 standard and GS according EN 12221-1 and EN 12221-2 standards.

Ideal location

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

Recommended installation height (handicapped)	27 1/2 at lowest point

MOUNTING



polypropylene/ stainless steel finish

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

CP0016H-ASTM / CP0016HCS-ASTM / CP0016HCSB-ASTM

Guide specification

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

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

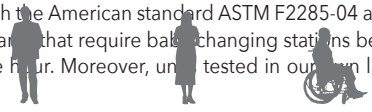
Their trendy and stylish design, allow these baby changing stations to blend into any space perfectly.

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

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

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

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



Overall dimensions:

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

y To mounting brackets	16 3/8" (415 mm)	16 3/8" (415mm)	12 13/32 "(315mm)

Job:	Architect / Engineer:	City / State / Country:
Model number:	Contractor:	Date:
Variations:	Customer / Wholesaler:	Quantity:

DATA SHEET

babymedi®

saniflow corp
a mediclinics company
Hand Dryer Technology At the Leading Edge

KT0016HCS / KT0016HCSB

General Description

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

Components & Materials

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

Recommended heights from floor

	Male	Female	Disabled
x To bottom of unit	31 1/2" (800 mm)	31 1/2" (800 mm)	27 1/2" (700 mm)

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

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

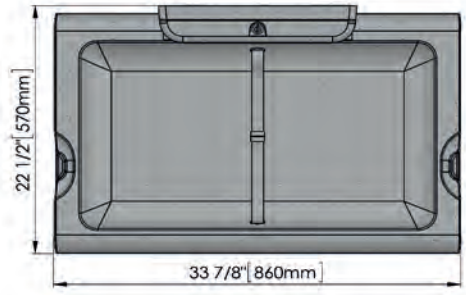
Technical Specifications

Dimensions	L:36 1/4" x W:4" x H:27 1/8"

Please mark the selected item

☐

code
KT0016HCS
material
AISI 304 stainess steel
finish
satin



☐

code
KT0016HCSB
material
AISI 304 stainess steel

Installation

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

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

Ideal location

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

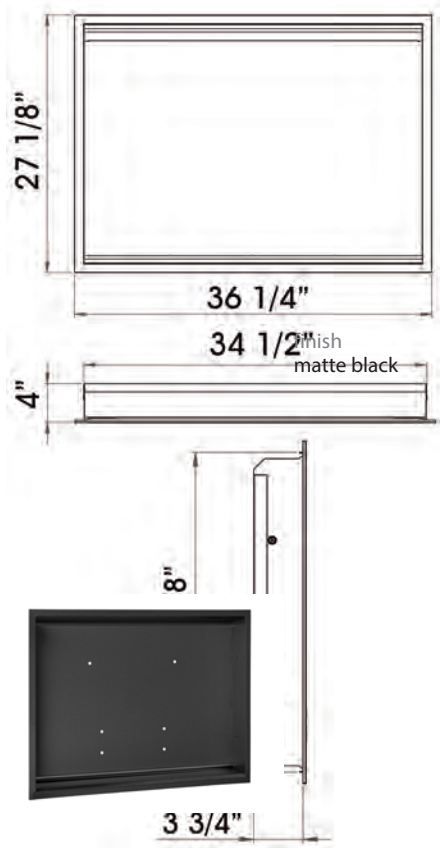
IMPORTANT: the Congress of the United has taken a further step towards gender equality by implementing law 114-235 (10/07/2016). By this law, the American Government states that restrooms, both for men and women, in public buildings all around the country, must have diaper changing facilities in place.

Guide specification

Wall hole dimensions	L:34 41/64" x W:3 57/64" x 25 33/64"
Wall box thickness	0.031"
Frame thickness	0.031"
Net weight	14 Lbs.

DIMENSIONS

KT0016HCS / KT0016HCSB



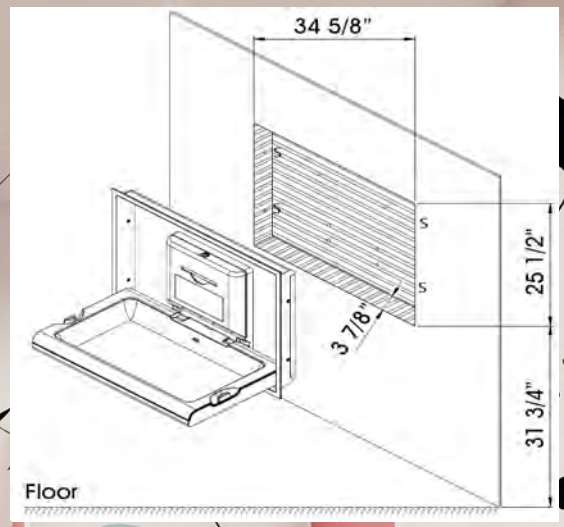
Mounting

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

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

Job:	Architect / Engineer:	City / State / Country:
Model number:	Contractor:	Date:
Variations:	Customer / Wholesaler:	Quantity:

For further info please contact SANIFLOW on: Toll free: 1-877-222-9125 or visit our website at www.saniflowcorp.com
Tel: +1 (305) 424 2433 Fax: +1 (305) 424 2435 · sales@saniflowcorp.com



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

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

Maximum robustness and vandal-proof design.

Excellent integration and aesthetic level

Overall dimensions:

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

Net weight: 14 Lbs.

SUBSTITUTION REQUEST

(During the Bidding/Negotiating Stage)

Project: Thiells-Roseville New Fire Station

65 W Ramapo Rd, Thiells, NY, 10923-2023

To: H2M architects + engineers

Re: Substitution/ Equal

Substitution Request Number:

From: Saniflow Corp. / Attn: Samantha Layedra

Date: 3/10/2025

A/E Project Number: TRFD 2302

Specification Title: TOILET AND MISCELLANEOUS ACCESSORIES

Description: ELECTRIC HAND DRYER

Section: 102813

Page: 4

Article/Paragraph: 2.06

Proposed Substitution :Speedflow Plus

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

Trade Name: Saniflow, a Mediclinics Company Model No.: M17ACS-UL

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

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

The Undersigned certifies:

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

Submitted by: Samantha Layedra

Signed by: Samantha Layedra

Firm: Saniflow Corp

Address: 3325 NW 70th Ave, Miami, FL, 3312

Telephone: 305-424-2433 x. 2021

A/E's REVIEW AND ACTION

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

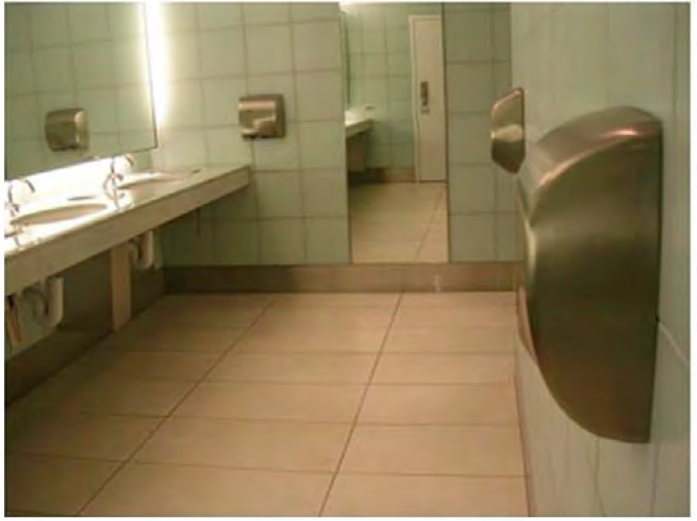
Signed by: Date:

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

speedflow® plus

BuildingGreen APPROVED

U.S. GREEN BUILDING COUNCIL LEED USGBC



SPEEDFLOW PLUS **(M17A, M17AF, M17AC, M17ACS, M17AB)** Efficient, adjustable RPM, ADA compliant, and 5 year warranty		
Technical Specifications	**Speedflow Plus**	**Aerix +**
Electrical	100-120 V, 208 V, 220-230 V	120–277V
Effective Airflow	20-27 CFM	42–64 CFM
Max Air Velocity	250 mph/ 22,000 LFM	225 mph/ 19,800 LFM
Total Power	180-850 W	950 W
Consumption	H. Element OFF: 2.5 - 3.5 A H. Element ON: 4.8 - 7 A	Not Listed
Motor type	High pressure class F, with self-resettable safety cut-out and adjustable speed 23,000-32,000 rpm via potentiomenter to adjust consumption. Motor has been configured to have a smooth start to extend its life.	High pressure universal brush motor, with set speed for 31,000 RPM.
Heating element (W)	0 -500 W (jumper for on/ off option)	nichrome wire heating element
Construction materials	Steel, stainless steel, and cast iron	Aluminum and stainless steel
Air temperature – (at 4” distance/ T amb. 77 ºF)	93-109°F	130°F
List Price	$425	$639.29
Color finish	5 finishes: Stainless steel one-piece cover bright & satin finish, white epoxy, black graphite, or white porcelain in cast Iron	3 finishes: Aluminum white epoxy, stainless steel-stain finish, or aluminum black epoxy.
Dimensions	10 1/2”H x 11 1/2”W x 4”D	14-1/2"H x 12-1/4"W x 3-7/8" D
Operation	Touch-free infrared sensor. Auto 2 second shutoff after hands are removed	Touch-free infrared sensor. Auto 2 second shutoff after hands are removed
Weight	8.4 Lbs.	12.2 lb
Safety shut off	Automatic disconnection after 30 seconds of continous use.	Automatic disconnection after 45 seconds of continuous use.
Drying time	10 -12 seconds	12 seconds
Limited Warranty	5 years	5 years
Noise Level	57-65 db(A)	65-87db(A)
Sensor	Adjustable 2”-8” infrared	Not Listed
HEPA Filter	Yes	Yes
Adjustable motor	Yes	Not Listed
Protection Level	IP23	IP24 Splash protection
BuildingGreen Approved	Yes	No
Contributes to LEED certification	Yes	No
ADA surfaced mounted	Yes	Yes

The Speedflow M17 has improved drying times, exceptional efficiency, and continued versatily. Now with a HEPA Filter included to purify air from dust particles, pollen, and other allergens.

speedflow® plus

sensor operated

Legend for symbols shown on last page of catalog

M17A-UL

material: steel
finish: white epoxy

M17AF-UL

material: cast iron
finish: white porcelain enameled

M17AB-UL

material: steel
finish: black epoxy

M17AC-UL

material: stainless steel AISI 304
finish: bright

M17ACS-UL

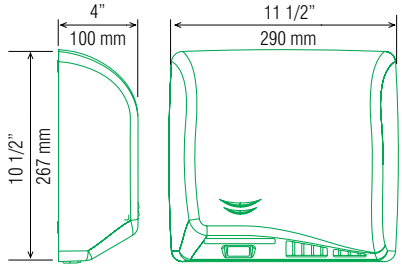
material: stainless steel AISI 304
finish: satin

M17A-UL · M17AF-UL · M17AB-UL · M17AC-UL · M17ACS-UL — COMPONENTS AND MATERIALS

- 3/16” thick cast iron or 1/16” thick stainless steel one piece cover.
- High pressure class F motor, with self.resetable safety cut-out and adjustable speed between 23 ,000 and 32,000 rpm..
- HEPA filter medium cartridge.
- ADA compliant (no recessed kit needed).
- Universal Voltage (from 100 to 240 V).
- Sensors come with a vandal-resistant polycarbonate viewing window.
- Cover fixed to the base by means of 2 vandal-proof lock screws and lock with special Speedflow wrench.
- Fully adjustable (2” – 8”) IR electronic detection sensor by means of a potentiometer.
- Automatic disconnection system after 30 seconds of continuous use.
- Heating element with a self-resettable safety cut-out. It can be switched off manually with an ON/OFF micro switch located on the electronic board.
- Aluminum centrifugal double asymmetrical inlet fan wheel.
- Fire resistant plastic UL 94-V0 fan scroll.
- UL and CSA approved
- Optional odor neutralizer tablet for a cleaner and more pleasant atmosphere in the washroom.

M17A-UL · M17AF-UL · M17AB-UL · M17AC-UL · M17ACS-UL — TECHNICAL SPECIFICATIONS

Estimated drying time	10-12 seconds	Total Power:	180 - 850W
Voltage	100-120 V; 208V; 220-240 V	Heating Element:	500 W
Frequency	50/60 Hz	Protection level	IP23
Power Consumption	H. Element OFF: 2.5 - 3.5 A H. Element ON: 4.8 - 7 A	Effective airflow	20 - 27 CFM
Electrical insulation	Class I (ground required)	Air temp (at 4” distance/77ºF)	93º - 103ºF
Motor Power	350 W	Dimensions	11-1/2”x 10 5/8”W x 4”
rpm	23,000 - 32,000 rpm	Weight	All: 8,4 Lbs M17AF-UL: 15,65 Lbs
Air speed:	250 mph	Noise level	57-65 dBA



Dimensions for M06A/AB/AC/ACS

DATA SHEET

speedflow® plus

saniflow corp
a mediclinics company
Hand Dryer Technology At the Leading Edge

M17A-UL / M17AB-UL / M17AC-UL / M17ACS-UL / M17AF-UL

General Description

250 mph

- Warm air high speed hand dryer recommended for very high traffic areas.
- Surface mounted ADA-compliant.
- Maximum robustness and vandal-proof.
- Energy efficient, it only consumes 2.8 watts per drying cycle.
- Building Green Approved & offering LEED Credits.
- HEPA filter medium cartridge which filters solid particles in suspension, improving air quality.
- Universal voltage.

Components & Materials

- **M17A-UL:** 1/16" (1.5 mm) thick one-piece steel cover; white epoxy finish
- **M17AB-UL:** 1/16" (1.5 mm) thick one-piece steel cover; black epoxy finish
- **M17AC-UL:** 1/16" (1.5 mm) thick one-piece stainless steel cover; bright finish
- **M17ACS-UL:** 1/16" (1.5 mm) thick one-piece stainless steel cover; satin finish
- **M17AF-UL:** 3/16" (4.5 mm) thick one-piece cast iron cover, white porcelain finish
- **MOTOR:** High pressure class F, with self-resettable safety cut-out and adjustable speed between 23,000 and 32,000 rpm. This regulation is carried out manually by means of a potentiometer located on the electronic board to adjust the power consumption of the dryer. The motor has been configured to have a smooth start to extend its life.
- **ELECTRONIC DETECTION SENSOR:** by infrared beam with detection distance adjustable by potentiometer between 2" and 8". It incorporates a safety system that detects any fixed target and makes hand dryer stop automatically in case a fixed object is placed in front of the sensor. In addition it has an automatic disconnection system of the unit after the 30 seconds of continuous use of the dryer.
- **500 W HEATING ELEMENT:** with a self-resettable safety cut-out. It can be switched off manually with an ON/OFF micro switch located on the electronic board, allowing to regulate the power consumption of the hand dryer.
- **BASE PLATE:** made of aluminum, it incorporates acoustic dampening elements (silent-blocks) for the suppression of mechanical vibrations.
- **FAN SCROLL:** made with Polyamide 6 (PA 6) incorporating a flame retardant additive (UL 94 V0) that increases the resistance to plastic ignition and once ignited reduces the rate of flame propagation.
- **HEPA FILTER MEDIUM CARTRIDGE:** Filters solid particles in suspension, significantly improving air quality. This filter traps micro particles in the air such as pollen, dust mites, fungi, tobacco smoke, etc..
- **ODOR NEUTRALIZER TABLET:** an optional odor neutralizer tablet for a cleaner and more pleasant atmosphere in the bathroom is available (Code RCPOM14).
- **WALL FIXING ELEMENTS:** stainless steel screws for brick wall with their corresponding plastic plugs are provided with the hand dryer.

Technical Specifications

Voltage - 100-120V; 208V; 220-240V	Total power - 180- 850 W
Frequency - 50/ 60 Hz	Motor Power - 350 W
Insulation - Grounding required (Class I)	Heating element: 0 or 500W
Dimensions M17A/AC/AB/ACS 10 1/2"H x 11 1/2"W x 4"D M17AF 10-5/8"H x 11-5/8"W x 4"D	Consumption H. Element OFF: 2.5 – 3.5A H. Element ON: 4.8 – 7A
Weight - M17A/AC/AB/ACS - 8.4 Lbs. M17AF - 15,65 Lbs.	r.p.m. - 23,000-32,000 rpm
Effective airflow - 20-27 CFM	Air temperature – (at 4" distance/ T amb. 77 °F) 93-109 °F
Max air velocity - 250 mph/ 22,000 LFM	Drying time - 10 – 12 sec
Protection level - IP23	Noise level (at 79") - 57 – 65 dBA

Please mark the selected item

☐ 

code
M17A-UL
material
steel
finish
white epoxy

☐ 

code
M17AB-UL
material
steel
finish
black epoxy

☐ 

code
M17AC-UL
material
stainless steel
AISI 304
finish
bright

☐ 

code
M17ACS-UL
material
stainless steel
AISI 304
finish
satin

☐ 

code
M17AF-UL
material
cast iron
finish
white porcelain
enamelled coating

Operation

Place hands under the air outflow valve. The dryer will start automatically, and go on with no interruption as long as the hands are kept in the detection range of the sensor. The appliance will stop 2 seconds after the hands are removed from the airflow.

For further info please contact SANIFLOW on: Toll free: **1-877-222-9125** or visit our website at **www.saniflowcorp.com**
Tel: +1 (305) 424 2433 Fax: +1 (305) 424 2435 · **sales@saniflowcorp.com**

Installation

Verify all rough-in dimensions prior to installation. Hand dryers require a dedicated circuit and must be properly grounded. A GFCI (Ground fault circuit interrupter) is recommended. . One side of dryer should be mounted to a stud.

Certificates & Qualifications

Unit shall be UL and CSA approved, according to UL 499; CSA C22.2 Standards and Building Green Approved. UL and CSA approved according to UL 499 and CSA C22.2 Standards.

N° dryers to be fitted

- In toilet areas with a normal frequency of use and only one wash-basin: 1 dryer.
- In toilet areas with a normal frequency of use and more than one wash-basin: 1 dryer for each 2-3 wash-basins.
- 1 row of 4 wash basins: 2 dryers; 1 row of 6 wash basins: 3 dryers; 1 row of 8 wash basins: 4 dryers.
- In toilet areas with high traffic and more than one wash-basin: 2 dryers for each 3 wash-basins.
- 1 row of 4 wash basins: 3 dryers; 1 row of 6 wash basins: 4 dryers; 1 row of 8 wash basins: 5 dryers.

Ideal location

Between the wash-basin and exit. It is not recommended to install dryer between wash-basins, next to urinals, lavatories and showers. If installing automatic dryers over marble surface or ledge, the minimum distance from the dryer to the ledge must be 15-3/4". It is recommended that hand dryers be distributed throughout the washroom area to avoid overcrowding.

Guide Specification

Surface-mounted ADA compliant hand dryer shall have a 1/16" thick steel cover with white epoxy finish (M17A-UL), or a 1/16" thick steel cover with black finish (M17AB-UL), or a 1/16" thick stainless steel cover with bright finish (M17AC-UL), or a 1/16" thick stainless steel cover with satin finish (M17ACS-UL), or a 3/16" thick cast iron with white porcelain enamelled coating (M17AF-UL). Hand dryer shall include aluminum base plate 1/8" thick, infrared sensor adjustable (2" to 8") via potentiometer , universal brush motor fully adjustable (23,000-32,000 RPM) via potentiometer as well and HEPA filter medium cartridge which filters solid particles in suspension, significantly improving air quality. Dryer shall operate at 57-65 dBA while delivering 20-27 CFM of air at 109 °F (42°C) and 250 mph as maximum air velocity (Max – 22,000 LFM) during user controlled drying cycle. Dryer shall have a total power of 180 - 850 W with a consumption of 2.5 – 7 A. Heating element made of Ni-Cr and with a self-resettable safety cut-out. It can be switched off manually "ON / OFF" micro-switch located on the electronic board, allowing to regulate the power consumption of the hand dryer. In case of motor failure the heating element is immediately switched off automatically.

Unit shall be UL and CSA approved, according to UL 499, CSA C22.2 standards, and Building Green Approved.

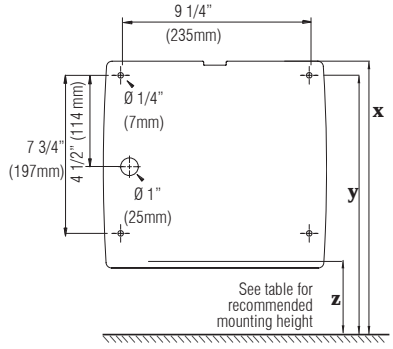
Overall dimensions:

M17A, M17AB, M17AC, M17ACS: 10 1/2"H x 11 1/2"W x 4"D (270mm x 290 mm x 100 mm)
M17AF: 10-5/8"H x 11-5/8"W x 4"D (270 mm x 295 mm x 102 mm)

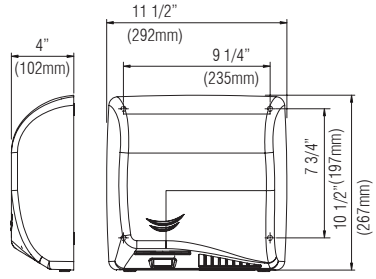
Recommended heights from floor

	Male	Female	Child	Disabled
x To top of machine	56" / 142 cm	54" / 137 cm	46" / 117 cm	48" / 122 cm
y To mounting bracket screw	55" / 140 cm	53" / 135 cm	45" / 115 cm	47" / 120 cm
z To sensor top	46" / 117 cm	44" / 112 cm	36" / 92 cm	38" / 97 cm

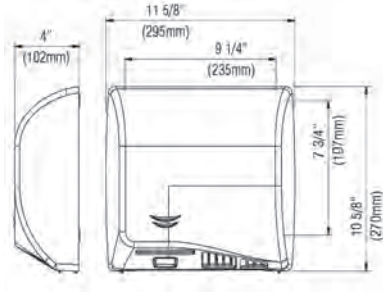
MOUNTING



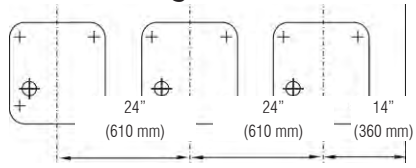
M17A-UL / M17AB-UL / M17AC-UL / M17ACS-UL



M17AF-UL



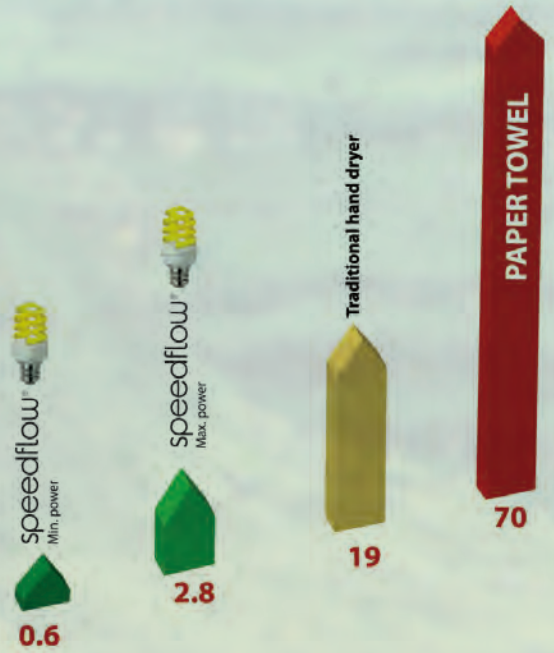
Serial mounting



Job:	Architect / Engineer:	City / State / Country:
Model number:	Contractor:	Date:
Variations:	Customer / Wholesaler:	Quantity:

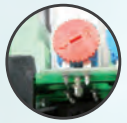
The new generation of **SPEEDFLOW** ® hand dryers is quicker, more hygienic, more comfortable, quieter and more energy-efficient, providing a unique experience in the hand drying field.

CONSUMPTION IN WATTS HOUR PER DRYING CYCLE



LOW CONSUMPTION

Minimum consumption
Between 0.6 and 2.8 W/h per drying cycle and 0.4 W in stand-by. One of the lowest in the market.



Adjustable motor speed
Adjustable energy consumption, noise level and drying time, consequently.

Heating element with ON/OFF micro-switch
Placed in the electronic circuit board, makes it possible to activate/ deactivate the heating element.

COMFORT

Heating element
Energy saving (only 500W), to ensure maximum comfort when drying hands.

Quiet. 57 dBA
Thanks to the acoustic dampening elements used and a better-balanced mechanically motor, among others.

Air curtain drying
A well-designed air outlet blows air caressing and drying hands thanks to a pleasant air curtain.

HYGIENE

Automatic activation
The user does not need to touch the hand dryer, which helps prevent cross-contamination, improving hygiene and asepsis.

HEPA filter medium
Cleans the air stopping the particles of dirt, dust, bacteria, pollen, etc. Fresh and particle-free air.

Odor neutralizer tablet
For a more pleasant atmosphere in the washroom.

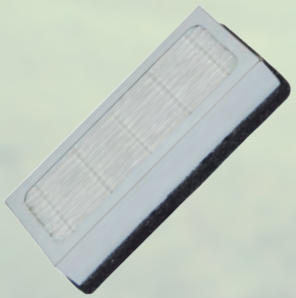
SAFETY

Fixed-target detection
If a static object is detected by the sensor, the hand dryer automatically stops after 3-5 seconds as a security measure.

Automatic safety cut-out
After 30" of continuous use, the hand dryer switches off automatically.

Vandal-proof locking system
The metal casing is fixed to the aluminium base plate by means of 2 vandal-proof screws.

Air quality and noise pollution improvement thanks to its new filter and inner design



The new **SPEEDFLOW®** comes as standard with a cartridge that holds an HEPA filter medium that filters suspended solid particles (pollen, dust mites, cigarette smoke, etc.), notably improving the air quality.

Furthermore, this cartridge also contains and activated carbon filtering medium that neutralizes odours and absorbs fumes and gases, helping avoid bad odours.

The new **SPEEDFLOW®** is much quieter thanks to:

- The acoustic dampening elements used for fixing the nozzle to the base plate and also in the motor bracket.
- A inner nozzle design which minimizes the pressure drop and the turbulences, reducing the noise level consequently.
- The air outlet geometry minimizing unwanted acoustic effects .
- A motor with a built-in fan, better-balanced mechanically, reducing the vibrations transmitted to its supports

REQUEST FOR SUBSTITUTION FORM

Project: TRFD2302 Thiells New Fire Headquarters

Substitution Request Number:_____

Contractor: Elite Storage Products

Address: 60 Front Street, Rossville, TN, 38066

To: H2M Architects + Engineers

Date: 3/3/25

H2M Project Number: TRFD2302

Owner: Thiells-Roseville Fire District (TRFD)

Contract Name:_____

Contract No.:_____

Specification Title: Phenolic Lockers and Benches

Section: 105129

Page: 1

Article/Paragraph: 2.01

Drawing No(s).:_____

Proposed Substitution: LockersMFG Phenolic Lockers

Manufacturer: LockersMFG

Address: 60 Front Street, Rossville, TN, 38066

Trade Name: Division 10 Lockers

Phone #: (901) 367-3930

Installer: Elite Storage Products

Address: 60 Front Street, Rossville, TN, 38066

Phone #: (901) 367-3930

History: ___New product ___2-5 years old ___5-10 years old _X_ More than 10 years old

Differences between proposed substitution and specified product:

Better or equal product

_X_ Point-by-point comparative data attached

Reason for not providing specified item (Attach separate sheet if necessary):

Typical Similar Installation:

Project: Please See Attached Comparison Sheet

Engineer / Architect:_____

Address:_____

Owner:_____

Date Installed:_____

Submit complete installation list on separate sheets.

Proposed substitution affects other parts of Work: _X_ No ___ Yes

Explain:_____

Gross Savings to Owner for accepting substitution: $ Possible Savings

Proposed substitution changes Contract Time: _X_ No ___ Yes

Add / deduct (circle): N/A days

Supporting data attached for evaluation of the proposed substitution:

_X_ Product Data _X_ Photos _X_ Drawings _X_ Tests _X_ Reports _X_ Samples

___ Other (explain):_____

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

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

LOCKER PRODUCT COMPARISON

	LockersMFG Phenolic Locker Series	ASI Phenolic Traditional Collection
Top	MKH Inch	1/2 Inch
Back	MKH Inch	3/8 Inch
Side	MKH Inch	3/8 Inch
Bottom	1/2 Inch	1/2 Inch
Doors	½ Inch	½ Inch
Latch	Continuous Latch	Continuous Latch
Lock Compatible	Yes	Yes
ADA Compliancy	1T, 2T - Yes	1T, 2T - Yes
Door Frame	½ Inch	½ Inch
Ventilation	meets specs	meets specs
Interior Equip.	MKH Inch	3/8 Inch
Shelf	MKH Inch	3/8 Inch
Hinge	Concealed p-Knuckle	18 Gauge Steel
End Panels	MKH Inch	3/8 Inch
Widths	meets specs	4 available widths
Pedestals	10	10
Bench tops	1-¾ Inch	1-¼ Inch thick
Material	Phenolic	Phenolic
Warranty	Lifetime	20 year
Size	WxDxH meets spec	WxDxH meets spec
Hardware	n/a	n/a
Lead time	12-16 Weeks	26-32 Weeks

Highlights Demonstrate Increase Quality Items

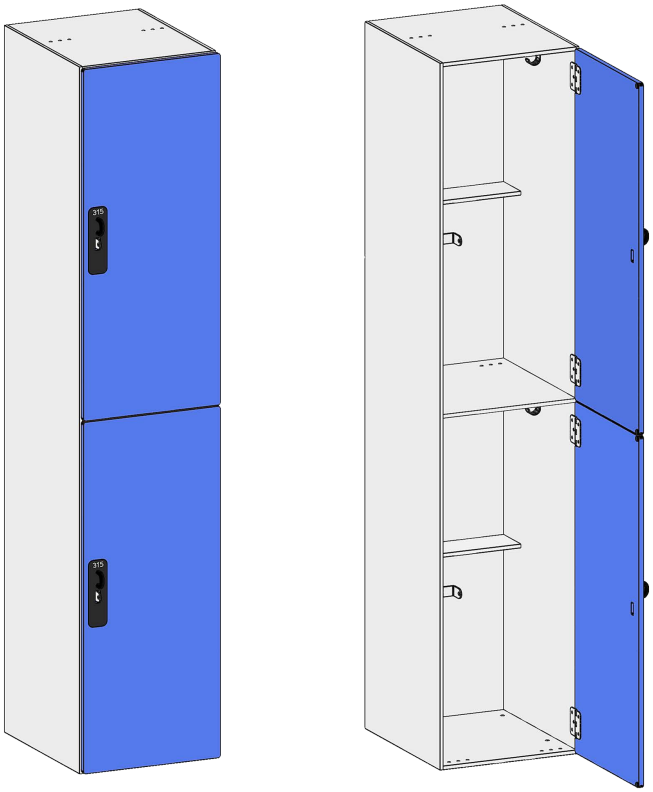
Lockers Manufacturing - PO Box 208 Como, MS

Ph: (662) 338-4340

LOCKERS™

MANUFACTURING any design. any material. any technology.

Two Tier Phenolic Locker



Construction	
Mortise & tenon joints	Full overlay doors
Stainless steel fasteners	Enhanced ventilation
Stainless steel coat hooks	Engraved ID plates

Material thickness		
Top, Bottom & Shelves	White	3/8”
Sides & Backs	White	5/16”
Doors	Std Colors	1/2”

Sizes	
Height	24”, 36”, 48”, 60”, 72”, 84”, 96”
Width	9”, 12”, 15”, 18”, 20”
Depth	12”, 15”, 18”, 20”

Hinges
Concealed SS (std)
ADA hinge
Continuous SS

Fastening
Concealed (std)
Through bolt door

Options	
Sloped tops	Through door ventilation
Adjustable base	Class A fire rating
SS coat rod	Door magnets
Thicker materials	Custom body color

Lock options		
Hasp	Day use/Digital	Assigned/Digital
Key	Day use/Mechanical	Combination
RFID	Assigned/Mechanical	Coin operated

Lockers Manufacturing reserves the right to implement changes to the design and dimensions.

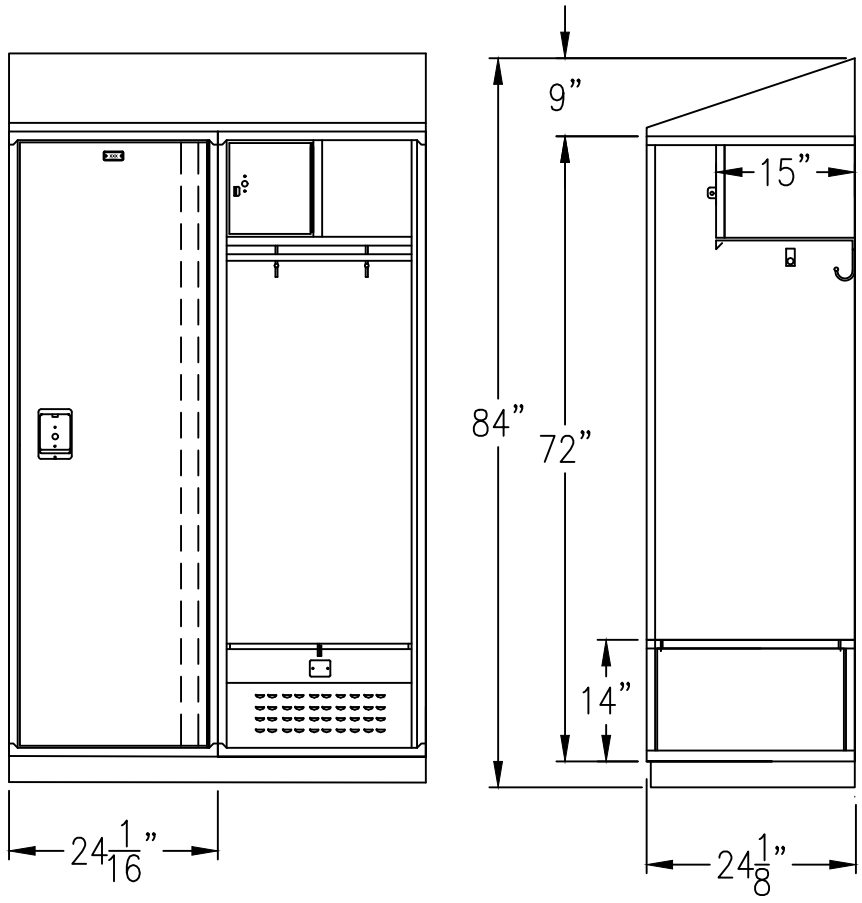
Phone: 662-338-4340 | sales@lockersmfg.com | www.lockersmfg.com

PRODUCT FEATURES	
Security Box :	None Provided
Foot Locker:	None Provided
Handle :	Continuous Latch W/ Finger Lift
Hinge :	Continuous Plastic Hinge, Full Length Of Door And Body
Bottom :	Solid Plastic Components, 3/8" Thick
PRODUCT INFORMATION	
Material :	Phenolic
Construction :	1/2" Thick Solid Plastic
Door :	Solid Plastic Components, 1/2" Thick
Door Ventilation :	Solid Plastic
Door Latching :	Spring-Loaded Positive Latch
Top :	Solid Plastic Components, 3/8" Thick
Side :	Solid Plastic Components, 3/8" Thick
Back :	Solid Plastic Components, 3/8" Thick
Interior Equipment :	(2) SGL Prong Wall Hooks, (1) Coat Rod Per Opening
Number Plate :	Polished Aluminum Plate, Riveted
Assembly :	Secured By Plastic Welds
ACCESSORY INFORMATION	
Slope Hood :	Slope Hoods
Lock :	None Provided
Legs :	None Provided
Base :	3" Continuous Base
Recess Trim :	None Provided

Comments:

Color : Please Advise Within Reasonable Variation

Phenolic Openfront Series
W/ Security Box & Foot Locker
24 x 24 x 72"



SAMPLE PHENOLIC CUTSHEET

*If awarded project, CAD Engineer will create project specific cutsheet

JOB INFORMATION				
Locker Area :	LR 119	LR 117B	LR 120	LR 116B
Frame/Openings :	5/5	13/13	2/2	16/16
Product Line :	Phenolic Openfront Locker			
Size :	24x24x72"			

Original : 08/21/2024
Revised :
Drawn By : LMK
Reviewed By : RH
Page : 1 of 1

Dealer : Elite Storage Products
Installer : Please Advise
Contractor : Please Advise
Job ID : Lincoln County Emergency S
Location : Troy, MO

PO# : LOI

LOCKERS™ MANUFACTURING any design. any material. any technology.

File: ORD0010800.dwg

PLEASE BE ADVISED: Lockers Are Square And Measured Based On Square Walls. If Walls Are Not Square, Adjustments To Bases Will Need To Be Made At The Expense Of The Customer To Make Allowances For The Locker Sizes As Specified In The Shop Drawings.

Tolerances in Manufacturing Understood: Fractions $\pm\frac{1}{16}$", Decimals ±.02, Degrees ± 20°

PLEASE BE ADVISED:
Shop Drawings Are To Ensure We Understand Your Request. Your Approval Of These Shop Drawings Overrides Any Other Specifications Or Documentation. Please Check And Approve As We Are Going To Manufacture Material As Shown On These Drawings.

LOCKERS™
MANUFACTURING any design. any material. any technology.

NORTHEAST REFERENCE LIST

Project: Victor Central School District – 2021 Capital Improvement Project
Address: 953 High Street, Victor, NY 14564
Price: $115,307
GC: Javen Construction
Contact Information: Whitey Charland (PM) - C. 585-737-8516 - O. 585-381-9970 - EM. whitey@javen.com
Architect: SWBR Architects
Contact Information: 585-232-8300
Owner: Victor CSD

Project: Manheim Central High School Additions and Renovations
Address: 400 East Adele Avenue Manheim, PA 17545
Price: $220,922.81
GC: Lobar Construction Inc
Contact Information: Nathan Walker (PM) - O. 717-432-9728 Ext. 4293 - EM. nathan.walker@lobar.com
Architect: Crabtree Rohrbaugh & Associates
Contact Information: 717-458-0272
Owner: Manheim Central School District

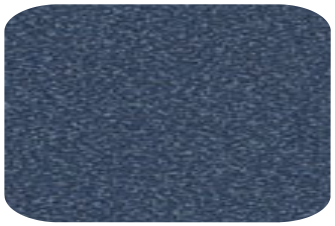
Project: Pierrepont Elementary School
Address: 70 Pierrepont Avenue, Rutherford, NJ 07070
Price: $60,578.00
GC: Bismark Construction Corporation
Contact Information: Peter Youssef (PM) (973)412-9223 Peter@bismarkcorp.com
Architect: Parette Somjen Architects
Contact Information: 973-586-2400
Owner: Rutherford Board of Education

DISCLAIMER* Pictures shown are not representations of the projects listed.

4623 Midnight Cosmos

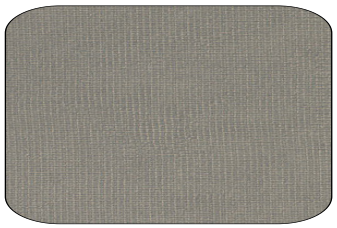
SL4142 Frosted Slate

SL7022 Nature's Textile



SL7018 Midnight Blueprint

SL3687 Maple Slate



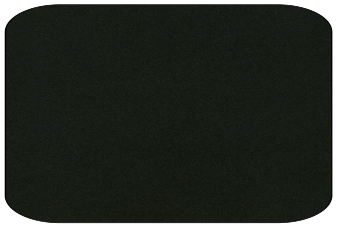
SL4878 Silver Grid

SL7921 Walnut Wonder

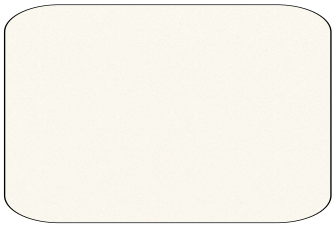
SL4674 Shadowed Savannah

SLD97 Vapor Veil

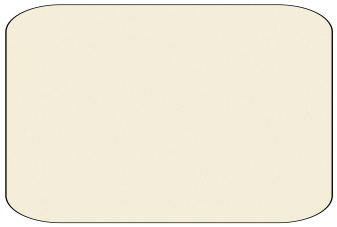
SL4623 Carbon Galaxy



SL1595 Black



SL1573 Frosty White



SLD30 Natural Almond

D381 Fashion Grey

SL837 Graphite

Colors representation may vary from final product. Please view material samples prior to selection. Multi-color projects require minimum quantities.

Phenolic - Quick Ship Color Chart

LOCKERS™

MANUFACTURING any design. any material. any technology.

P.O. Box 208
Como, MS 38619
662-338-4340
www.lockersmfg.com

LOCKERS™

any design. any material. any technology.

P.O. Box 208
Como, MS 38619
Phone: (662)-338-4340
Email: sales@lockersmfg.com

Lifetime Warranty

Date:
To:
Re:

The Lockers provided by Lockers Manufacturing for this project have an original purchaser Lifetime Warranty against defects in material and workmanship. This warranty is in effect from the date of substantial completion and excludes locks, or any other product not manufactured by LockersMFG.

Rapid deterioration of the finish will be covered. The warranty will NOT cover the following:

- Finished surfaces exposed to high humidity, chlorine salts, abrasives, acids, or other harmful chemicals.
- Improper use or abuse. Improper use or abuse includes, but is not limited to, damage from mishandling of the product, damage from excessive heat or uneven exposure to weather conditions, physical or chemical abuse and damage from improper care and maintenance.
- Modifications or attachments to the product that are not approved by LockersMFG.
- Products that were not installed, used or maintained in accordance with product instructions and warnings.
- Impact of foreign objects, fire, earthquake, flood, hurricane, tornado or any other casualty.

Any replacement or repair of material under this warranty shall be performed only after written authorization by LockersMFG and will constitute the buyers sole and exclusive remedy. In no event should LockersMFG be held responsible for any special, direct, indirect, incidental or consequential damages.

LOCKERS™

Manufacturing. any design. any material. any technology.

PO Box 208 Como, MS 38619

LEED® CONTRIBUTION REQUIREMENTS CERTIFICATION

(a) LockersMFG certifies that each "end product", produced in collaboration with our trusted licensing partner has three LEED® Version 2.2 certifications in accordance with the U.S. Green Building Council (USGBC), LEED® Green Building Rating System for New Construction.

(b) LockersMFG gaurantees that each "end product" produced in collaboration with our trusted licensing partner will contribute to the Project s LEED® requirements that are listed below.

LEED® Version 2.2	MR Credit
Construction Waste Management	Credit 2.1 and 2.2
Recycled Content	Credit 4.1 and 4.2
Regional Materials	Credit 5.1 and 5.2

LockersMFG in collaboration with our trusted licensing partner complies with all of the listed U.S. Green Building Council (USGBC), LEED® Green Building Rating System for New Construction (LEED-NC version 2.2) provisions.

Sincerly,
LockersMFG, LLC

Date: _____
Signature: _____
Company: _____
Name: _____
Title: _____

LOCKERS™

Manufacturing. any design. any material. any technology.

PO Box 208 Como, MS 38619

Build America, Buy America Act Certificate

(a) LockersMFG certifies that each "end product", except those listed in paragraph (b) of this provision, is a domestic "end product" and that for other than COTS items, and has considered components of unknown origin to have been mined, produced, or manufactured outside the United States. LockersMFG lockers are produced domestically and shall list as foreign "end products" those "end products" manufactured in the United States that do not qualify as domestic "end products", i.e., an end product that is not a COTS item and does not meet the component test in paragraph (2) of the definition of "domestic end product." The terms "commercially available off-the-shelf (COTS) item," "component," "domestic end product," "end product," "foreign end product," and "United States" are defined in the clause of this solicitation entitled "Buy American Act—Supplies."

A manufactured product qualifies as a domestic end product if it is manufactured in the US; and the cost of its components mined, produced, or manufactured in the US exceeds 65% of the cost of all of its components (48 C.F.R. § 25.101(a) as amended per Fed.Reg.)

Due to the shortage or non-existent domestic supply, some or all of the following materials may be sourced from international markets when not practicably available domestically.

(b) Foreign End Products:

Line Item	Country of Origin
Combination Locks	Varies
Channel Glides	Varies
Hooks	Varies
Pedestals	Varies

LockersMFG complies with the updated provisions of the Public Law 117-58 (as enacted March 9, 2024) applying graduating levels for the Buy American Act 41 U.S.C.A. 10 (2009) et. seq. and appreciates your interest in our products.

Sincerely, Lockers Manufacturing, LLC

As a bidder or offeror, we hereby certify that we will comply with the requirements of 49 U.S.C. 5323(j)(1), and the applicable regulations in 49 CFR part 661.

Date: _____
Signature: _____
Company: _____
Name: _____
Title: _____

INNOVATIVE STORAGE SOLUTIONS

The First Brand of Choice for all Architectural Specifications

LOCKERS™

MANUFACTURING any design. any material. any technology.

BUSINESS BROCHURE 2025

662-338-4340

WWW.LOCKERSMFG.COM

VISION - MISSION - MOTTO.

Our Vision

To enhance community safety by delivering innovative custom products and services that protect, secure and store personal belongings and company assets, effectively safeguarding against threats and losses.

Our Mission

To create security storage solutions through the capabilities of any design, any material, any technology.

Our Motto

KEEP ADVANCING!

Tons of lockers produced.

1370+

ON - TIME

98.4%

STANDARD COLORS

20

CUSTOM COLORS AVAILABLE

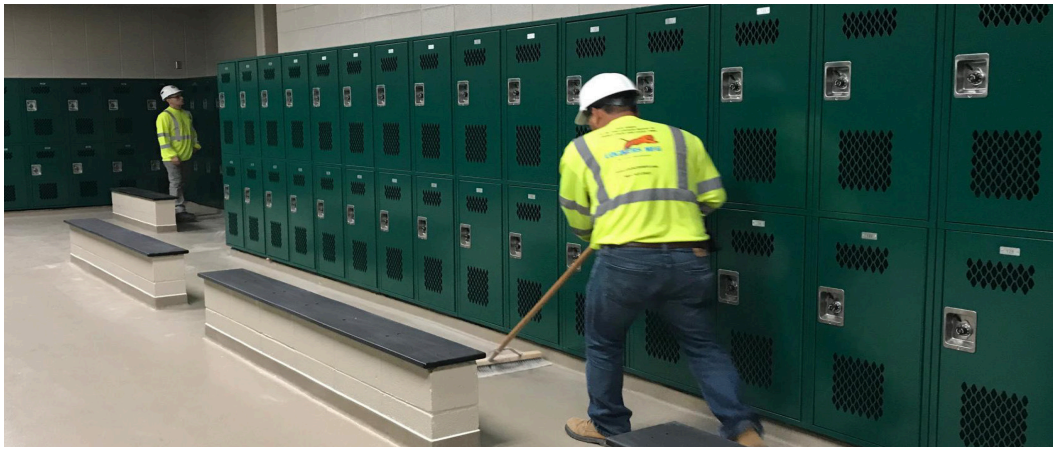
LOCKER OPENINGS

253K +

LIFETIME

WARRANTY

ABOUT US.



"WE MAKE RELIABLE LOCKERS, BACKED BY OUR LIFETIME WARRANTY, BUILT WITH YOUR SPECIFICATION IN MIND"

Lockers Manufacturing produces over 1,300 tons of metal lockers annually, and we are continuously expanding to meet growing demands. We believe no customer should have to settle for standard locker configurations from a spec book. At Lockers Manufacturing, we customize lockers to fit your specific needs.

Our Tagline: Any Design. Any Material. Any Technology.

While metal lockers are our main product line, we also specialize in high-quality HDPE, wood, plastic laminate, and phenolic lockers. Additionally, we offer innovative smart locker solutions to cater to the modern storage requirements.

Our Commitment to You:

Responsive Service: We prioritize being attentive and responsive to our customers' needs.

Value and Budget: We understand the importance of maximizing budget dollars, ensuring our products provide exceptional value.

Lifetime Warranty: We back our extensive product line with a comprehensive lifetime warranty, reflecting our confidence in the durability and reliability of our products.

Choose Lockers Manufacturing for customized, reliable, and innovative locker solutions that cater to your every requirement.

HARD FACTS

90%+

RECYCLED CONTENT

LOCKERS MANUFACTURING METAL LOCKERS CONTAIN MORE THAN 90% RECYCLED CONTENT. STEEL IS ALMOST INFINITELY RECYCLABLE

HISTORY.

7 Year Trajectory of Lockers Manufacturing

Lockers Manufacturing was founded in 2014. Our vision is to become the brand of choice in all architectural specifications for metal lockers. Lockers Manufacturing produces lockers specific to each customer's needs. Our professionals can also show ways to retain quality and save money.

2014

OUR FOUNDATION

Lockers Manufacturing is a private locker manufacturing company that was founded in 2014. Lockers Manufacturing began by producing lockers and selling them directly to Fortune 500 Companies.

- Creating a vision for a new kind of locker company.
- Birth of a team dedicated to providing the type of locker customers want.

2014-2015

BEGIN EVOLUTION

Lockers Manufacturing grows thru direct sales to Fortune 500 companies. Lockers Manufacturing begins to create a full catalog of different locker designs.

- Begins delivering quality metal lockers to our customers.
- Our plan requires continuous training, hiring of motiviated quality employees.

2016-2017

RESELLER PROGRAM

In 2016 Lockers Manufacturing grows past exclusive sales to Fortune 500 companies. Lockers Manufacturing begins a regional sales and marketing program thru dealers to end users.

- LockersMFG begins identifying Division 10 companies that fit our corporate vision.
- Our resellers are vetted to ensure they comply with our levels of quality installation and service.

Are you seeking durable lockers crafted by a company that truly listens to your needs? Look no further than Lockers Manufacturing. We build each locker to our customers' exact specifications, ensuring a perfect fit for your requirements.

2017-2018

ARCHITECTURAL SPECS

In 2017, Lockers Manufacturing begins to focus marketing efforts aimed at architecture firms. The goal is to see our products specified, approved as equal, and used as basis of design any place where lockers are needed. We want to partner with great architectural design firms and see our lockers in all projects across America.

- Lockers Manufacturing meets or exceeds all standard specifications for lockers.
- Lockers Manufacturing can customize any aspect o the locker construction to meet specification or create a new specification for your next project.

2018

CONTINUED GROWTH

Lockers Manufacturing expands operations by moving into newly renovated office space in Germantown, TN. The larger space helps our sales and marketing teams operate more efficiently. Later in 2018, Lockers Manufacturing purchases a 50,000 square foot facility in Piperton, TN, for warehousing and manufacturing purposes.

- Through hard work and market acceptance and adoption, Lockers Manufacturing continues to rapidly grow.
- One of our key strategies is to take our products nationwide. Look for Lockers Manufacturing to be included in more projects across America

2019-NOW

BECOME THE BEST

Lockers Manufacturing continues to employ an aggressive strategy for growth. Our American Made line of lockers are high quality, back by our Lifetime Warranty. Lockers Manufacturing uses premium cold rolled steel and superior manufacturing techniques to deliver durable long lasting lockers.

- As Lockers Manufacturing grows, we look to add to our product lines and provide our customers more value.
- We now have options for every budget and purchasing requirement.

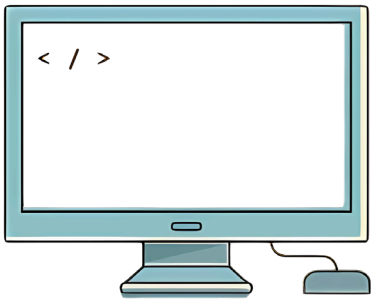
1. WE WANT TO EXCEED EVERY STANDARD OF EXCELLENCE OUR CUSTOMERS EXPECT

Since 2014 LOCKERS MANUFACTURING has worked hard to create reliable, timeless lockers that our customer desire. Our ability to understand the customer's needs, create a responsive design, and deliver the finished product on time, has established our company as a PREMIER locker manufacturer. From our start supplying needed lockers to Fortune 500's to our sustained growth in the architectural specification market, LOCKERS MANUFACTURING has established its reputation as a reliable company with employees dedicated to providing the highest quality lockers to our customers.

LOCKERS MANUFACTURING PROVIDES BETTER SERVICE FOR YOU!

- We can match custom color if one of our 20 standard colors aren't enough.
- We can provide custom interior fitout. Multiple hooks, double prong hooks, coat rods, multiple shelves, plastic locker bottoms, and more.
- Choice of multi-point latch, single-point latch, or door pull.
- Ventilation options: full louvers, standard louvers, mini louvers, diamond perforations, rectangular perforations, or solid.
- Our in-house CAD department completes all submittal drawing packages quickly. We can address any change requests as well.
- Lockers Manufacturing is committed to listening to your specific needs.
- Lockers Manufacturing can provide samples as needed.

2. YOU DESERVE LOCKERS MADE TO YOUR EXACT SPECIFICATIONS

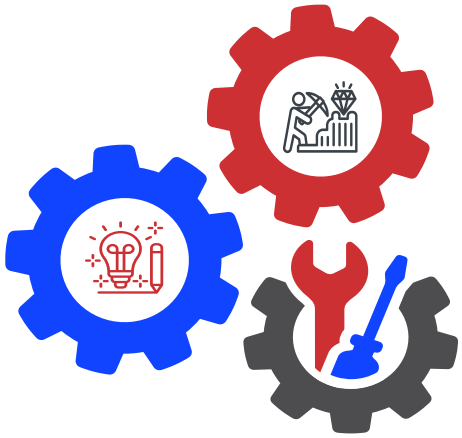


As we have grown into the spec locker market, LOCKERS MANUFACTURING has seen the customers' needs are not always met. Notably, in the traditional specification marketplace, the spec is first and the customer second. LOCKERS MANUFACTURING believes in a better way. Give the customer what they need. Customize, if necessary, the constuction of the locker to provide customers with the exact features they require. Furthermore, LOCKERS MANUFACTURING utilizes supply chain management to provide customized lockers at a very competitive price in the spec locker market.

3. LET'S BUILD A RELATIONSHIP

LOCKERS MANUFACTURING earns top reviews in the locker industry for our high standards of service and integrity. We ensure product satisfaction thru the usage of high quality cold rolled steel, industry leading 2 mil powder coating, and upgraded quiet locker operation features. A complete line of accessories are available for our lockers to provide a professional look to any locker installation.

OUR PHILOSOPHY.



ANY DESIGN

Lockers Manufacturing is blessed with experienced and talented designers.We can take your ideas and turn them into great lockers. It makes no difference if you are needing a custom interior fitout or a technological solution. Lockers Manufacturing has you covered.

ANY MATERIAL

Let a trained sales consultant at Lockers Manufacturing guide you in the selection of material for your locker. We can help you choose the durability of heavier gauge steel in our Heavy Duty or All-Welded products. Likewise we can discuss HDPE, Stainless Steel, or Wood construction benefits.

ANY TECHNOLOGY

LockersMFG can provide a Smart Locker solution that meets your needs. We have years of experience with lockers. Our trained consultants can explain to you our different options. We can provide custom hardware and software configurations to fulfill your Smart Locker needs.

CONSULTANT

Lockers Manufacturing believes that open communication is the key to success in every endeavor. Speak with one of our professional consultants to learn the reliable process we employ. Remember Lockers Manufacturing listens to your needs and designs a custom solution. We can connect you with one of our certified installers to provide a turn-key experience.

BUSINESS DEVELOPMENT.

2014	$31.2M	97	$1.6M
RELOCATED TO BATESVILLE, MS	IN ECONOMIC IMPACT GROWING TO	JOBS SUPPORTED & SUSTAINED GROWING TO	LOCAL, STATE & FEDERAL TAX IMPACT GROWING TO
2024	$345.4M	664 JOBS	$13.5M
GROUNDBREAKING BUILDING EXPANSION	IN 10 YEARS	IN 10 YEARS	IN 10 YEARS

"GREAT THINGS IN BUSINESS ARE NEVER DONE BY ONE PERSON; THEY'RE DONE BY A TEAM OF PEOPLE."

We would love for you to check out our brief economic impact report. Scan the QR code to view it now.

KEY OF SUCCESS.

> "SUCCESS IS CRAFTED THROUGH UNWAVERING DETERMINATION, RELENTLESS INNOVATION, COLLABORATIVE SYNERGY, AND THE ABILITY TO ADAPT AND THRIVE IN THE FACE OF CHANGE."

At Lockers Manufacturing, our commitment to success is built on the foundations of determination, innovation, collaboration, and adaptability. These keys to success drive us to deliver exceptional storage solutions, continually improve our products, and foster a collaborative environment where our team and clients thrive together. By embracing these principles, we ensure the highest standards of quality and customer satisfaction.

DETERMINATION

Maintain unwavering commitment to our goals, pushing through challenges and setbacks with resilience and perseverance.

INNOVATION

Embrace new ideas and technologies, continuously seeking ways to improve processes and create value.

COLLABORATION

Foster effective teamwork by leveraging the diverse skills, knowledge, and perspectives of others to achieve common objectives.

ADAPTABILITY

Stay flexible and responsive to change, turning obstacles into opportunities for growth and advancement.

LOCKERS™

MANUFACTURING any design. any material. any technology.

2025

THANK YOU

FOR YOUR BUSINESS

P : 662-338-4340
M : sales@lockersmfg.com
A : P.O. Box 208 Como, MS 38619