MAINE TURNPIKE AUTHORITY

ADDENDUM NO. 2

CONTRACT 2026.07

CROSBY MAINTENANCE OFFICE BUILDING

The bid opening date is December 9, 2025 at 11:00 A.M.

A pre-bid conference was held on November 4, 2025 at 10:00 A.M. at Maine Turnpike Authority.

The following changes are made to the Proposal, Specifications and Plans. Refer to the Questions section for additional information.

GENERAL

All questions regarding Contract 2026.07 should be submitted by Noon on December 2, 2025 to be answered by Addendum on or before December 4, 2025. Questions received after that time may not be answered.

PROPOSAL

• Intentionally left blank.

SPECIFICATIONS

The following specification sections have been issued with this Addendum:

- 012100 – Allowances
- 101400 - Signage

The following specification sections have been revised and reissued with this Addendum:

- Table of Contents
- Schedule of Bid Prices
- Section 403 – Hot Mix Asphalt Pavement
- Section 670 – Septic System
- 061753 -Shop-Fabricated Wood Trusses
- 084113 – Aluminum-Framed Entrances and Storefronts
- 260543 – Underground Ducts and Raceways for Electrical Systems

PLANS

Please make the following changes:

1. DRAWING A20-1 – EXTERIOR ELEVATIONS
    a. EXTERIOR MATERIALS LEGEND make the following changes:
        1. Material # 04A, Change MFR/COLOR to read “MORIN BRICK: ACADEMY SMOOTH NARROW FLASH RANGE”.

2. Material # 04B, Change MFR/COLOR to read “MORIN BRICK: WOODLAND SMOOTH NARROW FLASH RANGE”.

2. DRAWING A20-2 – EXTERIOR ELEVATIONS
   a. EXTERIOR MATERIALS LEGEND make the following changes:
      1. Material # 04A, Change MFR/COLOR to read “MORIN BRICK: ACADEMY SMOOTH NARROW FLASH RANGE”.
      2. Material # 04B, Change MFR/COLOR to read “MORIN BRICK: WOODLAND SMOOTH NARROW FLASH RANGE”.

The following drawings have been revised and reissued with this Addendum:

1. DRAWING C50-1 – SITE DETAILS
2. DRAWING C50-2 – SITE DETAILS
3. DRAWING A40-1 – PARTITION LEGEND AND DETAILS
3. DRAWING A50-3 - EXTERIOR DETAILS
4. DRAWING M50-7 - DETAILS
5. DRAWING M50-9 – DETAILS
6. DRAWING E70-2 – DETAILS

QUESTIONS

The following are questions submitted to the Maine Turnpike Authority in writing. Answers to the questions are noted. Bidders shall utilize this information in preparing their bid.

Question 8: The exterior wall configurations have multiple issues. Wall Types W01 and W02 - 2 x 6" Framing. Wall Types W11 and W12 - 2 x 8" Framing. All are drawn and described with 3-1/2" "Batt Insulation" in the cavities. If the cavities of exterior assemblies are insulated with "air permeable insulation", the cavity insulation should be in contact with all surfaces of the cavity and thus need to be a full cavity fill. Please advise.

Answer: **See revised drawings issued with this Addendum.**

1. The Thermal Insulation Specifications at 072100 include both Fiberglass and Mineral Wool Batts. Which type of Batt Insulation material is to be quoted for the Exterior Wall Cavities?

Answer: **Fiberglass Blanket Batt Insulation is intended for thermal insulation; Mineral Wool Batt Insulation is intended for fire-resistive insulation.**

2. The Thermal Insulation Specifications at 072100 list a 6 Mil Poly Vapor Barrier. However, there is no Poly Vapor Barrier drawn or listed at the interior of the Exterior Wall assemblies. If intended to have a Vapor Retarder at the interior of the walls, it should be 4 Mil Poly or a Smart Vapor Retarder such as CertainTeed Membrain. This would prevent creating a double vapor barrier in conjunction with the Rigid Insulation and the

Self-Adhered Air and Vapor Membrane which is drawn and listed at the exterior of the sheathing. Please advise.

Answer: **See revision to specification issued as part of this Addendum.**

3. Interior Partitions - All call for "Sound Attenuation Batts" As defined in the Gypsum Wall Board Specs at 092110 / 2.6 / D Acoustic Insulation, Sound Attenuation (Batts) Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool. Which material is to be quoted for Sound
Attenuation Batts? Fiberglass or Mineral Wool? Please advise.

Answer: **See revision to specification issued as part of this Addendum**.

Question 9: I am looking at this storefront portion and the drawings refer to both front set storefront and a SSG curtainwall system but the specifications call out center set storefront and no other references to curtain wall or front set can you advise what will be the accepted storefront product on this job?

Answer: **See specification 084113 ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS reissued with this Addendum.**

Question 10: I don't see the Captiveaire DOAS unit show on the drawings but it is scheduled on M50-7. Please advise.

Answer: **This unit was removed from the project. See revised mechanical plans M50-7 and M50-9 issued with this Addendum.**

Question 11: Is there a geotechnical report available for the Crosby Maintenance Office?

Answer: **The geotechnical report is on the MTA website.** **https://www.maineturnpike.com/projects/construction-contracts/crosby-maintenance-office-building**

Question 12: Drawing A20-2 Exterior Elevations in the Exterior Materials Legend Item 10A is saying 8" Aluminum Text will be by Allowance. Can you state what that allowance needs to be?

Answer: **See Specification Sections 012100 - ALLOWANCES, and Specification Section 101400 -SIGNAGE issued with this Addendum.**

Question 13: Specifications in Special Provision Section 203 Excavation and Embankment is referencing a Geotechnical Report. I cannot find it in the bid documents. Can this report be included?

Answer: **The geotechnical report is on the MTA website.** **https://www.maineturnpike.com/projects/construction-contracts/crosby-maintenance-office-building**

Question 14: Regarding the septic system. On sheet C-90-1 it shows a detail for a duplex 5' pump station with a 4' galvanized steel hatch. But then in the specs Special Provisions 670 Septic System it talks about a 4' single pump station with a regular cover. Which one is correct?

Answer: **The detail is correct. See revised specification section issued with this Addendum.**

Question 15: In the same Septic System Spec has this paragraph below. Can they clarify what they are talking about?

> The work shall also include the application of a Clear Protective Coating for Concrete Surfaces to the top and vertical surfaces of the concrete slab prior to backfilling and paving. All joints shall be watertight and sealed with Tylox superseal rubber gasket or equivalent. Layout design and Shop Drawings for the Holding Tank shall be completed, submitted to, and accepted by the Resident or the MTA prior to any work being completed relative to this section.

Answer: **See revised specification section issued with this Addendum.**

Question 16: Please define cable requirements for open triangles, split triangles (AV), and WAP locations are these all to be single CAT 6A locations, it is assumed wall phone to be a single CAT 6A.

Answer: **Assume 2 data drops per open and split triangle location (typical data outlets and A/V outlets) and one drop for wall phones.**

Question 17: It is assumed the proposed IT room will be A105, please clarify what is required in this room for CAT 6A termination? Should there be a rack if so what style and size, or should this just be a wall mounted patch panel? If a rack is required should vertical and horizontal cable management be provided?

Answer: **Correct, the data closet will be A105. See specifications for patch panel requirements in this location. Cable management is at the discretion of the installer. Cable trays are not required.**

Question 18: Where will the riser path be for the Category 6A to the proposed second floor outlet, or will this be fed from the ceiling below?

Answer: **It is recommended to feed this from the ceiling below.**

Question 19: Spec states modular patch panels do you want the panel fully populated with jacks or have jacks for cable installed only?

Answer: **Yes, please provide a fully populated panel with jacks. A complete and working system is to be provided.**

Question 20: Spec states 36" patch cords, are these required? If so will this be one for each Category 6A cable installed? Is this the only length required? Is any patching or racking of equipment required?

Answer: **Yes, 36" patch cords are required. Assume one for each cable installed. At this time the length noted is the only one required. Include patch panel. Please provide a complete and working system.**

Question 21: Should the LV contractor plan to install customer provided access points?

Answer: **Yes.**

Question 22: I was getting ready to quote a Weinman for the Hydronic Pumps, but I do not see a design point (X gpm @ X TDH) within the spec. Is there any way we can get that information?

Answer: **Provide pump performance as indicated on M60-2.**

ATTACHMENTS

- (This document - Addendum #2 (6 pages)
- Specification Section Table of Contents (4 pages)
- Specification Section Schedule of Bid Prices (10 pages)
- Special Provision Specification Section 403 – Hot Mix Asphalt Pavement (2 pages)
- Special Provision Specification Section 670 – Septic System (4 pages)
- Specification Section 012100 – Allowances (3 pages)
- Specification Section 061753 – Shop-Fabricated Wood Trusses (6 pages)
- Specification Section 084113 – Aluminum Framed Entrances (16 pages)
- Specification Section 101400 – Signage (2 pages)
- Specification Section 260543 – Underground Ducts and Raceways for Electrical Systems (16 pages)
- Drawing C50-1 – SITE DETAILS (1 page)
- Drawing C50-2 – SITE DETAILS (1 page)
- Drawing A40-1 – PARTITION LEGEND AND DETAILS (1 page)
- Drawing A50-3 - EXTERIOR DETAILS (1 page)
- Drawing M50-7 – DETAILS (1 page)
- Drawing M50-9 – DETAILS (1 page)
- Drawing E70-2 – DETAILS (1 page)

Notes: The above items shall be considered as part of the bid submittal.
The total number of pages included in this addendum is seventy-six (76) pages.
All bidders are requested to acknowledge the receipt of the Addendum No. 2 by signing below and email this sheet to Nathaniel Carll, Purchasing Department, Maine Turnpike Authority at ncarll@maineturnpike.com Bidders are also required to acknowledge receipt of this Addendum No. 1 on Page P-9 of the bid package.

_____
Business Name

_____
Print Name and Title

_____
Signature

_____
Date

Very truly

yours,
MAINE TURNPIKE AUTHORITY

_____
Nathaniel Carll
Purchasing Department
Maine Turnpike
Authority

MAINE TURNPIKE AUTHORITY
CROSBY MAINTENANCE BUILDING
CONTRACT 2026.07

TABLE OF CONTENTS

This Page Intentionally Left Blank

MAINE TURNPIKE AUTHORITY

PROPOSAL

CONTRACT 2026.07

CROSBY MAINTENANCE OFFICE BUILDING

TO MAINE TURNPIKE AUTHORITY:

The work consists of the following:

1. Construction of an approximate 6,000 square foot wood-framed building consisting of offices, a crew room with kitchenette, locker and toilet rooms.

2. Construction includes, but is not necessarily limited to, the following:
   The work includes all building structure, mechanical, electrical, and plumbing, as well as all site work, grading, pavement, lighting, utilities, and all other work incidental thereto in accordance with the Plans and Specifications.

3. Construction of reinforced concrete footings, piers, foundation walls, and slabs-on-grade including exterior concrete aprons and entry foundation/slab systems.

4. Construction of the building proper, including all equipment and interior and exterior finishes.

5. Furnishing and installing plumbing, heating, and electrical, complete with all appurtenances and accessories.

6. Coordinating with the utility to provide transformers and connections.

7. Coordinating with the utility to relocate existing underground power and telecom connections to the Police Garage located on the campus, to overhead lines include new poles, service drops to underground conduit and wire, and new underground manholes with spliced connections.

This Work will be done under a Contract known as Contract 2026.07 according to the Plans and Specifications which are on file in the office of the Maine Turnpike Authority, 2360 Congress Street, Portland, Maine.

On the acceptance of this Proposal for said Work, the undersigned will give the required bond with good security conditioned for the faithful performance of said Work, according to said Plans and Specifications, and the doing of all other work required by said Specifications for the consideration herein named and with the further condition that the Maine Turnpike Authority shall be saved harmless from any and all damages that might accrue to any person, persons or property by reason of the carrying out of said Work, or any part thereof, or by reason of negligence of the undersigned, or any person or persons under his employment and engaged in said Work.

The undersigned hereby declares that he/she has carefully examined the Plans, Specifications and other Contract Documents, and that he/she will contract to carry out and complete the said Work as specified and delineated at the price per unit of measure for each scheduled item of Work stated in the Schedule of Prices as follows:

It is understood that the TOTAL AMOUNT stated by the undersigned in the following Schedule of Prices is based on approximate quantities and will be used solely for the comparison of bids, and that the quantities stated in the Schedule of Prices for the various items are estimates only and may be increased or decreased all as provided in the Specifications.

SCHEDULE OF BID PRICES
CONTRACT NO. 2026.07
CROSBY MAINTENANCE OFFICE BUILDING

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
202.203	**PAVEMENT BUTT JOINT**	**SY**	**75**				
202.81	REMOVING STRUCTURES AND OBSTRUCTIONS	Lump Sum	1				
203.20	**COMMON EXCAVATION**	**Cubic Yard**	**3,350**				
203.25	GRANULAR BORROW	Cubic Yard	300				
203.2312	HEALTH AND SAFETY PLAN	Lump Sum	1				
203.2333	DISPOSAL AND TREATMENT OF SPECIAL EXCAVATION	Ton	50				
203.234	TREATMENT OR DISPOSAL OF CONTAMINATED GROUNDWATER	Gallon	500				
203.35	CRUSHED STONE 3/4 INCH	Cubic Yard	150				
304.10	AGGREGATE SUBBASE COURSE - GRAVEL	Cubic Yard	1,100				
304.105	STRUCTURAL FILL	Cubic Yard	1,475				
304.14	AGGREGATE BASE COURSE - TYPE A	Cubic Yard	550				

CARRIED FORWARD:

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
BROUGHT FORWARD:							
403.207	HOT MIX ASPHALT - 19.0 MM NOMINAL MAXIMUM SIZE	Ton	350				
403.208	HOT MIX ASPHALT - 12.5 MM NOMINAL MAXIMUM SIZE	Ton	200				
403.209	HOT MIX ASPHALT - 9.5 MM NOMINAL MAXIMUM SIZE	Ton	50				
409.15	BITUMINOUS TACK COAT RS-1 OR RS1h - APPLIED	Gallon	375				
419.30	**SAWCUT AND MILLING BITUMINOUS PAVEMENT**	Linear Foot	**375**				
502.701	CONCRETE EQUIPMENT PAD	Each	1				
502.702	CONCRETE PROPANE TANK PAD	Each	1				
604.15	MANHOLE	Each	1				
604.16	**HEAVY DUTY PRECAST JUNCTION BOX/HANDHOLE**	**Each**	**5**				
604.151	MANHOLE COVER 57" INTERIOR DIAMETER	Each	1				
604.158	UTILITY VAULT - 4' X 6'	Each	2				
605.072	4 INCH PERFORATED SDR-35 UNDERDRAIN	Linear Foot	375				

CARRIED FORWARD:

606.356	UNDERDRAIN DELINEATOR POST	Each	1		

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
BROUGHT FORWARD:							
609.11	**VERTICAL GRANITE CURB, TYPE 1**	**Linear Foot**	**135**				
615.07	LOAM	Cubic Yard	325				
618.14	SEEDING METHOD NUMBER 2	Unit	17				
619.1201	MULCH - PLAN QUANTITY	Unit	17				
619.1202	TEMPORARY MULCH	Lump Sum	1				
620.58	EROSION CONTROL GEOTEXTILE	Square Yard	1,800				
629.05	HAND LABOR, STRAIGHT TIME	Hour	40				
631.12	ALL PURPOSE EXCAVATOR (INCLUDING OPERATOR)	Hour	40				
631.172	TRUCK-LARGE (INCLUDING OPERATOR)	Hour	40				
631.221	SMALL FRONT END LOADER (INCLUDING OPERATOR)	Hour	20				
631.36	FOREMAN	Hour	20				

CARRIED FORWARD:

633.031	PROPANE SERVICE	Lump Sum	1		
634.1943	4" SCHEDULE 80 PVC CONDUIT	Linear Foot	125		

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
BROUGHT FORWARD:							
634.1945	2" SCHEDULE 80 PVC CONDUIT	Linear Foot	925				
634.1946	3" SCHEDULE 80 PVC CONDUIT	Linear Foot	350				
634.3122	#2/0 COPPER WIRE - 12 KV RATED (4 WIRE)	Linear Foot	275				
634.3152	#4 GND WIRE	Linear Foot	275				
634.3153	#6 GND WIRE	Linear Foot	125				
				CARRIED FORWARD:			

634.3335	MANHOLE - FIBER OPTIC - STANDARD	Each	1		
639.19	FIELD OFFICE - TYPE B	Each	1		
656.656	EROSION CONTROL FILTER BERM	Cubic Yard	250		
659.1	MOBILIZATION	Lump Sum	1		
670.10	SUBSURFACE WASTEWATER DISPOSAL SYSTEM	Lump Sum	1		
800.01	CROSBY MAINTENANCE BUILDING	Lump Sum	1		
801.14	4 INCH PVC SANITARY SEWER	Linear Foot	15		

CARRIED FORWARD:

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
BROUGHT FORWARD:							
822.322	6 INCH CLASS 52 DUCTILE IRON WATER MAIN	Linear Foot	30				
822.34	8 INCH CLASS 52 DUCTILE IRON WATER MAIN	Linear Foot	500				
823.325	8 INCH GATE VALVE	Each	5				
823.331	6 INCH GATE VALVE	Each	1				
824.32	**REMOVE/RESET HYDRANT**	**Each**	**1**				
825.4222	2 INCH GATE VALVE QITH BOX	Each	3				
825.4222	2 INCH HDPE CTS	Linear Foot	250				
825.4311	1 1/2 INCH HDPE CTS	Linear Foot	75				
TOTAL:							

Acknowledgment is hereby made of the following Addenda received since issuance of the Plans and Specifications: _____

_____

_____

Accompanying this Proposal is an original bid bond, cashiers or certified check on _____ Bank, for _____, payable to the Maine Turnpike Authority. In case this Proposal shall be accepted by the Maine Turnpike Authority and the undersigned should fail to execute a Contract with, and furnish the security required by the Maine Turnpike Authority as set forth in the Specifications, within the time fixed therein, an amount of money equal to Five (5%) Percent of the Total Amount of the Proposal for the Contract awarded to the undersigned, but not less than $500.00, obtained out of the original bid bond, cashier's or certified check, shall become the property of the Maine Turnpike Authority; otherwise the check will be returned to the undersigned.

The performance of said Work under this Contract will be completed during the time specified in Subsection 107.1.

It is agreed that time is of the essence of this Contract and that I (we) will, in the event of my (our) failure to complete the Work within the time limit named above, pay to Maine Turnpike Authority liquidated damages in the amount or amounts stated in the Specifications.

The undersigned is an Individual/Partnership/Corporation under the laws of the State of _____, having principal office at _____, thereunto duly authorized.

_____ *(SEAL)*

_____ *(SEAL)*

Affix Corporate Seal
or Power of Attorney
Where Applicable

_____ *(SEAL)*

By: _____

Its: _____

Information below to be typed or printed where applicable:

INDIVIDUAL:

(Name)	(Address)

PARTNERSHIP - Name and Address of General Partners:

(Name)	(Address)
(Name)	(Address)
(Name)	(Address)
(Name)	(Address)

INCORPORATED COMPANY:

(President)	(Address)
(Vice-President)	(Address)
(Secretary)	(Address)
(Treasurer)	(Address)

-

SPECIAL PROVISION

SECTION 403

HOT MIX ASPHALT PAVEMENT

Project Pavement

Full Depth and Trenches

Course	HMA Grading	Item Number	Total Thickness	No. of Layers	Complimentary Notes
Base	**19.0mm**	**403.207**	**2 ½"**	**1**	**C,I**
Wearing	**12.5mm**	**403.208**	**1 ½"**	**1**	**C,I**

Sidewalks

Course	HMA Grading	Item Number	Total Thickness	No. of Layers	Complimentary Notes
Base	**4.75mm**	**403.212**	**½"**	**1**	**C,I**
Wearing	**12.5mm**	**403.208**	**1 ½"**	**1**	**C,I**
Incidentals	**9.5mm**	**403.209**	**2"**	**2**	**C,I,L**

COMPLEMENTARY NOTES

A. The required PGAB for this mixture shall be **64E-28.**

B. RAP may not be used.

C. The Maine DOT will conduct the job mix verification. The aggregate qualities shall meet the design traffic level of 3 to <10 million ESALS for mix placed under this contract. Minimum and Maximum PGAB content limits from 401.21 shall not apply.

D. The MTA will conduct the job mix verification. The aggregate qualities shall meet the design traffic level of 10 to <30 million ESALS for mix placed under this contract. The design verification, Quality Control, and Acceptance tests for this mix will be performed at **75 gyrations**. (N design)

E. A material transfer vehicle (MTV) shall be used for the placement of Hot Mix Asphalt wearing surface on all roadways including acceleration and deceleration lanes and all ramps.

F. Joints shall be constructed as the "notched wedge" type in accordance with Subsection 401.17.

G. Joint density will be measured in accordance with Subsection 401.165.

H. PGAB shall conform to the provisions of 403.02 – Polymer Modified PGAB for HMA.

I. The contractor shall furnish a quality control technician equipped with an approved densometer to ensure density requirements are met.

J. Hydrated Lime shall be incorporated into the mixture.

K. The antistrip additive Zycotherm manufactured by Zydex Industries shall be incorporated into the PGAB at a rate of 0.1%.

L. Item 403.209, 9.5mm Hot Mix Asphalt (Incidentals) shall be places in two, 1” lifts.

SPECIAL PROVISION SECTION

670

SEPTIC SYSTEM

The following Section is added:

670.01 Description

This work shall consist of construction of subsurface sewage disposal system to serve the Crosby Maintenance Office Building. The work shall include furnishing and installing sanitary sewer piping, proprietary-type distribution system (piping, fittings, adapters, etc.), sewage pump and suitable fil1 materials. The work shall also include all testing and all other work necessary to complete the construction, all in accordance with these Specifications and as shown on Subsurface Wastewater Disposal System Application (Appendix E) or as directed by the Resident.

All materials, construction methods and details, and approvals shall conform to these Specifications, the Maine Subsurface Wastewater Disposal Rules, Maine Plumbing Code and all other applicable State and Local Laws and Ordinances.

Before beginning work, the Contractor shall verify that all site conditions and elevations that will have a bearing on the work are as shown on the Plans. If any discrepancies are found, the Contractor shall notify the Resident immediately.

Before any portion of the work can be backfilled, the Contractor shall make arrangements to have the Local Plumbing Inspector inspect the work. Backfilling shall proceed pursuant to approval of the work by the Local Plumbing Inspector.

Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all Project work.

The septic tank shall be H-20 rated \ consistent with the details presented in the contract Plans. The tank shall have a liquid capacity of at least 1,500 gallons and conform to the applicable requirements of ASTM C478. The tank shall be constructed of concrete with a minimum compressive strength of 5,000 psi at 28 days and use either wire fabric reinforcing meeting the requirements of ASTM A185 or deformed steel reinforcement meeting the requirements of ASTM A615. Reinforcing shall have a minimum yield strength of 40,000 psi.

The work shall also include the application of a Clear Protective Coating for Concrete Surfaces to the top and vertical surfaces of the concrete slab prior to backfilling and paving. All joints shall be watertight and sealed with Tylox superseal rubber gasket or equivalent. Layout design and Shop Drawings for the **Septic Tank** shall be completed, submitted to, and accepted by the Resident or the MTA prior to any work being completed relative to this section.

Septic tanks shall be located under the pavement as shown on the plans, and shall have risers and 30” manholes with rim elevations matching the adjacent elevations.

670.02 Submittals

Shop and working drawing submittals shall include details of all piping, pipe fittings, subsurface disposal system materials, precast concrete structures with risers and manhole and details of interfaces, connections, dimensions, layouts, and other pertinent data, including:

Certificates of Compliance for all pipe and precast concrete structures.

670.03 Materials

Gravity sewer pipe (solid) and fittings shall be four-inch PVC conforming to ASTM D1785, Schedule 40. Joints shall be integrally formed bell and spigot type, push-on joints conforming to ASTM D3139 with elastomeric gasket conforming to ASTM F477.

The frames and covers shall be 24" in diameter (See details in the plans) for the 1,500 gallon septic tank. The manhole shall be a Universal Model 98 — Multi-Purpose Manhole and cover or approved equal.

All frames and covers shall be cast iron conforming to the requirements of AASHTO M105 for Class No. 30 gray iron castings suitable for H-20 loading. Frames and covers shall be machined to ensure true bearing surfaces. Cover(s) for the septic tank shall be cast with the word "SEWER" on it. Frame flanges shall have a minimum four-inch width.

The **septic tank** shall be designed in accordance with the drawings shown in the plans or shall be an approved equal. Distribution piping, fittings, and adapters for the sewage disposal field shall be as an approved equal as determined by the Resident and as approved by the Rules.

The force main pipe and fittings shall be two-inch SDR 21 conforming to ASTM D2241 between the septic tank, sewage pump, and leach field.

670.04 Sewage Pump

The sewage duplex pumps shall be Goulds Pump Model 3885WE0511H - single phase (115V) 2" discharge pumps, with all the needed components for system operation. The pumps will be enclosed in a 4-foot diameter 6 foot deep effluent tank located directly downstream from the septic tank. The effluent tank shall contain a Conery BERS-0200 SST 316 Stainless Steel Base Elbow Rai1 System 2.00" X 2.00", with stainless steel rail guides and brackets for pump removal and maintenance. The effluent tank shall have a 30 inch diameter riser frame and manhole cover and shall conform to the Catch Basin Frames and Grates as outlined in the 604 SP and be manufactured by EJ Company of Brockton, Massachusetts or an approved equal and shall meet or exceed the AASHTO M306 Loading Requirements. The riser shall be installed to match the proposed adjacent parking lot installation.

The pump and control wiring shall be enclosed in a 1-inch schedule 80 conduit running from the effluent tank to a junction box affixed to the side of the office building. The pump and control wiring shall be spliced within this junction box and run to the control panel located in the office utility room. The control panel shall be an Ohio Electric Control individual discrete component control panel and shall be located in the Crosby Maintenance Office Building utility room.

670.05 Special Fill for Disposal Bed

Soi1 material needed for fill beneath, above, and adjacent to the system, including fill extensions, shall be a coarse sand to gravel and meet the requirements of the Maine Subsurface Wastewater Disposal Rules. Crushed stone beneath and adjacent to the chambers as shown on the Plan shall conform to the Rules. The Contractor, prior to bringing the stone and fil1 material on-site, shall submit a representative five-gallon bucket sample of the disposal bed material to the Resident for approval.

670.06 Insulation

Thermal insulation for the top of the chambers shall be rigid cellular polystyrene in accordance with ASTM C578, Type VII, a minimum two inches thick.

670.07 Bedding Material

Bedding material for pipe and structure subgrades shall be gravel borrow per Subsection 703.20 of the Standard Specifications, except that the largest size particle shall be two inches.

670.08 General Construction

Maintain all excavations in proper condition for carrying on the work, and perform all bailing, draining, or pumping as necessary to keep the excavation free of water.

It shall be the Contractor's responsibility to obtain all necessary permits and pay all fees at no additional cost to the Authority.

Excavation, bracing and sheeting for excavations, dewatering and backfilling shall conform to the requirements of Section 203, Excavation and Embankment, of the Standard Specifications. Trench widths shall be as shown on the Plans. Bedding for the pipes and structures shall be as shown on the Subsurface Wastewater Disposal System Application and as specified herein.

670.09 Excavation

Excavation for trenches and structures shall be as specified in Section 203, Excavation and Embankment, of the Standard Specifications.

Contractor shall provide adequate bracing and shoring of all excavations in accordance with the requirements of all governing codes and regulations.

All existing piping and structures exposed during excavation shall be adequately supported, braced, or otherwise protected during construction activities.

670.10 Backfilling

Backfill and compaction for trenches and structures shall be as specified in Subsection 206.03, Backfilling, of the Standard Specifications.

670.11 Disposal Bed

The disposal bed shall be constructed as detailed on the Subsurface Wastewater Disposal System Application, as defined by the "Rules". If unsuitable material is encountered and removed at and below the disposal bed surface, granular fi11 shall be placed and compacted to bring the grade up to the required bed elevation. The Local Plumbing Inspector shall inspect and approve the prepared disposal bed before placement of fi11 for the disposal bed. Coarse sand to gravel shall be placed below and adjacent to the stone surrounding the chambers as detailed on the Subsurface Wastewater Disposal System Application.

670.12 Installation of Pipe

Pipe and fittings shall be installed in conformance with ASTM D2321 and as detailed on the drawings and per manufacturer recommendations. Pipe shall be laid on a firm compacted gravel borrow foundation at the line and grade designated. A recess shall be excavated to receive the bell or coupling at each joint if necessary. The piping shall be jointed as specified by the manufacturer to form a watertight joint.

Immediately before laying any pipe, the interior surfaces and ends of sections of pipe shall be cleaned by wiping or other procedure, as necessary. All pipe shall be firmly bedded in the underlying soil for its entire length. Joints shall be watertight, adjoining sections of pipe shall form a continuous and smooth invert, spigots shall be fully entered, and the joints shall be slightly flexible. Broken or otherwise damaged pipe shall be replaced at the Contractor's own expense. Pipes shall be kept free

of any deposit or debris. The sewer pipe as laid shall be approved by the Resident before any trench is backfilled or embankment is placed.

Any pipe which is not in true alignment, or which shows any settlement after laying, shall be taken up and re-laid without additional cost to the Authority. Any cribbing or subgrade treatment necessary to prevent settlement shall be placed at the Contractor's own expense.

Any damage to the pipe or invert from any cause shall be promptly repaired by the Contractor at his own expense, before backfill is commenced or water passes through the pipe.

Wherever water piping must cross sewer piping, a vertical separation of 18 inches shall be maintained. In no case shall a water pipe cross under a sewer pipe.

670.13 Testing

Testing/acceptance procedures for the sanitary sewer system shall equal or exceed all state and local requirements.

In case leakage exceeds the above specified amount, the Contractor shall locate the leaks and shall repair them at his own expense. Pipelines with shear-type breaks, fishmouths or damaged gaskets, cracked bells or couplings, hairline fractures, or structural damage of any type shall be replaced in kind. Mechanical sleeve couplings poured concrete collars, or similar repairs are not permitted. The use of pressure grouting repair techniques will not be allowed without the written consent of the Resident.

After repairs have been made, the line shall be re-tested and the process of repairing and re-testing shall be repeated until results within the above specified limits are obtained.

670.14 Method of Measurement

All the Sewerage Disposal System work, including but not necessarily limited to, all labor, components, materials, equipment, and incidental work necessary for the satisfactory completion of the system will be measured for payment as a lump sum, complete and accepted.

670.15 Basis of Payment

Payment will be made for the accepted Sewerage Disposal System, including all excavation, bedding material, special fil1, pipes, fittings, septic tank, effluent pump tank, sewage pump, control panel and wiring, pump guide rail system, backfill, and associated work at the Contract lump sum price, which price shall be full compensation for all labor, materials, equipment and incidental work necessary for the satisfactory completion of the work.

Loam, seed and mulch placed on the completed and accepted sewage disposal system will be paid under their respective pay items.

Payment will be made under:

Pay Item		Pay Unit
670.11	Subsurface Wastewater Disposal System	Lump Sum

SECTION 012100 – ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements governing allowances for divisions 02 through 33.
   1. Certain items or work may be specified in the Contract Documents by allowances. Allowances established in lieu of actual requirements defer specific requirements to a later date when additional information is available for evaluation. If necessary, additional requirements will be issued by Change Order.

B. Types of allowances include the following:
   1. Lump-sum allowances.
   2. Quantity allowances.

C. Related Sections include the following:
   1. Divisions 02 through 33 Sections for items of Work covered by allowances.

1.3 SELECTION AND PURCHASE

A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.

B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

C. Purchase products and systems selected by Architect from the designated supplier.

1.4 SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

B. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.5 COORDINATION

A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.6 LUMP-SUM, AND QUANTITY ALLOWANCES

A. Allowance shall include cost to Contractor, and to filed sub-bidders of specific products and materials ordered by Owner under allowance less any applicable trade discounts, and shall include taxes, freight, and delivery to Project site, costs for receiving and handling at Project site, labor and installation.

B. Contractor's overhead and profit for allowances, including allowances carried in the filed sub-bidder bids, shall be included as part of the Contract Sum (base bid) and not part of the allowance. Filed sub-bidder's overhead and profit for allowances shall be included as part of the Contract Sum (filed sub base-bid) and not part of the allowance. The allowance amount will be adjusted by an add or deduct change order for the net difference without additional markup.

C. Quantity allowances shall be net quantities, and shall be adjusted by applicable unit cost or applicable specified measurement and payment procedures.

D. To adjust allowance amounts, prepare a Change Order proposal based on the difference between actual installed cost amount and the allowance.
   1. Include installation costs as part of the allowance.
   2. Submit documentation on supplier's and subcontractor's letterhead actual cost and quantities for associated allowances.

1.7 UNUSED MATERIALS

A. Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
   1. If requested by Architect, prepare unused material for storage by Owner when it is not economically practical to return the material for credit. If directed by Architect, deliver unused material to Owner's storage space. Otherwise, disposal of unused material is Contractor's responsibility.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF CASH ALLOWANCES

A. Allowance No. 1 – Interior and Exterior Building Signage: Include $20,000 for interior ADA signage, and exterior building signage.

B. Refer to Section 260010 Field Conditions – CMP electrical utility cash allowances. Allowances are to be included as part of the Electrical filed sub-bid base bid.

C. Refer to Section 270010 Coordination – Consolidated communications utility cash allowances. Allowances are to be included as part of the Electrical filed sub-bid base bid.

END OF SECTION 012100

SECTION 061753 - SHOP-FABRICATED WOOD TRUSSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
   1. Wood roof trusses.
   2. Wood girder trusses.

~~1.3 ALLOWANCES~~

~~A. Provide wood truss bracing under the Metal-Plate-Connected Truss Bracing Allowance as specified in Section 012100 "Allowances."~~

1.4 DEFINITIONS

A. Metal-Plate-Connected Wood Trusses: Planar structural units consisting of metal-plate-connected members fabricated from dimension lumber and cut and assembled before delivery to Project site.

1.5 ACTION SUBMITTALS

A. Product Data: For metal-plate connectors, metal truss accessories, and fasteners.

B. Shop Drawings: Show fabrication and installation details for trusses.
   1. Show location, pitch, span, camber, configuration, and spacing for each type of truss required.
   2. Indicate sizes, stress grades, and species of lumber.
   3. Indicate locations of permanent bracing required to prevent buckling of individual truss members due to design loads.
   4. Indicate locations, sizes, and materials for permanent bracing required to prevent buckling of individual truss members due to design loads.
   5. Indicate type, size, material, finish, design values, orientation, and location of metal connector plates.
   6. Show splice details and bearing details.

C. Delegated-Design Submittal: For metal-plate-connected wood trusses indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.6 INFORMATIONAL SUBMITTALS

A. Product Certificates: For metal-plate-connected wood trusses, signed by officer of truss-fabricating firm.

B. Evaluation Reports: For the following, from ICC-ES:
   1. Metal-plate connectors.
   2. Metal truss accessories.

1.7 QUALITY ASSURANCE

A. Metal Connector-Plate Manufacturer Qualifications: A manufacturer that is a member of TPI and that complies with quality-control procedures in TPI 1 for manufacture of connector plates.
   1. Manufacturer's responsibilities include providing professional engineering services needed to assume engineering responsibility.
   2. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.

B. Fabricator Qualifications: Shop that participates in a recognized quality-assurance program, complies with quality-control procedures in TPI 1, and involves third-party inspection by an independent testing and inspecting agency acceptable to Architect and authorities having jurisdiction.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Handle and store trusses to comply with recommendations in SBCA BCSI, "Building Component Safety Information: Guide to Good Practice for Handling, Installing, Restraining, & Bracing Metal Plate Connected Wood Trusses."
   1. Store trusses flat, off of ground, and adequately supported to prevent lateral bending.
   2. Protect trusses from weather by covering with waterproof sheeting, securely anchored.
   3. Provide for air circulation around stacks and under coverings.

B. Inspect trusses showing discoloration, corrosion, or other evidence of deterioration. Discard and replace trusses that are damaged or defective.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design metal-plate-connected wood trusses

B. Structural Performance: Metal-plate-connected wood trusses shall be capable of withstanding design loads within limits and under conditions indicated. Comply with requirements in TPI 1 unless more stringent requirements are specified below.
   1. Design Loads: As indicated.
   2. Maximum Deflection under Design Loads:
      a. Roof Trusses: Vertical deflection of 1/360 of span (1 ½” MAX).
      b. Gable End Trusses: Horizontal deflection of l/360 of span

C. Comply with applicable requirements and recommendations of TPI 1, TPI DSB, and SBCA BCSI.

D. Wood Structural Design Standard: Comply with applicable requirements in AF&PA's "National Design Specifications for Wood Construction" and its "Supplement."

2.2 DIMENSION LUMBER

A. Lumber: DOC PS 20 and applicable rules of any rules-writing agency certified by the American Lumber Standard Committee (ALSC) Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
   1. Factory mark each piece of lumber with grade stamp of grading agency.
   2. For exposed lumber indicated to receive a stained or natural finish, omit grade stamp and provide certificates of grade compliance issued by grading agency.
   3. Provide dressed lumber, S4S.
   4. Provide dry lumber with 19 percent maximum moisture content at time of dressing.

B. Minimum Chord Size for Roof Trusses: 2 by 6 inches nominal (38 by 140 mm actual) for both top and bottom chords unless noted otherwise

C. Minimum Specific Gravity for Top Chords: 0.50.

D. Permanent Bracing: Provide wood bracing that complies with requirements for miscellaneous lumber in Section 061000 "Rough Carpentry."

2.3 METAL CONNECTOR PLATES

A. General: Fabricate connector plates to comply with TPI 1.

B. Hot-Dip Galvanized-Steel Sheet: ASTM A 653/A 653M; Structural Steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G60 (Z180) coating designation; and not less than 0.036 inch (0.9 mm) thick.
   1. Use for interior locations unless otherwise indicated.

C. Stainless-Steel Sheet: ASTM A 666, Type 304 Type 316, and not less than 0.035 inch (0.88 mm) thick.
   1. Use for exterior locations and where indicated.

2.4 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
   1. Provide fasteners for use with metal framing anchors that comply with written recommendations of metal framing manufacturer.
   2. Where trusses are exposed to weather, in ground contact, made from pressure-preservative treated wood, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

B. Nails, Brads, and Staples: ASTM F 1667.

2.5 METAL FRAMING ANCHORS AND ACCESSORIES

A. Manufacturers: Subject to compliance with requirements, provide products by the following:
   1. Simpson Strong-Tie Co., Inc.

B. Allowable design loads, as published by manufacturer, shall comply with or exceed those of products of manufacturers listed. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency. Framing anchors shall be punched for fasteners adequate to withstand same loads as framing anchors.

C. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 (Z180) coating designation.
   1. Use for interior locations unless otherwise indicated.

D. Hot-Dip Heavy-Galvanized-Steel Sheet: ASTM A 653/A 653M; Structural Steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 (Z550) coating designation; and not less than 0.036 inch (0.9 mm) thick.
   1. Use for wood-preservative-treated lumber and where indicated.

E. Stainless-Steel Sheet: ASTM A 666, Type 304 Type 316.
   1. Use for exterior locations and where indicated.

F. Truss Tie-Downs: Bent strap tie for fastening roof trusses to wall studs below, 1-1/2 inches (38 mm) wide by 0.050 inch (1.3 mm) thick. Tie fastens to one side of truss, top plates, and side of stud below.

G. Truss Clips: Angle clips for bracing bottom chord of roof trusses and floor trusses at non-load-bearing walls, 1-1/4 inches wide by 0.050 inch thick. Clip is fastened to truss through slotted holes to allow for truss deflection.

H. Roof Truss Bracing/Spacers: U-shaped channels, 1-1/2 inches (38 mm) wide by 1 inch (25 mm) deep by 0.040 inch (1.0 mm) thick, made to fit between two adjacent trusses and accurately space them apart, and with tabs having metal teeth for fastening to trusses.

I. Drag Strut Connectors: Angle clip with one leg extended for fastening to the side of girder truss.
   1. Angle clip is 3 by 3 by 0.179 by 8 inches (76 by 76 by 4.55 by 203 mm) with extended leg 8 inches (203 mm) long. Connector has galvanized finish.
   2. Angle clip is 3 by 3 by 0.239 by 10-1/2 inches (76 by 76 by 6.07 by 267 mm) with extended leg 10-1/2 inches (267 mm) long. Connector has painted finish.

2.6 MISCELLANEOUS MATERIALS

A. Galvanizing Repair Paint: SSPC-Paint 20, with dry film containing a minimum of 92 percent zinc dust by weight.

2.7 FABRICATION

A. Cut truss members to accurate lengths, angles, and sizes to produce close-fitting joints.

B. Fabricate metal connector plates to sizes, configurations, thicknesses, and anchorage details required to withstand design loads for types of joint designs indicated.

C. Assemble truss members in design configuration indicated; use jigs or other means to ensure uniformity and accuracy of assembly, with joints closely fitted to comply with tolerances in TPI 1. Position members to produce design camber indicated.
   1. Fabricate wood trusses within manufacturing tolerances in TPI 1.

D. Connect truss members by metal connector plates located and securely embedded simultaneously in both sides of wood members by air or hydraulic press.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install wood trusses only after supporting construction is in place and is braced and secured.

B. If trusses are delivered to Project site in more than one piece, assemble trusses before installing.

C. Hoist trusses in place by lifting equipment suited to sizes and types of trusses required, exercising care not to damage truss members or joints by out-of-plane bending or other causes.

D. Install and brace trusses according to TPI recommendations and as indicated.

E. Install trusses plumb, square, and true to line and securely fasten to supporting construction.

F. Space trusses as indicated; adjust and align trusses in location before permanently fastening.

G. Anchor trusses securely at bearing points; use metal truss tie-downs or floor truss hangers as applicable. Install fasteners through each fastener hole in metal framing anchors according to manufacturer's fastening schedules and written instructions.

H. Securely connect each truss ply required for forming built-up girder trusses.
   1. Anchor trusses to girder trusses as indicated.

I. Install and fasten permanent bracing during truss erection and before construction loads are applied. Anchor ends of permanent bracing where terminating at walls or beams.
   1. Install bracing to comply with Section 061000 "Rough Carpentry."

J. Install wood trusses within installation tolerances in TPI 1.

K. Do not alter trusses in field. Do not cut, drill, notch, or remove truss members.

L. Replace wood trusses that are damaged or do not comply with requirements.
   1. Damaged trusses may be repaired according to truss repair details signed and sealed by the qualified professional engineer responsible for truss design, when approved by Architect.

3.2 REPAIRS AND PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

B. Protect wood trusses from weather. If, despite protection, wood trusses become wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

C. Repair damaged galvanized coatings on exposed surfaces according to ASTM A 780/A 780M and manufacturer's written instructions.

END OF SECTION 061753

SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
1. Exterior ~~and~~ **interior** storefront framing.
2. Exterior ~~and~~ **interior** manual-swing entrance doors.
3. ~~**Interior door frames, sidelights, and borrow lights.**~~
4. Brake metal in conjunction with frames.
5. Door hardware.
6. Sealant at interior and exterior perimeter of storefront.

B. Related Requirements:
1. Division 01 Section “Integrated Exterior Mockups” for on-site constructed mock-up requirements.
2. Division 07 Section 070800 "Building Envelope Commissioning" for Contractor's responsibilities in commissioning of building enclosure and coordination with Owner's commissioning agent.
3. Division 07 Section "Joint Sealants" for installation requirements of joint sealants installed with aluminum-framed systems and for sealants to the extent not specified in this Section.
4. Division 08 Section "Glazing" for glazing and spandrel panel requirements to the extent not specified in this Section.
5. Division 26 and 27 sections for conduits, access control and intrusion low voltage wiring, mag switches door operators, and miscellaneous equipment and accessories installed in conjunction with aluminum framed entrances and storefronts.

C. Products installed, but not furnished, under this Section include the following:
1. Balance of door hardware for aluminum doors furnished in Division 08 Section "Door Hardware."

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site. Comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to glazed aluminum storefront and entrance systems including, but not limited to, the following:
1. Meet with Owner; Architect; Owner's commissioning agent, storefront and entrance systems Installer; storefront and entrance systems manufacturer's representative; and installers whose work interfaces with or affects storefront and entrance systems.
2. Inspect and discuss condition of substrate and other preparatory work performed by other trades.
3. Review structural loading limitations.

4. Review coordination and tie in to air vapor barrier.
5. Review requirements for low voltage wiring concealed within storefront framing for access controls and intrusion detection systems.
6. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
7. Review required inspecting, testing, and certifying procedures.
8. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions.
9. Review temporary protection requirements for existing construction during and after installation.
10. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.
11. Provide minimum advance notice of 7 business days to participants prior to convening preinstallation conference.

B. Building Envelope Commissioning: Participate in building envelope commissioning pre-construction meeting and progress meetings as required by the Contractor and the Commissioning Agent.

1.4 ACTION SUBMITTALS

A. General: Submit in accordance with Division 01 Section "Submittal Procedures."
1. Submittals for Division 08 Sections "Hollow Metal Doors and Frames," "Wood Doors," "Aluminum-Framed Entrances and Storefronts," and "Door Hardware" shall be made concurrently.

B. Product Data: For each type of product.
1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes. Include manufacturer's installation instructions for system(s) specified.
2. For sealants and sealant primers used inside the weatherproofing system, include printed statement of VOC content.

C. Shop Drawings: For aluminum-framed entrances and storefronts prepared by or under the supervision of a qualified professional structural engineer. Include plans, elevations, sections, full-size details of components, masonry openings, flashing, and attachments to other work.
1. Include details of provisions for assembly expansion and contraction and for draining moisture occurring within the assembly to the exterior.
2. Include full-size isometric details of each vertical-to-horizontal intersection of aluminum-framed entrances and storefronts, showing the following:
    a. Joinery, including concealed welds.
    b. Anchorage.
    c. Expansion provisions.
    d. Glazing.
    e. Flashing and drainage.
    f. Wet glazing to retain laminated insulating glass and security glass.
3. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.
4. For entrance doors, include hardware schedule and indicate operating hardware types, functions, quantities, and locations.

a. Provide details for hardware reinforcement for closers, overhead stops, hinges and miscellaneous auxiliary hardware.
b. Obtain templates for hardware furnished in Section 087100 and prep doors and frames for proper installation and operation.

5. Indicate fastener layout and size for transferring loads back to supporting structure.

D. Samples for Initial Selection:
1. Initial Selection of Sealant Color: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
2. Aluminum: Factory applied color finishes as selected by Architect.

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

F. Delegated-Design Submittal: For aluminum-framed entrances and storefronts indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
1. Calculations shall be prepared by a professional structural engineer registered in the state where the project is located.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer signed by manufacturer certifying that Installers comply with requirements in "Quality Assurance" Article and professional engineer.

B. Product Test Reports: For aluminum-framed entrances and storefronts, for tests performed by a qualified independent testing agency. Tests shall be based on manufacturer's current system and shall indicate compliance with performance requirements.

D. Field quality-control reports.

E. Inspection report of egress doors.

F. Preinstallation conference meeting notes.

G. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For aluminum-framed entrances and storefronts to include in maintenance manuals.
1. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of entrance door hardware.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
   1. Engineering Responsibility: Preparation of data for glazed aluminum storefront systems including the following:
      a. Shop Drawings based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project and submission of reports of tests performed on manufacturer's standard assemblies.

B. Professional Engineer Qualifications: A professional structural engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of kind indicated. Engineering services are defined as those performed for installations of glazed storefront systems that are similar to those indicated for this Project in material, design, and extent.

C. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and in-service performance.
   1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

1.8 MOCKUPS

A. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
   1. Build mockup of typical curtain wall at location on the building as directed by the commissioning agent. ~~Comply with requirements of Section 014130 "Integrated Exterior Mockups" for on-site constructed mock-up requirements.~~
   2. Comply with requirements of Section 070800 "Building Envelope Commissioning."
   3. The Owner's commissioning agent will inspect the mockup.
   4. If Architect determines mockups do not comply with requirements, reconstruct mockups until mockups are approved.
   5. Testing shall be performed on mockups according to requirements in "Field Quality Control" Article.
   6. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

1.9 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of structural supports for aluminum-framed systems by field measurements before fabrication and indicate measurements on Shop Drawings.
   1. Coordinate rough opening, masonry opening, and wood blocking requirements.

1.10 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of aluminum-framed entrances and storefronts that do not comply with requirements or that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Structural failures including, but not limited to, excessive deflection.
      b. Failure of system to meet performance requirements.
      c. Noise or vibration created by wind and thermal and structural movements.
      d. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
      e. Adhesive or cohesive sealant failures.
      f. Water penetration through fixed glazing and framing areas.
      g. Failure of operating components.
      h. Glazing breakage.
   2. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Division 01 Section "Quality Requirements," to design aluminum-framed entrances and storefronts.
   1. Calculations shall be prepared by a professional structural engineer registered in the state where the project is located.

B. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed entrances and storefronts representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
   1. Aluminum-framed entrances and storefronts shall withstand movements of supporting structure including, but not limited to, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads..
   2. Failure also includes the following:
      a. Thermal stresses transferring to building structure.
      b. Deflection exceeding specified limits.
      c. Framing members transferring stresses, including those caused by thermal and structural movements to glazing.
      d. Glass breakage.
      e. Noise or vibration created by wind and thermal and structural movements.
      f. Loosening or weakening of fasteners, attachments, and other components.
      g. Failure of operating units.
      h. Sealant failure.

C. Structural Loads: Aluminum-framed entrances and storefronts shall be capable of withstanding the effects of the following loads as required by IBC 2015 and ASCE 7-10 as follows:
   1. Wind Loads:
      a. Basic Wind Speed: 120 MPH (3 Second Gust).
      b. Exposure Category: B.
   2. Wind Design Pressures:

a. Zone 4 - Field of Wall Pressures: Positive 23.4 psf and negative 25.6 psf.
b. Zone 5 - Building Corners (Within 11 Feet in Each Direction of Corner): Positive 23.4 psf and negative 29.4 psf.

D. Deflection of Framing Members: At design wind pressure, as follows:
1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans up to 13 feet 6 inches and to 1/240 of clear span plus 1/4 inch for spans greater than 13 feet 6 inches or an amount that restricts edge deflection of individual glazing lites to 3/4 inch, whichever is less.
2. Deflection Parallel to Glazing Plane: Limited to 1/360 of clear span or 1/8 inch, whichever is smaller.
a. Operable Units: Provide a minimum 1/16-inch clearance between framing members and operable units.
3. Cantilever Deflection: Where framing members overhang an anchor point, as follows:
a. Perpendicular to Plane of Wall: No greater than 1/240 of clear span plus 1/4 inch for spans greater than 11 feet 8-1/4 inches or 1/175 times span, for spans less than 11 feet 8-1/4 inches.

E. Structural: Test according to ASTM E 330 as follows:
1. When tested at positive and negative wind-load design pressures, assemblies do not evidence deflection exceeding specified limits.
2. When tested at 150 percent of positive and negative wind-load design pressures, assemblies, including anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.
3. Test Durations: As required by design wind velocity, but not less than 10 seconds.

F. Air Infiltration: Test according to ASTM E 283 for infiltration as follows:
1. Fixed Framing and Glass Area:
a. Maximum air leakage of 0.06 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft..
2. Entrance Doors:
a. Pair of Doors: Maximum air leakage of 1.0 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft.

G. Water Penetration under Static Pressure: Test according to ASTM E 331 as follows:
1. No evidence of water penetration through fixed glazing and framing areas when tested according to a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft..

H. Energy Performance: Certify and label energy performance according to NFRC as follows:
1. Thermal Transmittance (U-factor): Fixed glazing and framing areas shall have U-factor of not more than 0.69 Btu/sq. ft. x h x deg F as determined according to NFRC 100.
2. Solar Heat Gain Coefficient: Fixed glazing and framing areas shall have a solar heat gain coefficient of no greater than 0.20 as determined according to NFRC 200.
3. Condensation Resistance: Fixed glazing and framing areas shall have an NFRC-certified condensation resistance rating of no less than 62 as determined according to NFRC 500.

I. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes:
1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2. Thermal Cycling: No buckling; stress on glass; sealant failure; excess stress on framing, anchors, and fasteners; or reduction of performance when tested according to AAMA 501.5.
    a. High Exterior Ambient-Air Temperature: That which produces an exterior metal-surface temperature of 180 deg F.
    b. Low Exterior Ambient-Air Temperature: 0 deg F.
    c. Interior Ambient-Air Temperature: 75 deg F.

2.2 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the following:
1. Kawneer North America:
    a. Exterior Storefront and Entrances: Trifab 451T frames with 500 Heavy Wall Entrances with glazing stops from 500 IR Heavy Wall Entrances.
    ~~**b. Interior Storefront and Entrances (Vestibules): Trifab VG 451 frames with 500 Heavy Wall Entrances with glazing stops from 500 IR Heavy Wall Entrances.**~~
    ~~**c. Interior Storefront and Entrances: Trifab 451 frames with 500 Heavy Wall Entrances.**~~
2. Oldcastle Building Envelope:
    a. Exterior Storefront and Entrances: Series 3000 Thermal MultiPlane Storefront System with Rugged WS (Wide Stile) Entrances with glazing stops from WSD-500 StormMax Entrance Doors.
    ~~**b. Interior Storefront and Entrances (Vestibules): Series 3000 with Series 500 Rugged WS (Wide Stile) Entrances with glazing stops from WSD-500 StormMax Entrance Doors.**~~
    ~~**c. Interior Storefront and Entrances: Series 3000 with Series 500 Rugged WS (Wide Stile) Entrances.**~~
3. Tubelite:
    a. Exterior Storefront and Entrances: T14000 I/O Series Multiplane frames with Monumental Wide Stile Entrances with glazing stops from ForceFront Storm Monumental Wide Stile Doors.
    ~~**b. Interior Storefront and Entrances (Vestibules): E14000 frames with Monumental Wide Stile Entrances with glazing stops from ForceFront Storm Monumental Wide Stile Doors.**~~
    ~~**c. Interior Storefront and Entrances: E14000 frames with Monumental Wide Stile Entrances.**~~

B. Source Limitations: Obtain all components of aluminum-framed entrance and storefront system, including framing, entrance doors, and accessories, from single manufacturer.
1. Aluminum-framed entrances and storefront systems specified in this Section and curtain wall system specified in Division 08 Section "Glazed Aluminum Curtain Wall" shall be from same manufacturer.

2.3 FRAMING

A. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.
1. Construction: As follows:

a. Exterior Framing Members: Composite assemblies of two separate extruded-aluminum components permanently bonded by an elastomeric material of low thermal conductance.
   1) Where required by wind loads, provide heavy wall members or internal reinforcement.

~~**b. Interior Framing Members: Nonthermal.**~~

2. Glazing System: As follows:
   a. For Storefront and Entrances Indicated to Receive LAM, LAM-IG or SG Glazing: Retained mechanically with gaskets on unprotected side (exterior side) and wet glazed with structural silicone sealant on protected side (interior side).
      1) Structural silicone sealant required to retain the laminated glass, security glass and laminated IG units in place during forced entry attack.
   b. For Storefront Transoms Indicated to Receive IG Glass or Tempered Glass: Retained mechanically with gaskets on four sides.
3. Glazing Plane: ~~**Center**~~ Front.
4. Finish: High-performance organic finish for storefront and entrances used in exterior walls.
5. Fabrication Method: Screw spline system.
6. Provide components having face width indicated on Drawings.
7. Provide thermally broken extruded aluminum subframes for storefront sills.
8. Provide thermally broken extruded aluminum sill flashing with end dams for exterior storefronts.
9. Provide operable door units manufactured by storefront system manufacturer.

B. Backer Plates: Manufacturer's standard, continuous backer plates for framing members, if not integral, where framing abuts adjacent construction.

C. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
1. Provide extra-heavy reinforcement for hinges and closers for doors and frames.
2. Provide extra-heavy reinforcement for doors and frames receiving concealed overhead stops. Specified stop manufacturer’s installation indicates doors and frames be properly reinforced with 3/16-inch minimum thickness plate.

D. Materials:
1. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
   a. Sheet and Plate: ASTM B 209.
   b. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221.
   c. Extruded Structural Pipe and Tubes: ASTM B 429/B 429M.
   d. Structural Profiles: ASTM B 308/B 308M.
2. Steel Reinforcement: Manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM, and prepare surfaces according to applicable SSPC standard.
   a. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
   b. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.
   c. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.

2.4 ENTRANCE DOOR SYSTEMS

A. Entrance Doors: Manufacturer's standard glazed entrance doors for manual- and power-assisted-swing operation.
   1. Door Construction: 2-inch overall thickness, with minimum 0.188-inch- thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deeply penetrated and fillet welded or that incorporate concealed tie rods.
   2. Door Design: Wide stile; 5-inch nominal width with 10-inch high bottom rail, and 6-inch cross rail.
   3. Glazing Stops and Gaskets: As follows:
      a. Provide nonremovable glazing stops on outside of exterior doors ~~**and to nonsecured side of interior doors**~~.
      b. Glazing Stops for Exterior Doors ~~**and Interior Vestibule Doors**~~: Stops shall be stops from hurricane-resistant door assemblies; finished to match frame.
         1) Stops shall provide a minimum 1/2-inch bite on the security glass (SG) and insulated laminated glass (LAM-IG) to retain the glass during forced entry attack.
         2) Glazing to be wet glazed with structural silicone sealant on protected side (interior side) as specified in Division 08 Section "Glazing" to retain the glass during forced entry attack.
      ~~**c. Glazing Stops for Interior Doors, Sidelites and Borrowlites: Manufacturer's standard height stops.**~~
         ~~**1) Glazing to be wet glazed with structural silicone sealant on protected side (interior side) as specified in Division 08 Section "Glazing" to retain the glass during forced entry attack.**~~
   4. Reinforcing: Provide supplemental reinforcing plates for door hardware attachment, including hinges, closers and overhead stops.

2.5 DOOR HARDWARE

A. General: Provide heavy-duty units in sizes, numbers, and types recommended by entrance system and hardware manufacturers for entrances and uses indicated. Finish exposed parts to match door finish, unless otherwise indicated. Provide specified manufacturers without substitution.
   1. Opening-Force Requirements:
      a. Egress Doors: Not more than 15 lbf to release the latch and not more than 30 lbf to set the door in motion and not more than 15 lbf to open the door to its minimum required width.
      ~~**b. Accessible Interior Doors: Not more than 5 lbf to fully open door.**~~

B. Continuous, Gear-Type Hinges: Heavy-duty, extruded aluminum, pinless, concealed geared hinge leaves; joined by a continuous extruded aluminum channel cap; with concealed, self-lubricating with stainless-steel bearings between knuckles; fabricated one piece without splices full height of door and frame. Finish to match doors. Provide continuous hinges for ~~**interior and**~~ exterior aluminum doors.
   1. Manufacturer: Select Hinges. No substitution.
      a. Coordinate EPT product being supplied and template cutout requirements with Section 087100 hardware supplier

C. Weather Stripping: Manufacturer's standard replaceable components.

1. Compression Type: Made of ASTM D 2000, molded neoprene, or ASTM D 2287, molded PVC. Provide at head and jamb of all exterior doors for weather control.

D. Weather Sweeps: Manufacturer's standard exterior-door bottom sweep with concealed fasteners on mounting strip.

E. Silencers: BHMA A156.16, Grade 1.

F. Thresholds: BHMA A156.21, raised thresholds beveled with a slope of not more than 1:2, with maximum height of 1/2 inch, thermally broken. Coordinate cutouts for operating hardware with anchors and jamb clips. Provide 1/4 inch high
1. Material: Aluminum, mill finish.
2. Provide 1/4 inch high thresholds at door openings C101D, C101E, C101F.
3. Provide half saddle threshold to butt tight to entrance mat frames or tile at door openings A101, A101A, A101B, B132, A101C, B132, B132A, C108B, C108C, D139.

G. Balance of Hardware: Furnished in Division 08 Section "Door Hardware" for installation with the aluminum door and frame installation.

2.6 GLAZING

A. Glazing: Specified in Section 088000 "Glazing."

B. Weatherseal Sealants: ASTM C 920 for Type S; Grade NS; Class 25; Uses NT, G, A, and O; chemically curing silicone formulation that is compatible with structural sealant and other system components with which it comes in contact; recommended by structural-sealant, weatherseal-sealant, and structural-sealant-glazed storefront manufacturers for this use.
1. Color: As selected by Architect.

2.7 ACCESSORIES

A. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
2. Reinforce members to receive fastener threads.
3. Do not use exposed fasteners, except for hardware application. For hardware application, use exposed fasteners with countersunk Phillips screw heads, stainless steel, finished to match framing system or hardware being fastened, unless otherwise noted.

B. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.
1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123/A 123M or ASTM A 153/A 153M requirements.

C. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials.

D. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil thickness per coat.

E. Aluminum Brake Metal: Form exposed flashing from sheet aluminum ~~**finished to match framing**~~ and of sufficient thickness, not less than 0.063-inch thick, to maintain a flat appearance without visible deflection.

1. Finish: High-Performance Organic Finish: Two-coat fluoropolymer finish complying with AAMA 2604 and containing not less than 50 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

a. Color and Gloss: Kawneer Permadized Hardcoat Finish, color selection by Architect from manufacturers full range of standard colors.

F. Insulation Foam Sealant: On-site foam-in-place, single polyurethane component foam insulation sealant; Class 1 foam.

1. Products:
   a. GREAT STUFF PRO Gaps & Cracks Insulating Foam Sealant; Dow Chemical Company (The).
   b. Insulating Foam Sealant Gaps & Cracks; Owens Corning Foam Insulation, LLC.

2.8 FABRICATION

A. General: Fabricate glazed aluminum storefront and entrances systems assemblies according to approved Shop Drawings. Fabricate components that, when assembled, will have accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

B. Form or extrude aluminum shapes before finishing.

C. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

D. Fabricate components that, when assembled, have the following characteristics:

1. Profiles that are sharp, straight, and free of defects or deformations.
2. Accurately fitted joints with ends coped or mitered.
3. Physical and thermal isolation of glazing from framing members.
4. Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.
5. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
6. Provisions for field replacement of glazing from exterior.
7. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

E. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.

1. Glazing for exterior and vestibule storefront assemblies and entrances, except transoms, shall be wet seal glazed with silicone structural glazing sealant on the protected side (interior side) to retain glass during physical attack.

~~**2. Glazing for interior storefront sidelights and borrow lights receiving laminated glass (LAM) and receiving butt glazing shall be wet seal glazed with silicone structural glazing sealant on the protected side (interior side) to retain glass during physical attack.**~~

3. Glazing for storefront assemblies in exterior transoms and vestibule transoms and other storefront locations shall be standard glazing.

F. Structural-Sealant-Glazed Framing Members: Include accommodations for using temporary support device to retain glazing in place while structural sealant cures.

G. Storefront Framing: Fabricate components for assembly using screw-spline system.

H. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.
1. At exterior doors, provide compression weather stripping at fixed stops.
~~**2. At interior doors, provide silencers at stops to prevent metal-to-metal contact. Install three silencers on strike jamb of single-door frames and two silencers on head of frames for pairs of doors.**~~

I. Entrance Doors: Reinforce doors as required to support loads imposed by door operation and for installing entrance door hardware.
1. At pairs of exterior doors, provide sliding-type weather stripping retained in adjustable strip and mortised into door edge.
2. At exterior doors, provide weather sweeps applied to door bottoms.
3. Glazing stops for doors shall be stops from hurricane-resistant door assemblies.
4. Protected side (interior side) of glazing shall be wet seal glazed with silicone structural glazing sealant.

J. Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.
1. Install hardware for aluminum entrances furnished in Division 08 Section "Door Hardware."

K. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.9 ALUMINUM FINISHES

~~**A. Clear Anodic Finish, Interior Storefront: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.**~~

B. High-Performance Organic Finish, Exterior Storefront: Two-coat fluoropolymer finish complying with AAMA 2604 and containing not less than 50 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
1. Color and Gloss: Kawneer Permadized Hardcoat Finish, color selection by Architect from manufacturers full range of standard colors.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
   1. Confirm that wood blocking, where used, has been sufficiently fastened to transfer storefront wind loads back to structure.

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

3.2 PREPARATION

A. Prior to setting storefront, seal gaps between the ends of the brick returns and wood blocking and between back of lintel angles and wood blocking with foam sealant to seal joint, preventing cold air from entering that will short circuit the thermal break in aluminum storefront.

3.3 INSTALLATION

A. General:
   1. Comply with manufacturer's written instructions.
   2. Do not install damaged components.
   3. Fit joints to produce hairline joints free of burrs and distortion.
   4. Rigidly secure nonmovement joints.
   5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
   6. Seal perimeter and other joints watertight unless otherwise indicated.

B. Metal Protection:
   1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or by installing nonconductive spacers.
   2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.

D. Set continuous sill members and flashing in full sealant bed as specified in Division 07 Section "Joint Sealants" to produce weathertight installation. Install sills in one piece, full width of opening except where opening exceeds manufactured lengths. Provide sealed metal end dams at ends of sills. Sills shall turn up on backside to form pan, directing water to the exterior.

E. Install components plumb and true in alignment with established lines and grades.

F. Install operable units level and plumb, securely anchored, and without distortion. Adjust weather-stripping contact and hardware movement to produce proper operation.

G. Install glazing as specified in Division 08 Section "Glazing."

1. At storefront frames and doors, mask frame and glass to provide smooth, uniform tooling of structural sealant, with straight edges.

H. Install weatherseal sealant according to installation requirements in Division 07 Section "Joint Sealants" and according to sealant manufacturer's written instructions to produce weatherproof joints. Install joint filler behind sealant as recommended by sealant manufacturer. Color of sealant to match Architect selection. Provide sealants around storefront perimeter on interior sides between frame and air/vapor barrier and exterior sides between frame and exterior finishes.

I. Entrance Doors: Install doors and windows to produce smooth operation and tight fit at contact points.
   1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.
   2. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware according to hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.
   3. Install door hardware furnished in Division 08 Section "Door Hardware," including continuous hinges, power assist door operators, closers, pulls, exit devices, removable mullions, electric strikes, magnetic switches, overhead stops, trims and miscellaneous hardware as scheduled.
   4. Coordinate with access control and intrusion contractor and electrical contractor to provide access for conduits, concealed low voltage wiring within entrance and storefront frames for door operators, electrified mag switches and miscellaneous equipment and accessories installed in conjunction with aluminum framed entrances and storefronts.

3.4 ERECTION TOLERANCES

A. Erection Tolerances: Install aluminum-framed entrances and storefronts to comply with the following maximum tolerances:
   1. Plumb: 1/8 inch in 10 feet; 1/4 inch in 40 feet.
   2. Level: 1/8 inch in 20 feet; 1/4 inch in 40 feet.
   3. Alignment:
      a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch wide, limit offset from true alignment to 1/16 inch.
      b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch wide, limit offset from true alignment to 1/8 inch.
      c. Where surfaces are separated by reveal or protruding element of 1 inch wide or more, limit offset from true alignment to 1/4 inch.
   4. Location: Limit variation from plane to 1/8 inch in 12 feet; 1/2 inch over total length.

3.5 FIELD QUALITY CONTROL

A. Commissioning Agent: The Owner has hired a commissioning agent to perform tests and inspections, and to prepare test reports. Allow inspectors access to scaffolding and work areas, as needed to perform inspections and tests.
   1. Aluminum-framed entrances and storefronts will be considered defective if they do not pass tests and inspections.
   2. Commissioning agent shall prepare test and inspection reports.
   3. Repair or remove work where test results and inspections indicate that it does not comply with specified requirements.

4. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

B. Aluminum-framed entrances, storefronts and windows will be considered defective if they do not pass tests and inspections.

C. Commissioning agent shall prepare test and inspection reports.

D. Repair or remove work where test results and inspections indicate that it does not comply with specified requirements.

E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

F. Egress Door Inspections:
   1. Inspection Agency: Owner will engage a qualified inspector to perform inspections and to furnish reports to Architect.
   2. Inspect each door equipped with panic hardware, each door located in an exit enclosure, each electrically controlled egress door, and each door equipped with special locking arrangements in accordance with NFPA 101, Section 7.2.1.15.
      a. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.
      b. Reinspect repaired or replaced installations to determine if replaced or repaired door assembly installations comply with specified requirements.
      c. Inspection agency shall prepare inspection reports.

END OF SECTION 084113

This Page Left Intentionally Blank

SECTION 101400 - SIGNAGE

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
   1. Code-required interior panel signage, including but not limited to, accessibility room signage, toilet room signage and mechanical and electrical room signage.
   2. Exterior signage as indicated on the Drawings.

1.3 ALLOWANCES

A. Provide signage under the Interior and Exterior Building Signage Allowance as specified in Section 012100 "Allowances.

1.4 SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of sign.

B. Shop Drawings: Include plans, elevations, and large-scale sections of typical members and other components. Show mounting methods, grounds, mounting heights, layout, spacing, reinforcement, accessories, and installation details.
   1. Provide message list for each sign, including large-scale details of wording, lettering, artwork, and braille layout.

C. Samples for Verification: For each type of sign, include the following Samples to verify color selected:
   1. Panel Signs: Full-size Samples of each type of sign required.
   2. Approved samples will not be returned for installation into Project.

D. Maintenance Data: For signage cleaning and maintenance requirements to include in maintenance manuals.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION 101400

SECTION 260543 - UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Type EPEC raceways and fittings.
2. Type ERMC-SS raceways, elbows, couplings, and nipples.
3. Type ERMC-S raceways, elbows, couplings, and nipples.
4. Type IMC raceways.
5. Type PVC raceways and fittings.
6. Type RTRC-BG raceways and fittings.
7. Fittings for conduit, tubing, and cable.
8. Electrically conductive corrosion-resistant compounds for threaded conduit.
9. Solvent cements.
10. Duct accessories.
11. Handholes and boxes for exterior underground wiring.
12. Manholes for exterior underground wiring.
13. Utility structure accessories.
14. Duct sealing.

B. Related Requirements:
1. Section 260010 "Supplemental Requirements for Electrical" for additional abbreviations, definitions, submittals, qualifications, testing agencies, and other Project requirements applicable to Work specified in this Section.
2. Section 013100 "Project Management and Coordination" for preinstallation conference procedures.
3. Section 260519 "Low-Voltage for Electrical Power Conductors and Cables" for nonmetallic underground conduit with conductors (Type NUCC).

1.2 DEFINITIONS

A. Duct: A single raceway or multiple raceways, installed singly or as components of a duct bank.

B. Duct Bank: Two or more ducts installed in parallel, direct buried or with additional casing materials such as concrete.

C. Handhole: An underground chamber containing electrical cables, sized such that personnel are not required to enter in order to access the cables.

D. Manhole: An underground chamber containing electrical cables and equipment, sized to provide access with working space clearances.

E. Trafficways: Locations where vehicular or pedestrian traffic is a normal course of events.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Coordination Meeting(s): For underground ducts and raceways. Conduct meeting(s) at Project site. It is recommended to hold this meeting with representatives from the Utility to coordinate removal of existing underground feeders and relocation.
   1. Attendees: Installers, fabricators, representatives of manufacturers, and administrants for field tests and inspections. Notify Architect and Construction Manager of scheduled meeting dates.

1.4 ACTION SUBMITTALS

A. Product Data:
   1. Type EPEC raceways and fittings.
   2. Type ERMC-SS raceways, elbows, couplings, and nipples.
   3. Type ERMC-S raceways, elbows, couplings, and nipples.
   4. Type IMC raceways.
   5. Type PVC raceways and fittings.
   6. Type RTRC-BG raceways and fittings.
   7. Fittings for conduit, tubing, and cable.
   8. Electrically conductive corrosion-resistant compounds for threaded conduit.
   9. Solvent cements.
   10. Duct accessories.
   11. Handholes and boxes for exterior underground wiring.
   12. Manholes for exterior underground wiring.
   13. Utility structure accessories.
   14. Duct sealing.

B. Shop Drawings:
   1. Electric Utility Duct Banks and Structures:
      a. Include plans, elevations, sections, and details, including attachments to other Work.
      b. Indicate locations of private property boundaries and utility easements.
      c. Include information required for approval by electric utility and for obtaining public space utility work permits.
   2. Precast or Factory-Fabricated Concrete Structures:
      a. Include plans, elevations, sections, and details, including attachments to other Work.
      b. Include duct entry provisions, including locations and duct sizes, and methods and materials for waterproofing duct entry locations.
      c. Include reinforcement details.
      d. Include frame and cover design and manhole chimneys.
      e. Include ladder and/or step details.
      f. Include grounding details.
      g. Include dimensioned locations of cable rack inserts, pulling-in and lifting irons, sumps, and other accessories.
      h. Include joint details.
   3. Factory-Fabricated Handholes and Boxes Other Than Precast Concrete:
      a. Include dimensioned plans, sections, and elevations, and fabrication and installation details.

b. Include duct entry provisions, including locations and duct sizes, and methods and materials for waterproofing duct entry locations.
c. Include cover design.
d. Include grounding details.
e. Include dimensioned locations of cable rack inserts, pulling-in and lifting irons, and other accessories.

C. Field quality-control reports.

1.5 INFORMATIONAL SUBMITTALS

A. Certificates: For concrete and steel used in precast concrete manholes and handholes, as required by ASTM C858.

B. Manufacturers' published instructions.

C. Field Reports:
1. Factory Test Reports: For handholes and boxes.
2. Manufacturer's field reports for field quality-control support.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Spare Parts: Furnish to Owner spare parts necessary for repairing or adding more cables to manholes or handholes that are packaged with protective covering for storage and identified with labels describing contents.
1. Cable-Support Stanchions, Arms, and Associated Fasteners: Five percent of quantity of each item installed.
2. Insulators: Five percent of quantity of each item installed.

PART 2 - PRODUCTS

2.1 TYPE EPEC RACEWAYS AND FITTINGS

A. Performance Criteria:
1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
2. General Characteristics: UL 651A and UL CCN EAZX.
3. For detailed requirements for specifying the following raceway types and associated fittings, see Specification 260533 – Raceway and Boxes for Electrical Systems:
a. Schedule 40 Electrical HDPE Underground Conduit (EPEC-40)
b. Schedule 80 Electrical HDPE Underground Conduit (EPEC-80)
c. Type A Electrical HDPE Underground Conduit (EPEC-A)
d. Type B Electrical HDPE Underground Conduit (EPEC-B)

2.2 TYPE ERMC-S and ERMC-SS RACEWAYS, ELBOWS, COUPLINGS, AND NIPPLES

A. Performance Criteria:
   1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
   2. General Characteristics: UL 6 and UL CCN DYIX.
   3. For detailed requirements for specifying the following raceway types and associated fittings, see Specification 260533 – Raceway and Boxes for Electrical Systems:
      a. Galvanized-Steel Electrical Rigid Metal Conduit (ERMC-S-G), Elbows, Couplings, and Nipples
      b. PVC-Coated-Steel Electrical Rigid Metal Conduit (ERMC-S-PVC), Elbows, Couplings, and Nipples
      c. Type IMC Raceways
      d. Stainless Steel Electrical Rigid Metal Conduit (ERMC-SS), Elbows, Couplings, and Nipples

2.3 TYPE PVC RACEWAYS AND FITTINGS

A. Performance Criteria:
   1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
   2. General Characteristics: UL 651 and UL CCN DZYR.
   3. For detailed requirements for specifying the following raceway types and associated fittings, see Specification 260533 – Raceway and Boxes for Electrical Systems:
      a. Schedule 40 Rigid PVC Conduit (PVC-40) and Fittings
      b. Schedule 80 Rigid PVC Conduit (PVC-80) and Fittings
      c. Type A Rigid PVC Concrete-Encased Conduit (PVC-A) and Fittings
      d. Type EB Rigid PVC Concrete-Encased Underground Conduit (PVC-EB) and Fittings
      e. Type RTRC-BG Raceways and Fittings

2.4 DUCT ACCESSORIES

A. Duct Spacers: Factory-fabricated, rigid, PVC interlocking spacers; sized for type and size of duct with which used, and selected to provide minimum duct spacing indicated while supporting duct during concreting or backfilling.
   1. Legrand, Graybar, Eaton, or approved equal.

B. Underground-Line Warning Tape: In accordance with Section 260553 "Identification for Electrical Systems."

C. Concrete Warning Planks: Nominal 12 by 24 by 3 inch (300 by 600 by 75 mm) in size, manufactured from 6000 psi (41 MPa) concrete.
   1. Color: Red dye added to concrete during batching.
   2. Mark each plank with "ELECTRIC" in 2 inch (50 mm) high, 3/8 inch (10 mm) deep letters.

2.5 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND WIRING

A. Performance Criteria:
   1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
   2. General Characteristics:
      a. ASTM C858 for design and manufacturing processes.
      b. SCTE 77.

B. **Heavy Duty** Precast Concrete Handholes and **Junction** Boxes:
   1. **Manufacturers: Locke Solutions, or approved equal.**
   2. Description: Factory-fabricated, reinforced-concrete, monolithically poured walls and bottom unless open-bottom enclosures are indicated. Frame and cover must form top of enclosure and must have load rating consistent with that of handhole or box.
   3. Hubbell, Grainger or approved equivalent
   4. Configuration: Units must be designed for flush burial and have open bottom unless otherwise indicated.
   5. Frame and Cover:
      a. Weatherproof cast-iron frame, with cast-iron cover with recessed cover hook eyes and tamper-resistant, captive, cover-securing bolts.
      b. Cover Finish: Nonskid finish must have minimum coefficient of friction of 0.50.
      c. Cover Legend: Molded lettering, "ELECTRIC".
   6. Extensions and Slabs: Designed to mate with bottom of enclosure. Same material as enclosure.
      a. Extension must provide increased depth of 12 inch (300 mm).
      b. Slab: Same dimensions as bottom of enclosure, and arranged to provide closure.
   7. Joint Sealant: Asphaltic-butyl material with adhesion, cohesion, flexibility, and durability properties necessary to withstand maximum hydrostatic pressures at installation location with ground-water level at grade.
   8. Knockout Panels: Precast openings in walls, arranged to match dimensions and elevations of approaching duct, plus additional 12 inch (300 mm) vertically and horizontally to accommodate alignment variations.
      a. Knockout panels must be located no less than 6 inch (150 mm) from interior surfaces of walls, floors, or frames and covers of handholes, but close enough to corners to facilitate racking of cables on walls.
      b. Knockout panel opening must have cast-in-place, welded-wire fabric reinforcement for field cutting and bending to tie in to concrete envelopes of duct.
      c. Knockout panels must be framed with at least two additional No. 3 steel reinforcing bars in concrete around each opening.
      d. Knockout panels must be 1-1/2 to 2 inch (38 to 50 mm) thick.

C. Polymer Concrete Handholes and Boxes with Polymer Concrete Cover:
   1. Description: Molded of sand, concrete, and aggregate, bound together with polymer resin, and reinforced with steel or fiberglass or combination.
   2. Hubbell-Quazite, Grainger, or approved equivalent
   3. Configuration: Units must be designed for flush burial and have open bottom unless otherwise indicated.
   4. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and installed location.
      a. Cover Finish: Nonskid finish must have minimum coefficient of friction of 0.50.
      b. Cover Legend: Molded lettering, "ELECTRIC".
   5. Conduit Entrance Provisions: Conduit-terminating fittings must mate with entering ducts for secure, fixed installation in enclosure wall.

6. Duct Entrance Provisions: Duct-terminating fittings must mate with entering duct for secure, fixed installation in enclosure wall.
7. Handholes 12 inch wide by 24 inch long (300 mm wide by 600 mm long) and larger must have factory-installed inserts for cable racks and pulling-in irons.
8. Options:
    a. Color: Gray.

2.6 MANHOLES FOR EXTERIOR UNDERGROUND WIRING

A. Performance Criteria:
1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
2. General Characteristics:
    a. ASTM C858 for design and manufacturing processes.
    b. SCTE 77.

B. Precast Concrete Manholes:
1. Description: One-piece units and units with interlocking mating sections, complete with accessories, hardware, and features.
2. Old Castle, Hubbell, Shea, or approved equal
3. Knockout Panels: Precast openings in walls, arranged to match dimensions and elevations of approaching duct, plus additional 12 inch (300 mm) vertically and horizontally to accommodate alignment variations.
    a. Splayed location.
    b. Knockout panels must be located no less than 6 inch (150 mm) from interior surfaces of walls, floors, or roofs of manholes, but close enough to corners to facilitate racking of cables on walls.
    c. Knockout panel opening must have cast-in-place, welded-wire fabric reinforcement for field cutting and bending to tie in to concrete envelopes of duct.
    d. Knockout panel must be framed with at least two additional No. 3 steel reinforcing bars in concrete around each opening.
    e. Knockout panels must be 1-1/2 to 2 inch (38 to 50 mm) thick.
4. Ground Rod Sleeve: Provide 3 inch (75 mm) PVC sleeve in manhole floors 2 inch (50 mm) from wall adjacent to, but not underneath, duct entering structure.
5. Joint Sealant: Asphaltic-butyl material with adhesion, cohesion, flexibility, and durability properties necessary to withstand maximum hydrostatic pressures at installation location with ground-water level at grade.
6. Source Quality Control: Test and inspect in accordance with ASTM C1037.

2.7 UTILITY STRUCTURE ACCESSORIES

A. Description: Utility equipment and accessory items used for utility structure access and utility support, listed and labeled for intended use and application, and complying with the following local utility company requirements:
1. See CMP standard requirements for underground vaults.

B. Manufacturer must be approved by utility company.

C. Manhole Frames, Covers, and Chimney Components: Comply with structural design loading specified for manhole.
   1. Frame and Cover: Weatherproof, gray cast iron complying with ASTM A48/A48M, Class 30B with milled cover-to-frame bearing surfaces; diameter, 26 inch (660 mm).
      a. Cover Finish: Nonskid finish must have minimum coefficient of friction of 0.50.
      b. Special Covers: Recess in face of cover designed to accept finish material in paved areas.
   2. Cover Legend: Cast in; selected to suit system.
      a. Legend:

         1) "ELECTRIC-LV" for duct systems with power wires and cables for systems operating at 600 V and less.
         2) "ELECTRIC-HV" for duct systems with medium-voltage cables.
   3. Manhole Chimney Components: Precast concrete rings with dimensions matched to those of roof opening.
      a. Mortar for Chimney Ring and Frame and Cover Joints: Comply with ASTM C270, Type M, except for quantities less than 2.0 cu. ft (60 L) where packaged mix complying with ASTM C387/C387M, Type M, may be used.

D. Manhole Sump Frame and Grate: ASTM A48/A48M, Class 30B, gray cast iron.

E. Pulling Eyes in Concrete Walls: Eyebolt with reinforcing-bar fastening insert, 2 inch (50 mm) diameter eye, and 1-by-4 inch (25-by-100 mm) bolt.
   1. Working Load Embedded in 6 inch (150 mm), 4000 psi (27.6 MPa) Concrete: 13,000 lbf (58 kN) minimum tension.

F. Pulling-in and Lifting Irons in Concrete Floors: 7/8 inch (22 mm) diameter, hot-dip galvanized, bent steel rod; stress relieved after forming; fastened to reinforcing rod; and with exposed triangular opening.
   1. Ultimate Yield Strength: 40,000 lbf (180 kN) shear and 60,000 lbf (270 kN) tension.

G. Bolting Inserts for Concrete Utility Structure Cable Racks and Other Attachments: Flared, threaded inserts of noncorrosive, chemical-resistant, nonconductive thermoplastic material; 1/2 inch (13 mm) ID by 2-3/4 inch (69 mm) deep, flared to 1-1/4 inch (31 mm) minimum at base.
   1. Tested Ultimate Pullout Strength: 12,000 lbf (53 kN) minimum.

H. Ground Rod Sleeve: 3 inch (75 mm) PVC sleeve in manhole floors 2 inch (50 mm) from wall adjacent to, but not underneath, ducts routed from facility.

I. Expansion Anchors for Installation after Concrete Is Cast: Zinc-plated, carbon-steel-wedge type with stainless steel expander clip with 1/2 inch (13 mm) bolt, 5300 lbf (24 kN) rated pullout strength, and minimum 6800 lbf (30 kN) rated shear strength.
   1. Stanchions: T-section or channel with provisions to connect to other sections or channels to form continuous unit; 1-1/2 inch (38 mm) in width by nominal 24 inch (600 mm) long; punched with 14 hook holes on 1-1/2 inch (38 mm) centers for cable-arm attachment.
   2. Arms: 1-1/2 inch (38 mm) wide, lengths ranging from 3 inch (75 mm) with 450 lb (204 kg) minimum capacity to 18 inch (450 mm) with 250 lb (114 kg) minimum capacity. Arms must have slots along full length for cable ties and be arranged for secure mounting in horizontal position at vertical locations on stanchions.
   3. Insulators: High-glaze, wet-process porcelain arranged for mounting on cable arms.

J. Nonmetallic Cable Rack Assembly: Components fabricated from nonconductive, fiberglass-reinforced polymer.
   1. Stanchions: Nominal 36 inch (900 mm) high by 4 inch (100 mm) wide, with provisions to connect to other sections to form continuous unit, with minimum of nine holes for arm attachment.
   2. Arms: Arranged for secure, drop-in attachment in horizontal position at locations on cable stanchions, and capable of being locked in position. Arms must be available in lengths ranging from 3 inch (75 mm) with 450 lb (204 kg) minimum capacity to 20 inch (500 mm) with 250 lb (114 kg) minimum capacity. Top of arm must be nominally 4 inch (100 mm) wide, and arm must have slots along full length for cable ties.

K. Fixed Manhole Ladders: Arranged for attachment to roof or wall of manhole. Ladder and mounting brackets and braces must be fabricated from nonconductive, structural-grade, fiberglass-reinforced resin.

L. Cover Hooks: Heavy duty, designed for lifts 60 lbf (270 N) and greater. Two ladders(s) are required.

2.8 DUCT SEALING

A. Duct-Sealing Compound: Nonhardening, safe for contact with human skin, not deleterious to cable insulation, and workable at temperatures as low as 35 deg F (2 deg C). Compound must be capable of withstanding temperature of 300 deg F (150 deg C) without slump and adhering to clean surfaces of plastic ducts, metallic conduit, conduit and duct coatings, concrete, masonry, lead, cable sheaths, cable jackets, insulation materials, and common metals. Duct sealing compound must be removable without damaging ducts or cables.

B. Inflatable Duct-Sealing System: Wraparound inflatable bladder that seals ducts that are empty or containing conductors against air and water infiltration. System is suitable for use in steel, plastic, or concrete ducts and penetrations.

2.9 SOURCE QUALITY CONTROL

A. Product Data: Prepare and submit catalog cuts, brochures, diagrams, schedules, and performance data illustrating size, physical appearance, and other characteristics of product.
   1. Duct-bank materials, including spacers and miscellaneous components.
   2. Ducts, conduits, and their accessories, including elbows, end bells, bends, fittings, and solvent cement.
   3. Accessories for manholes, handholes, boxes, and other utility structures.
   4. Underground-line warning tape.

B. Manufacturer's Published Instructions: Prepare and submit installation, testing, and operating instructions for product.

C. Factory Tests for Handholes and Boxes:
   1. Factory Tests and Inspections: Perform the following tests and inspections on handholes and boxes, by, or under supervision of, qualified electrical testing laboratory recognized by authorities having jurisdiction, before delivering to site. Affix label with name and date of manufacturer's certification of system compliance.

a. Precast Concrete Utility Structures: Test and inspect in accordance with ASTM C1037.
b. Polymer Concrete and Nonconcrete Handhole and Pull-Box Prototypes: Test prototypes of handholes and boxes for compliance with SCTE 77. Strength tests must be for specified tier ratings of products supplied. Testing machine pressure gages must have current calibration certification, complying with ISO 9000 and ISO 10012, and traceable to NIST standards.

2. Nonconforming Work:
   a. Equipment that does not pass tests and inspections will be considered defective.
3. Factory Test Reports: Prepare and submit factory test and inspection reports.

PART 3 - EXECUTION

3.1 PREPARATION

A. Coordinate layout and installation of duct, duct bank, manholes, handholes, and boxes with final arrangement of other utilities, site grading, and surface features as determined in field. Notify Architect if there is conflict between areas of excavation and existing structures or archaeological sites to remain.

B. Coordinate elevations of duct and duct-bank entrances into manholes, handholes, and boxes with final locations and profiles of duct and duct banks, as determined by coordination with other utilities, underground obstructions, and surface features. Revise locations and elevations as required to suit field conditions and to ensure that duct and duct bank will drain to manholes and handholes, and as approved by Architect.

C. Clear and grub vegetation to be removed, and protect vegetation to remain in accordance with Section 311000 "Site Clearing." Remove and stockpile topsoil for reapplication in accordance with Section 311000 "Site Clearing."

3.2 SELECTION OF UNDERGROUND DUCTS

A. Duct for Electrical Cables More Than 600 V: PVC-80, concrete encased unless otherwise indicated.

B. Duct for Electrical Feeders 600 V and Less: PVC-80, direct buried unless otherwise indicated.

C. Duct for Electrical Branch Circuits: PVC-80, direct buried unless otherwise indicated.

D. Underground Ducts Crossing Walks and Driveways: PVC-80 direct buried.

E. Underground Ducts Crossing Roadways: PVC-80, encased in reinforced concrete.

F. Stub-ups: Concrete encased, PVC-80.

3.3 SELECTION OF UNDERGROUND ENCLOSURES

A. Handholes and Boxes:
   1. Units in Roadways and Other Deliberate Traffic Paths: Precast concrete, AASHTO HB 17, H-20 structural load rating.
   2. Units in Driveway, Parking Lot, and Off-Roadway Locations, Subject to Occasional, Nondeliberate Loading by Heavy Vehicles: Precast concrete, AASHTO HB 17, H-10, Precast concrete, AASHTO HB 17, H-20 structural load rating.
   3. Units in Sidewalk and Similar Applications with Safety Factor for Nondeliberate Loading by Vehicles: Precast concrete, AASHTO HB 17, H-10 or Polymer concrete units, SCTE 77, Tier 8 structural load rating.
   4. Units Subject to Light-Duty Pedestrian Traffic Only: Fiberglass-reinforced polyester resin, structurally tested in accordance with SCTE 77 with 3000 lbf (13 345 N) vertical loading.
   5. Cover design load must not exceed load rating of handhole or box.

B. Manholes: Precast or cast-in-place concrete.
   1. Units Located in Roadways and Other Deliberate Traffic Paths by Heavy or Medium Vehicles: H-20 structural load rating in accordance with AASHTO HB 17.
   2. Units Not Located in Deliberate Traffic Paths by Heavy or Medium Vehicles: H-10 load rating in accordance with AASHTO HB 17.

3.4 EARTHWORK

A. Excavation and Backfill: Comply with Section 312000 "Earth Moving," but do not use heavy-duty, hydraulic-operated, compaction equipment.

B. Restoration: Restore area after construction vehicle traffic in immediate area is complete.

C. Restore surface features at areas disturbed by excavation, and re-establish original grades unless otherwise indicated. Replace removed sod immediately after backfilling is completed.

D. Restore areas disturbed by trenching, storing of dirt, cable laying, and other work. Restore vegetation and include necessary topsoiling, fertilizing, liming, seeding, sodding, sprigging, and mulching. Comply with Section 329200 "Turf and Grasses" and Section 329300 "Plants."

E. Cut and patch existing pavement in path of underground duct, duct bank, and underground structures in accordance with "Cutting and Patching" Article in Section 017300 "Execution."

3.5 INSTALLATION OF DUCTS AND DUCT BANKS

A. Reference Standards:
   1. Unless more stringent requirements are specified in Contract Documents or manufacturers' published instructions, comply with NEMA TCB 2 for installation of underground ducts and duct banks.
   2. Consult Architect for resolution of conflicting requirements.

B. Special Techniques:
   1. Where indicated on Drawings, install duct, spacers, and accessories into duct-bank configuration shown. Duct installation requirements in this Section also apply to duct bank.

2. Steel raceway, bends, and fittings in single duct run or duct bank must be of same type.
3. Slope: Pitch duct minimum slope of 1:300 down toward manholes and handholes and away from buildings and equipment. Slope duct from high point between two manholes to drain in both directions.
4. Install expansion fitting near center of straight line duct with calculated expansion of more than 3/4 inch (19 mm).
5. Curves and Bends:
    a. Use 5-degree angle couplings for small changes in direction. Use manufactured long sweep bends with minimum radius of 48 inch (1200 mm), both horizontally and vertically, at other locations unless otherwise indicated.
    b. Field bending must be in accordance with NFPA 70 minimum radii requirements, except bends over 45 degrees must be made with minimum radius of 48 inch (1200 mm). Use only equipment specifically designed for material and size involved. Use PVC heating bender for bending PVC conduit.
    c. Duct must have maximum of 180 degrees of bends between pull points.
6. Joints: Use solvent-cemented joints in nonmetallic duct and fittings and make watertight in accordance with manufacturer's published instructions. Stagger couplings so those of adjacent duct do not lie in same plane. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with minimum 3 inch (75 mm) of concrete for minimum of 12 inch (300 mm) on each side of coupling.
    a. Install insulated grounding bushings on steel raceway terminations that are less than 12 inch (300 mm) below grade or floor level and do not terminate in hubs.
7. Installation Adjacent to High-Temperature Steam Lines: Where duct is installed parallel to underground steam lines, perform calculations showing duct will not be subject to environmental temperatures above 104 deg F (40 deg C). Where environmental temperatures are calculated to rise above 104 deg F (40 deg C), and anywhere duct crosses above underground steam line, install insulation blankets listed for direct burial to isolate duct bank from steam line to maintain maximum environmental temperature of 104 deg F (40 deg C).
8. Duct Terminators for Entrances to Cast-in-Place Manholes and Concrete Handholes: Use manufactured, cast-in-place duct terminators, with entrances into structure spaced approximately 6 inch (150 mm) o.c. for 4 inch (100 mm) duct, and vary proportionately for other duct sizes.
    a. Begin change from regular spacing to terminator spacing 10 ft (3 m) from terminator, without reducing duct line slope and without forming trap in line.
9. Building Wall Penetrations: Make transition from underground duct to steel raceway at least 10 ft (3 m) outside building wall, without reducing duct line slope away from building and without forming trap in line. Use fittings manufactured for transition to steel raceway type installed. Install steel raceway penetrations of building walls as specified in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."
10. Install manufactured steel raceway elbows for stub-ups at poles unless otherwise indicated. Encase elbows for stub-up ducts throughout length of elbow.
    a. Couple steel elbows to ducts with adapters designed for this purpose, and encase coupling with minimum 3 inch (75 mm) of concrete for minimum of 12 inch (300 mm) on each side of coupling.
11. Sealing: Provide temporary closure at terminations of duct with pulled cables. Seal spare duct at terminations. Use sealing compound and plugs to withstand at least 15 psig (1.03 MPa) hydrostatic pressure.
12. Pulling Cord: Install 200 lbf (1000 N) test nylon cord in empty ducts.
13. Concrete-Encased Ducts and Duct Bank:

a. Excavate trench bottom to provide firm and uniform support for duct. Prepare trench bottoms as specified in Section 312000 "Earth Moving" for pipes 6 inch (150 mm) or less in nominal diameter.
b. Width: Excavate trench minimum 3 inch (75 mm) wider than duct on each side.
c. Depth: Install so top of duct envelope is at least 24 inch (600 mm) below finished grade in areas not subject to deliberate traffic, and at least 30 inch (750 mm) below finished grade in deliberate traffic paths for vehicles unless otherwise indicated. Install so top of duct envelope is below local frost line.
d. Support duct on duct spacers coordinated with duct size, duct spacing, and outdoor temperature.
e. Spacer Installation: Place spacers close enough to prevent sagging and deforming of duct, with not less than four spacers per 20 ft (6 m) of duct. Place spacers within 24 inch (600 mm) of duct ends. Stagger spacers approximately 6 inch (150 mm) between tiers. Secure spacers to earth and to duct to prevent floating during concreting. Tie entire assembly together using fabric straps; do not use tie wires or reinforcing steel that may form conductive or magnetic loops around ducts or duct groups.
f. Minimum Space between Ducts: 3 inch (75 mm) between edge of duct and exterior envelope wall, 2 inch (50 mm) between ducts for like services, and 4 inch (100 mm) between power and communications ducts.
g. Elbows:

    1) Use manufactured duct elbows for stub-ups and at changes of direction in duct unless otherwise indicated. Extend encasement throughout length of elbow.
    2) Use manufactured steel elbows for stub-ups, at building entrances, and at changes of direction in duct run.

h. Stub-ups to Outdoor Equipment: Extend concrete-encased steel raceway horizontally minimum of 60 inch (1500 mm) from edge of equipment base.

    1) Stub-ups must be minimum 4 inch (100 mm) above finished floor and minimum 3 inch (75 mm) from conduit side to edge of slab.

i. Stub-ups to Indoor Equipment: Extend concrete-encased steel raceway horizontally minimum of 60 inch (1500 mm) from edge of wall. Install insulated grounding bushings on terminations at equipment.

    1) Stub-ups must be minimum 4 inch (100 mm) above finished floor and no less than 3 inch (75 mm) from conduit side to edge of slab.

j. Reinforcement: Reinforce concrete-encased duct where crossing disturbed earth and where indicated. Arrange reinforcing rods and ties without forming conductive or magnetic loops around ducts or duct groups.
k. Forms: Use walls of trench to form side walls of duct bank where soil is self-supporting and concrete envelope can be poured without soil inclusions; otherwise, use forms.
l. Concrete Cover: Install minimum of 3 inch (75 mm) of concrete cover between edge of duct to exterior envelope wall, 2 inch (50 mm) between duct of like services, and 4 inch (100 mm) between power and communications ducts.
m. Place minimum 6 inch (150 mm) of engineered fill above concrete encasement of duct.
n. Concreting Sequence: Pour each run of envelope between manholes or other terminations in one continuous operation.

1) Start at one end and finish at other, allowing for expansion and contraction of duct as its temperature changes during and after pour. Use expansion fittings installed in accordance with manufacturer's published instructions, or use other specific measures to prevent expansion-contraction damage.
2) If more than one pour is necessary, terminate each pour in vertical plane and install 3/4 inch (15 mm) reinforcing-rod dowels extending minimum of 18 inch (450 mm) into concrete on both sides of joint near corners of envelope.

o. Pouring Concrete: Comply with requirements in "Concrete Placement" Article in Section 033000 "Cast-in-Place Concrete." Place concrete carefully during pours to prevent voids under and between duct and at exterior surface of envelope. Do not allow heavy mass of concrete to fall directly onto ducts. Allow concrete to flow around duct and rise up in middle, uniformly filling open spaces. Do not use power-driven agitating equipment unless specifically designed for duct-installation application.

14. Direct-Buried Duct and Duct Bank:
    a. Excavate trench bottom to provide firm and uniform support for duct. Comply with requirements in Section 312000 "Earth Moving" for preparation of trench bottoms for pipes less than 6 inch (150 mm) in nominal diameter.
    b. Width: Excavate trench 12 inch (300 mm) wider than duct on each side.
    c. Depth: Install top of duct at least 36 inch (900 mm) below finished grade unless otherwise indicated.
    d. Set elevation of top of duct bank below frost line.
    e. Place minimum 3 inch (75 mm) of sand as bed for duct. Place sand to minimum of 6 inch (150 mm) above top level of duct.
    f. Support ducts on duct spacers coordinated with duct size, duct spacing, and outdoor temperature.
    g. Spacer Installation: Place spacers close enough to prevent sagging and deforming of duct, with not less than four spacers per 20 ft (6 m) of duct. Place spacers within 24 inch (600 mm) of duct ends. Stagger spacers approximately 6 inch (150 mm) between tiers. Secure spacers to earth and to ducts to prevent floating during concreting. Tie entire assembly together using fabric straps; do not use tie wires or reinforcing steel that may form conductive or magnetic loops around ducts or duct groups.
    h. Install duct with minimum of 3 inch (75 mm) between ducts for like services and 6 inch (150 mm) between power and communications duct.
    i. Install manufactured duct elbows for stub-ups, at building entrances, and at changes of direction in duct direction unless otherwise indicated. Encase elbows for stub-up ducts throughout length of elbow.
    j. After installing first tier of duct, backfill and compact. Start at tie-in point and work toward end of duct run, leaving ducts at end of run free to move with expansion and contraction as temperature changes during this process. Repeat procedure after placing each tier. After placing last tier, hand place backfill to 4 inch (100 mm) over duct and hand tamp. Firmly tamp backfill around ducts to provide maximum supporting strength. Use hand tamper only. After placing controlled backfill over final tier, make final duct connections at end of run and complete backfilling with normal compaction. Comply with requirements in Section 312000 "Earth Moving" for installation of backfill materials.
15. Warning Planks: Bury warning planks approximately 12 inch (300 mm) above direct-buried duct, placing them 36 inch (900 mm) o.c. Align planks along width and along centerline of duct or duct bank. Provide additional plank for each 12 inch (300 mm)

increment of duct-bank width over nominal 18 inch (450 mm). Space additional planks 12 inch (300 mm) apart, horizontally across width of ducts.

16. Underground-Line Warning Tape: Bury nonconducting underground line specified in Section 260553 "Identification for Electrical Systems" no less than 12 inch (300 mm) above concrete-encased duct and duct banks and approximately 12 inch (300 mm) below grade. Align tape parallel to and within 3 inch (75 mm) of centerline of duct bank. Provide additional warning tape for each 12 inch (300 mm) increment of duct-bank width over nominal 18 inch (450 mm). Space additional tapes 12 inch (300 mm) apart, horizontally across width of ducts.
17. Ground ducts and duct banks in accordance with Section 260526 "Grounding and Bonding for Electrical Systems."

3.6 INSTALLATION OF CONCRETE MANHOLES, HANDHOLES, AND BOXES

A. Reference Standards:
   1. Precast Concrete Handholes: Comply with ASTM C891 unless otherwise indicated.
   2. Consult Architect for resolution of conflicting requirements.

B. Special Techniques:
   1. Cast-in-Place Manholes:
      a. Finish interior surfaces with smooth-troweled finish.
      b. Knockouts for Future Duct Connections: Form and pour concrete knockout panels 1-1/2 to 2 inch (38 to 50 mm) thick, arranged as indicated.
      c. Comply with requirements in Section 033000 "Cast-in-Place Concrete" for cast-in-place concrete, formwork, and reinforcement.
   2. Precast Concrete Handholes and Manholes:
      a. Install units level and plumb and with orientation and depth coordinated with connecting duct to minimize bends and deflections required for proper entrances.
      b. Unless otherwise indicated, support units on level bed of crushed stone or gravel graded from 1 inch (25 mm) sieve to No. 4 (4.75 mm) sieve and compacted to same density as adjacent undisturbed earth.
      c. Field-cut openings for conduits in accordance with enclosure manufacturer's published instructions. Cut wall of enclosure with tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.
   3. Elevations:
      a. Manhole Roof: Install with rooftop at least 15 inch (375 mm) below finished grade.
      b. Manhole Frame: In paved areas and trafficways, set frames flush with finished grade. Set other manhole frames 1 inch (25 mm) above finished grade.
      c. Install handholes with bottom below frost line.
      d. Handhole Covers: In paved areas and trafficways, set surface flush with finished grade. Set covers of other handholes 1 inch (25 mm) above finished grade.
      e. Where indicated, cast handhole cover frame integrally with handhole structure.
   4. Drainage: Install drains in bottom of manholes where indicated. Coordinate with drainage provisions indicated.
   5. Manhole Access: Circular opening in manhole roof; sized to match cover size.
      a. Manholes with Fixed Ladders: Offset access opening from manhole centerlines to align with ladder.

b. Install chimney, constructed of precast concrete collars and rings, and cast-iron frame to connect cover with manhole roof opening. Provide moisture-tight joints and waterproof grouting for frame and chimney.

6. Hardware: Install removable hardware, including pulling eyes, cable stanchions, and cable arms, and insulators, as required for installation and support of cables and conductors and as indicated.
7. Fixed Manhole Ladders: Arrange to provide for safe entry with maximum clearance from cables and other items in manholes.
8. Field-Installed Bolting Anchors in Manholes and Concrete Handholes: Do not drill deeper than 3-7/8 inch (97 mm) for manholes and 2 inch (50 mm) for handholes, for anchor bolts installed in field. Use minimum of two anchors for each cable stanchion.
9. Ground manholes, handholes, and boxes in accordance with Section 260526 "Grounding and Bonding for Electrical Systems."

3.7 INSTALLATION OF HANDHOLES AND BOXES OTHER THAN PRECAST CONCRETE

A. Reference Standards:
1. Consult Architect for resolution of conflicting requirements.

B. Special Techniques:
1. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting duct, to minimize bends and deflections required for proper entrances. Use box extension if required to match depths of duct, and seal joint between box and extension as recommended by manufacturer.
2. Unless otherwise indicated, support units on level bed of crushed stone or gravel, graded from 1/2 inch (12.5 mm) sieve to No. 4 (4.75 mm) sieve and compacted to same density as adjacent undisturbed earth.
3. Elevation: In paved areas and trafficways, set cover flush with finished grade. Set covers of other handholes 1 inch (25 mm) above finished grade.
4. Install handholes and boxes with bottom below frost line.
5. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Select arm lengths to be long enough to provide spare space for future cables, but short enough to preserve adequate working clearances in enclosure.
6. Field cut openings for duct in accordance with enclosure manufacturer's published instructions. Cut wall of enclosure with tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.
7. For enclosures installed in asphalt paving and subject to occasional, nondeliberate, heavy-vehicle loading, form and pour concrete ring encircling, and in contact with enclosure entry, and with top surface screeded to top of box cover frame. Bottom of ring must rest on compacted earth.
   a. Concrete: 3000 psi (20 kPa), 28-day strength, complying with Section 033000 "Cast-in-Place Concrete," with troweled finish.
   b. Dimensions: 10 inch wide by 12 inch deep (250 mm wide by 300 mm deep) unless otherwise noted on drawings.
8. Ground handholes and boxes in accordance with Section 260526 "Grounding and Bonding for Electrical Systems."

3.8 FIELD QUALITY CONTROL

A. Tests and Inspections:
   1. Demonstrate capability and compliance with requirements on completion of installation of underground duct, duct bank, and utility structures.
   2. Pull solid aluminum or wood test mandrel through duct to prove joint integrity and adequate bend radii, and test for out-of-round duct. Provide minimum 12 inch (300 mm) long mandrel equal to duct size minus 1/4 inch (6 mm). If obstructions are indicated, remove obstructions and retest.
   3. Test manhole and handhole grounding to ensure electrical continuity of grounding and bonding connections. Measure and report ground resistance as specified in Section 260526 "Grounding and Bonding for Electrical Systems."

B. Nonconforming Work:
   1. Underground ducts, raceways, and structures will be considered defective if they do not pass tests and inspections.
   2. Correct deficiencies and retest as specified above to demonstrate compliance.

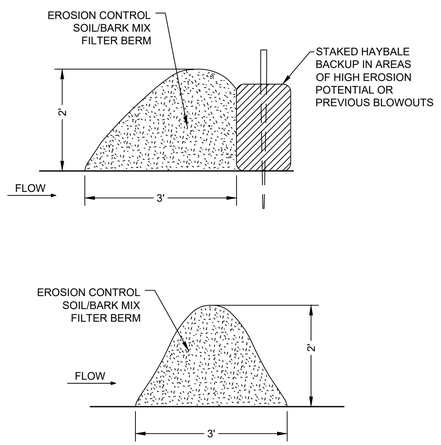
C. Field Quality-Control Reports: Collect, assemble, and submit test and inspection reports.

3.9 CLEANING

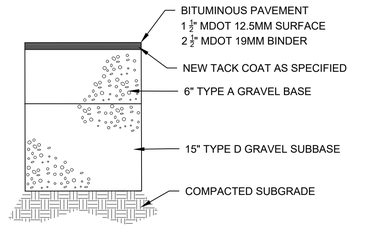
A. Pull leather-washer-type duct cleaner, with graduated washer sizes, through full length of duct until duct cleaner indicates that duct is clear of dirt and debris. Follow with rubber duct swab for final cleaning and to assist in spreading lubricant throughout ducts.

B. Clean internal surfaces of manholes, including sump, and building interiors affected by Work.
   1. Sweep floor, removing dirt and debris.
   2. Remove foreign material.

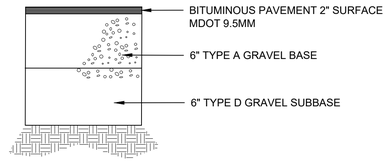
END OF SECTION 260543



B1 SEDIMENT FILTER BERM

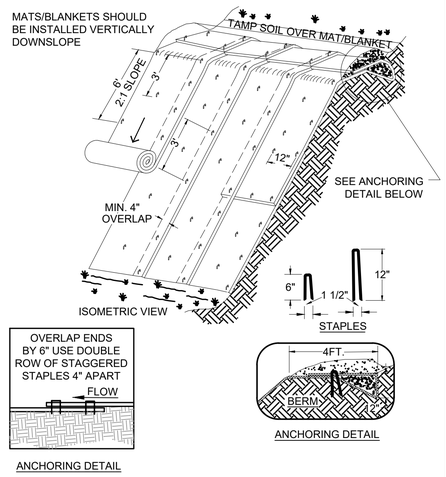


BITUMINOUS ROADS & PARKING

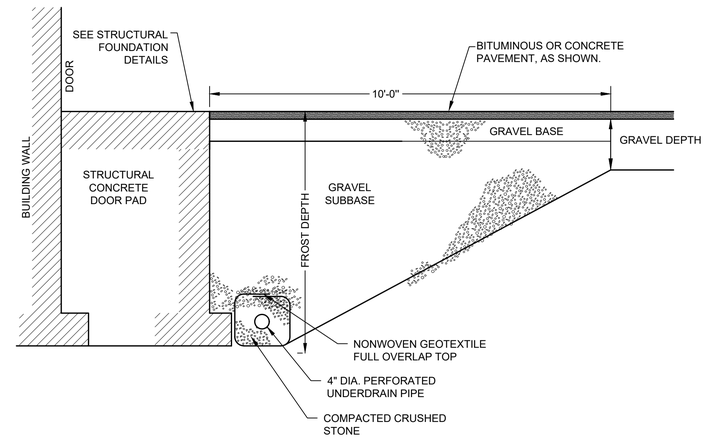


BITUMINOUS WALK

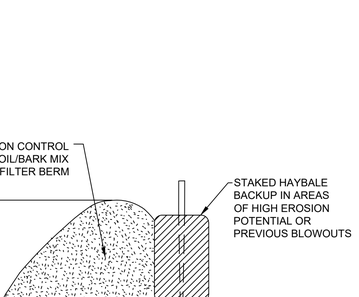
B2 BITUMINOUS PAVEMENT DETAILS
SCALE: N.T.S



B3 SLOPE EROSION CONTROL BLANKET
SCALE: N.T.S



B4 TYPICAL DOORWAY WALK SECTION
SCALE: N.T.S

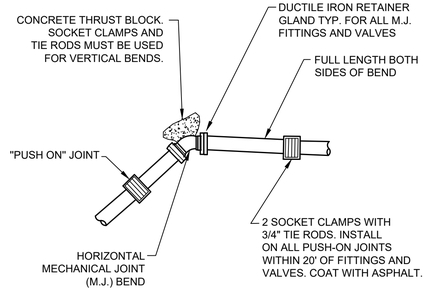


NOTES:
1. COORDINATE WITH UTILITY COMPANY
2. CONDUITS AND WIRING SUPPLIED AND INSTALLED BY DIV. 26.
3. NUMBER AND SIZE OF CONDUITS SHOWN ON ELECTRICAL PLANS

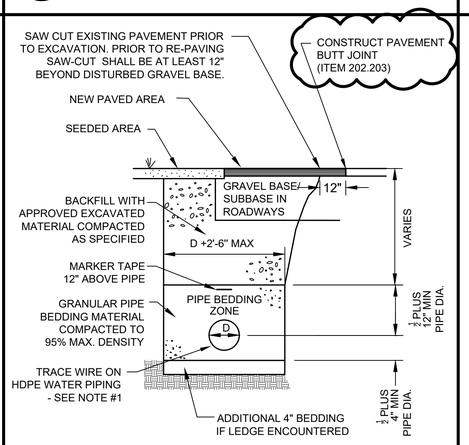
A1 LIGHTING CONDUIT AND GAS TRENCH
SCALE: N.T.S

GENERAL DATA FOR BLOCKING STANDARD FITTINGS
MINIMUM SURFACE AREA OF CONCRETE BLOCK AGAINST UNDISTURBED EARTH - SQ.FT.

PIPE SIZE	HYDRANT, PLUG, CAP, TEE	90° BEND	45° BEND	22.5° BEND	11.25° BEND
4"'	4	4	4	3 6	2
6"	8	10	10	12	3
8"	12	16	14	16	4
10"	18	26	20	20	5
12"	26	36	28		7
14"	36	50	36		9
16"	46	64			12

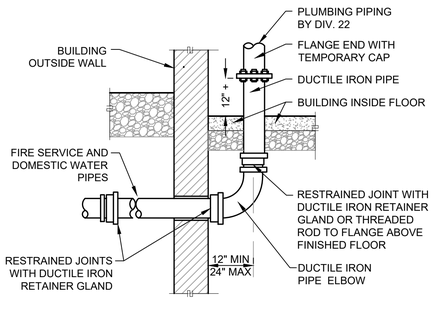


A2 RESTRAINT AT WATERLINE FITTINGS
SCALE: N.T.S



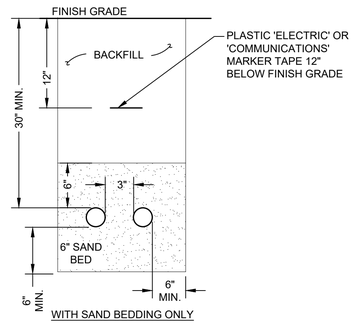
NOTE 1: #12 AWG COPPER CLAD STEEL TRACE WIRE TAPED TO LOWER HALF OF HDPE WATER PIPE CONTINUOUSLY.

A3 TYPICAL PIPE TRENCH
SCALE: N.T.S



NOTE: OPTION - PROVIDE STEEL THREADED ROD RESTRAINTS OUTSIDE WALL AND ON THE RISER THROUGH THE FLOOR.

A4 WATER SERVICE TERMINATION AT BUILDING
SCALE: N.T.S



NOTES:
1. CONDUITS AND WIRING SUPPLIED AND INSTALLED BY DIV. 26..
2. DESIGNATION, NUMBER AND SIZE OF CONDUITS SHOWN ON ELECTRICAL PLANS.
3. COMPACT SAND BEDDING AND EXCAVATED SOIL BACKFILL TO 95% MAXIMUM DRY DENSITY.
4. CONCRETE ENCASEMENT IS BY DIV.31. LOCATIONS, EXTENT OF ENCASEMENT, DEPTH, AND DIMENSIONS ARE SHOWN ON ELECTRICAL ENGINEERING PLANS, SPECIFICALLY E-70, E80 SERIES.

A5 TYP. DUCT BANK SECTION
SCALE: N.T.S

Scale:

No.	Revision	By	Date
1	ADDENDUM 2	CWB	11-24-2025

Designed by:

JON R. EARLE, P.E.
ISSUED FOR BID

STATE OF MAINE — JONATHAN ROBERT EARLE No. 10905 — LICENSED PROFESSIONAL ENGINEER

	By	Date		By	Date
Designed:	JRE	10-14-2025	Checked:	FLC	10-14-2025
Drawn:	CWB	10-14-2025			

PROJ.NO: 25116

Harriman

MAINE TURNPIKE

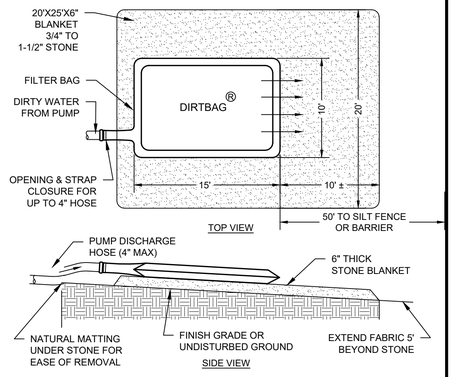
THE GOLD STAR MEMORIAL HIGHWAY

MTA PROJECT MANAGER: Brian A. Taddeo, P.E.

CONTRACT 2026.07
CROSBY MAINTENANCE OFFICE BUILDING

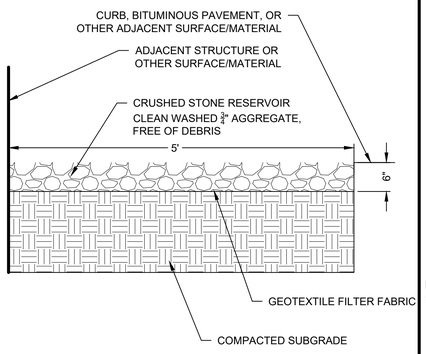
SITE DETAILS

SHEET NUMBER: C50-1



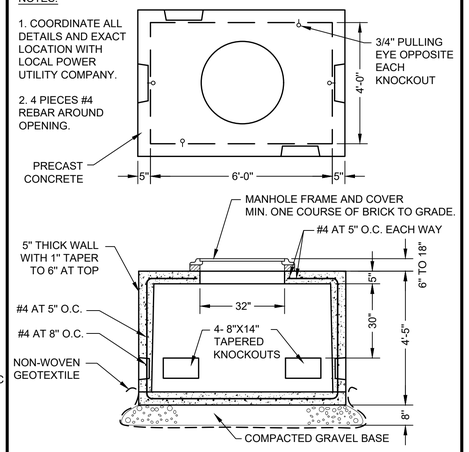
NOTE:
1. DIRT BAG MATERIAL BASED ON PARTICLE SIZE IN DIRTY WATER, I.E., FOR COARSE PARTICLES A WOVEN MATERIAL; FOR SILTS/CLAYS A NON-WOVEN MATERIAL.
2. DO NOT OVER PRESSURIZE DIRT BAG OR USE BEYOND CAPACITY.
3. LOCATE DISCHARGE SITE ON FLAT UPLAND AREAS AS FAR AWAY AS POSSIBLE FROM STREAMS, WETLANDS, OTHER RESOURCES AND POINTS OF CONCENTRATED FLOW.
4. DOWN GRADIENT RECEIVING AREA MUST BE WELL VEGETATED OR OTHERWISE STABLE FROM EROSION, E.G., FOREST FLOOR OR COARSE GRAVEL/STONE.
5. DISCHARGE NOT PERMITTED WITHIN 25' OF A STREAM OR WETLAND. CONSULT DEP IF STRUCTURE MUST BE WITHIN 75' OF A STREAM OR WATER BODY. SECONDARY CONTAINMENT MAY BE REQUIRED.

B1 PUMPED DISCHARGE SEDIMENT CONTROL DEVICE
SCALE: N.T.S

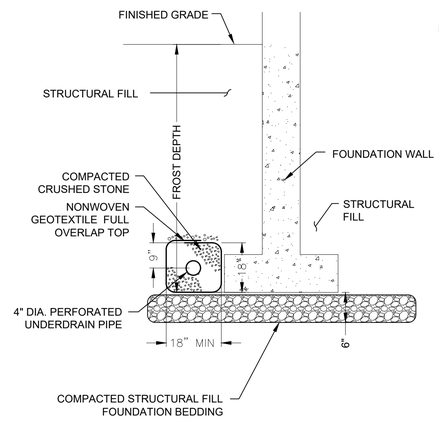


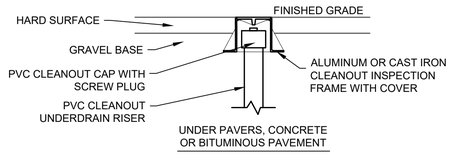
B2 CRUSHED STONE DRIP EDGE
SCALE: N.T.S

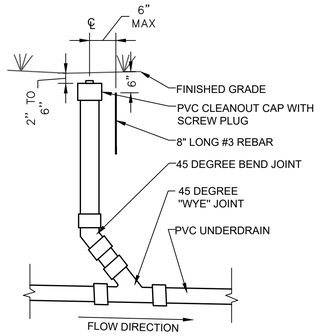
NOTES:
1. COORDINATE ALL DETAILS AND EXACT LOCATION WITH LOCAL POWER UTILITY COMPANY.
2. 4 PIECES #4 REBAR AROUND OPENING.



B3 P.I.C. CONCRETE ELECTRIC HANDHOLE
SCALE: N.T.S

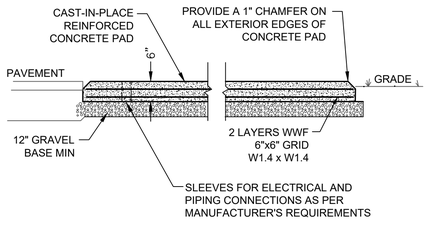




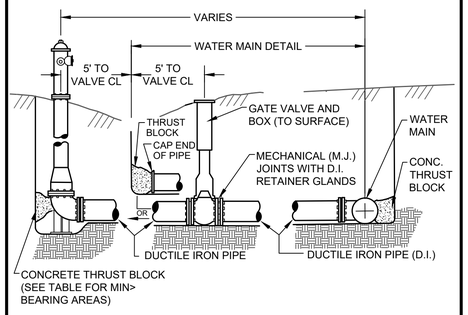


B4 FOUNDATION BEDDING & UNDERDRAIN
SCALE: N.T.S

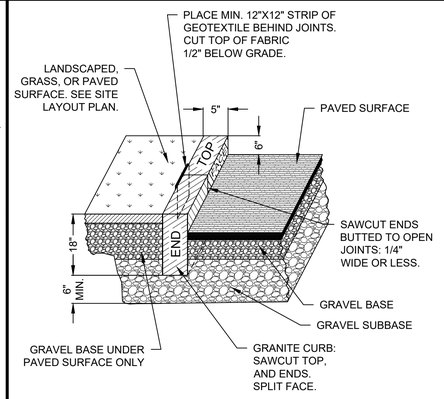
NOTE:
1. CAST-IN-PLACE CONCRETE FLATWORK MATERIAL, REINFORCEING, FORMING, PLACEMENT AND ASSOCIATED COMPOUNDS ARE COVERED UNDER DIVISION 03, AND NOT INCLUDED IN DIVISION 32. SITE GRADING, SOIL FILL MATERIALS, COMPACTION AND BELOW GRADE CONCRETE POSTS ARE INCLUDED IN DIVISIONS 31 & 32.
2. USE PRE-CAST CONCRETE PAD FOR PROPANE TANK.



A1 TYP. UTILITY EQUIPMENT PAD
SCALE: N.T.S

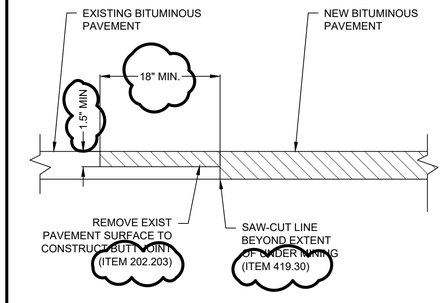


A2 WATER MAIN/FIRE HYDRANT
SCALE: N.T.S

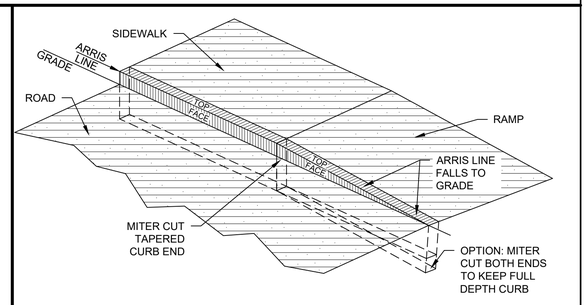


NOTE:
1. USE CURVED SECTIONS FOR CURB RADIUS OF 40' OR LESS.

A3 VERTICAL GRANITE CURBING: VGC
SCALE: N.T.S



A4 PAVEMENT JOINT DETAIL
SCALE: N.T.S



VERTICAL TAPERED CURB END

A5 TAPERED CURB END DETAIL (TCE)
SCALE: N.T.S

Scale:

No.	Revision	By	Date
1	ADDENDUM 2	CWB	11-24-2025

Designed by:
JON R. EARLE, P.E.
ISSUED FOR BID

STATE OF MAINE — JONATHAN ROBERT EARLE No. 10905 — LICENSED PROFESSIONAL ENGINEER

	By	Date		By	Date
Designed:	JRE	10-14-2025	Checked:	FLC	10-14-2025
Drawn:	CWB	10-14-2025			

Harriman

PROJ.NO: 25116

MAINE TURNPIKE

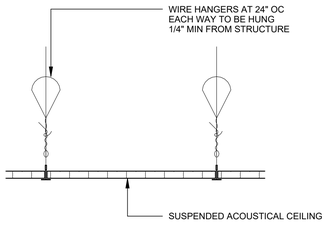
THE GOLD STAR MEMORIAL HIGHWAY

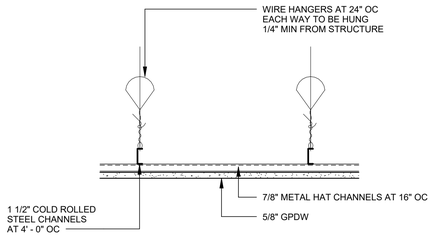
MTA PROJECT MANAGER: Brian A. Taddeo, P.E.

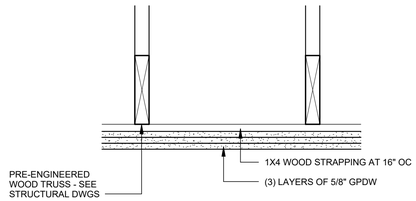
CONTRACT 2026.07
CROSBY MAINTENANCE OFFICE BUILDING

SITE DETAILS

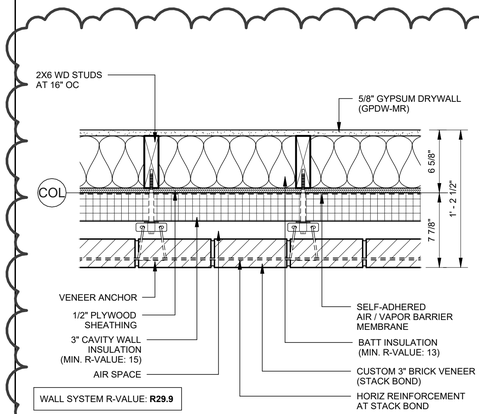
SHEET NUMBER: C50-2







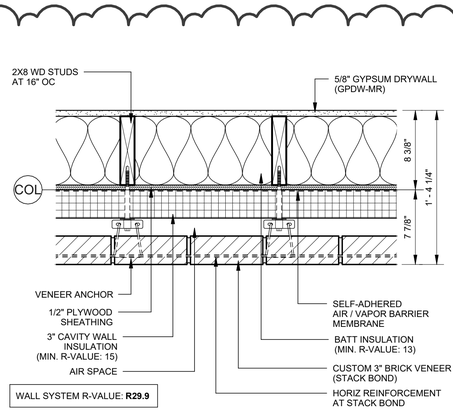
ACT ACOUSTICAL CEILING SYSTEM



WALL SYSTEM R-VALUE: **R29.9**

W02 ACCENT BRICK VENEER WITH 2X6 WD STUD BACKUP

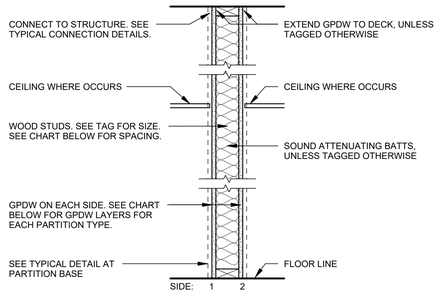
C1 SUSPENDED GPDW CEILING



WALL SYSTEM R-VALUE: **R29.9**

W12 ACCENT BRICK VENEER WITH 2X8 WD STUD BACKUP

CT RATED GPDW CEILING AT TRUSS

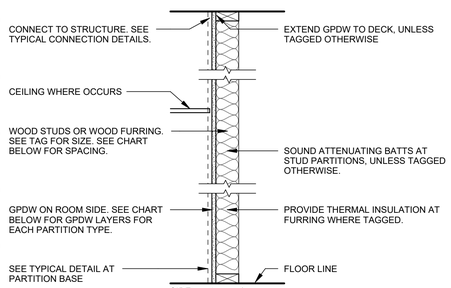


TYPE PREFIX	STUD SPACING	MIN STC	GPDW SIDE 1	GPDW SIDE 2
T	16" OC	36	(1) 5/8"	(1) 5/8"
TA	16" OC	41	(2) 5/8"	(2) 5/8"

AT RATED PARTITIONS, USE THE FOLLOWING UL SYSTEMS:

1 HR = U305
2 HR = U301 ("TA" ONLY)

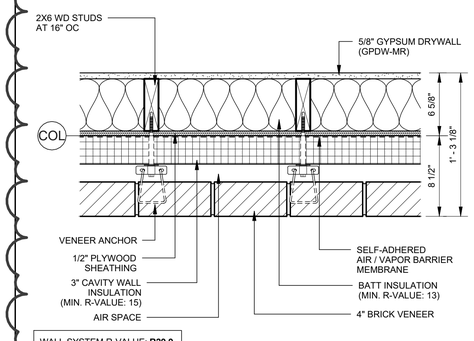
T TYPE T - WOOD STUD PARTITION



TYPE PREFIX	STUD SPACING	MIN STC	GPDW SIDE 1	GPDW SIDE 2
V	16" OC	34	(1) 5/8"	---
VA	16" OC	38	(2) 5/8"	---

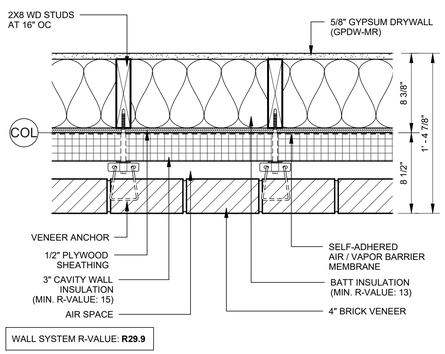
AT RATED PARTITIONS, USE THE FOLLOWING UL SYSTEMS:

1 HR = U305 ("VA" ONLY)



WALL SYSTEM R-VALUE: **R29.9**

W01 BRICK VENEER WITH 2X6 WOOD STUD BACKUP



WALL SYSTEM R-VALUE: **R29.9**

W11 BRICK VENEER WITH 2X8 WOOD STUD BACKUP

V TYPE V - WOOD FURRING OR CHASE PARTITION

PARTITION TAG KEY

1. PARTITION TYPE / SUBTYPE:

   ONE OR TWO LETTER PREFIX INDICATING TYPE DIAGRAM AND VARIATIONS:
   1ST LETTER: REFERS TO PARTITION TYPE DIAGRAM FOR WALL COMPOSITION
   2ND LETTER *(OPTIONAL)*: REFERS TO A VARIATION OF THE BASIC TYPE

2. PARTITION SIZE DESIGNATOR

FOR STEEL STUDS:	FOR METAL FURRING:	FOR SHAFTWALL:
1 = 1 5/8" STUD	0 = 7/8" METAL HATS	2 = 2 1/2" SHAFTWALL STUDS
2 = 2 1/2" STUD	1 = 1 1/2" ZEE FURRING	4 = 4" SHAFTWALL STUDS
3 = 3 5/8" STUD	2 = 2" ZEE FURRING	6 = 6" SHAFTWALL STUDS
6 = 6" STUD	3 = 3" ZEE FURRING	
8 = 8" STUD		
X = 10" STUD		FOR MASONRY (SINGLE UNIT SIZE)
FOR WOOD STUDS:	FOR WOOD FURRING:	2 = 11 5/8" CMU
4 = 2 x 4 STUD	1 = 1x FURRING	4 = 3 5/8" CMU OR BRICK
6 = 2 x 6 STUD	2 = 2x FURRING	6 = 5 5/8" CMU
8 = 2 x 8 STUD		8 = 7 5/8" CMU

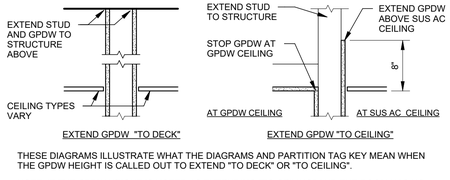
3. FIRE-RATING / SMOKE / HEIGHT OF GPDW (TOW) *(OPTIONAL TAG MODIFIER)*:

VALUE	RATING	GPDW SIDE 1	GPDW SIDE 2 *(IF APPLIES)*
BLANK	NO RATING	TO DECK	TO DECK
1	1 HOUR	TO DECK	TO DECK
2	2 HOUR	TO DECK	TO DECK
3	3 HOUR	TO DECK	TO DECK
4	4 HOUR	TO DECK	TO DECK
5	20 MINUTE	TO DECK	TO DECK
6	30 MINUTE	TO DECK	TO DECK
7	NO RATING	TO DECK	TO CEILING
8	NO RATING	TO CEILING	TO CEILING
9	UNDEFINED	---	---
S	0 HR SMOKE	TO DECK	TO DECK

SEE DIAGRAMS BELOW WHICH ILLUSTRATE THE HEIGHT OF GPDW CONDITIONS "TO DECK" AND "TO CEILING".

4. ADDITIONAL CONDITIONS *(OPTIONAL TAG MODIFIER)*:

   A = SUBSTITUTE ABUSE BOARD FOR GPDW
   B = SUBSTITUTE ABUSE BOARD FOR GPDW AND OMIT SAB FROM CAVITY
   H = SUBSTITUTE HIGH-IMPACT BOARD FOR GPDW
   J = SUBSTITUTE HIGH-IMPACT BOARD FOR GPDW AND OMIT SAB FROM CAVITY
   N = OMIT SOUND ATTENUATING BATTS (SAB) FROM CAVITY
   T = THERMAL INSULATION IN CAVITY



THESE DIAGRAMS ILLUSTRATE WHAT THE DIAGRAMS AND PARTITION TAG KEY MEAN WHEN THE GPDW HEIGHT IS CALLED OUT TO EXTEND "TO DECK" OR "TO CEILING".

NOTE: IF THE GPDW HEIGHT IS NOTED AS EXTENDING "TO CEILING" AND THE ROOM HAS NO CEILING, EXTEND THE GPDW "TO DECK".

PARTITION DIAGRAM NOTES:

1. **GENERAL:**

   A. NOT ALL PARTITION TYPES SHOWN ARE APPLICABLE TO THIS PROJECT. SEE PLANS FOR TYPES USED.

   B. SEE THE A40 SERIES SHEETS FOR TYPICAL PARTITION CONNECTION DETAILS AND PARTITION FIRE STOP DETAILS.

   C. SEE SECTIONS AND DETAILS FOR CONNECTIONS OTHER THAN THOSE SHOWN.

   D. IN THE PARTITION TYPE DIAGRAMS, SIDE "1" REFERS TO THE MAJOR TRAFFIC (CORRIDOR) OR ROOM SIDE OF A PARTITION. SIDE "2" REFERS TO THE MINOR TRAFFIC, ROOM OR CHASE SIDE.

   E. WHERE REFERRED TO IN THE NOTES AND DIAGRAMS, THE OVERALL WIDTH OF A STUD PARTITION IS TAKEN FROM THE OUTSIDE FACE OF GPDW TO OUTSIDE FACE OF GPDW (OR FACE OF FRAMING MEMBER WHERE EXPOSED ON THE CHASE SIDE). THE OVERALL WIDTH OF A MASONRY PARTITION IS THE UNIT WIDTH FOR SINGLE WYTHE WALLS, AND THE IS FROM THE OUTSIDE FACE OF MASONRY TO THE OUTSIDE FACE OF MASONRY FOR MULTIPLE WYTHE WALLS.

PARTITION GENERAL NOTES:

1. **GENERAL:**

   A. SEE PARTITION DIAGRAM NOTES FOR ADDITIONAL INFORMATION.

2. **FRAMING:**

   A. USE 20 ga STEEL STUDS IN PARTITIONS WITH ABUSE RESISTANT GPDW, TILE BACKER BOARD, STC RATED WALLS AND AS OTHERWISE SPECIFIED.

3. **GYPSUM BOARD:**

   A. ALL GPDW TO BE TYPE-X GPDW.

   B. IN TOILET ROOMS, KITCHENS AND DIRTY DISH WASHING AREAS, WITH GPDW WALLS, PROVIDE 5/8" MOLD RESISTANT GPDW IN LIEU OF GPDW ON ALL STUD PARTITIONS WITHIN THE ROOM. WHERE THE GPDW EXTENDS ABOVE THE ROOM CEILING, PROVIDE MOLD RESISTANT GPDW TO A MIN 8" ABOVE THE CEILING AND USE 5/8" GPDW TO THE TOP OF THE PARTITION.

   C. IN TOILET ROOMS WHERE GPDW CEILINGS ARE CALLED FOR, PROVIDE 5/8" MOLD RESISTANT GPDW ON STEEL STUD FRAMING.

   D. PROVIDE 5/8" MOLD RESISTANT GPDW FROM FLOOR TO ROOF OR FLOOR DECK ABOVE ON INSIDE FACE OF EXTERIOR WALLS.

   E. AT PARTITIONS WHERE 5/8" ABUSE RESISTANT GPDW IS NOTED SUCH AS IN CORRIDORS, STAIRS, HALLS, LOBBIES AND STORAGE ROOMS. THE INTENT IS FOR THE ABUSE BOARD TO BE ON THE TRAFFIC SIDE OF THE ROOM. THE ROOM SIDE OF THE PARTITION PROVIDE 5/8" GPDW OR 5/8" MOISTURE GPDW AS NOTED ELSEWHERE IN THESE NOTES.

   F. WHERE 5/8" ABUSE RESISTANT GPDW IS NOTED, EXTEND UP TO 8" ABOVE CEILING THEN USE 5/8" GPDW UP TO DECK AND SEAL TIGHT.

4. **FIRE-RATED PARTITIONS:**

   A. ALL FIRE-RATED PARTITIONS SHALL BE STENCILED ON THE WALL SURFACE JUST ABOVE THE CEILING LINE INDICATING THE PARTITIONS FIRE-RATING; "1 HR", "2 HR", ETC IN RED OR ORANGE PAINT ON EACH SIDE OF THE PARTITION, SMOKE PARTITIONS "SMOKE" IN GREEN PAINT.

   B. ALL PARTITIONS EXTEND TO UNDERSIDE OF FLOOR OR ROOF DECK. SEAL ALL PARTITIONS TO DECK FOR SMOKE & SOUND CONTROL. FILL ALL VOIDS BETWEEN TOP OF PARTITION AND DECK AS SPECIFIED AND DETAILED IN THE A40 SERIES SHEETS.

5. **SOUND RESISTANT PARTITIONS:**

   A. PROVIDE INSULATION FOR THE FULL DEPTH OF THE STUD CAVITY UNLESS OTHERWISE SHOWN OR SPECIFIED.

   B. PROVIDE INSULATION SUPPORT ANCHORS.

   C. STC VALUES IN THE PARTITION TYPE DIAGRAMS ARE THE MINIMUM REQUIRED FOR THE ASSEMBLY. ACTUAL STC WILL VARY WITH THE STUD CAVITY SIZE.

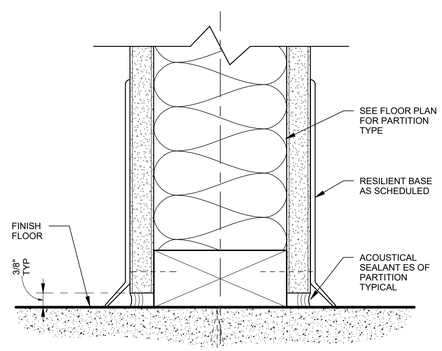
6. **MISCELLANEOUS:**

   A. WHERE GPDW & STUD PARTITIONS INTERSECT BEAMS OR JOIST, FRAME AROUND BOTH SIDES OF BEAMS & JOIST WITH METAL STUDS AND GPDW TO MAINTAIN CONTINUITY OF PARTITION TO UNDERSIDE OF DECK.

   B. WHERE CMU WALLS, RATED AND NON-RATED, INTERSECT BEAMS OR JOISTS, FRAME AROUND BOTH SIDES OF BEAMS OR JOIST WITH METAL STUDS AND GPDW TO MAINTAIN CONTINUITY OF PARTITION TO UNDERSIDE OF DECK.

   C. TOP OF PARTITION CLOSURE DETAILS SHOWN ARE TYPICAL. ACTUAL FIELD CONDITIONS MAY VARY. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ACTUAL CONDITIONS AND MODIFYING CLOSURE DETAILS TO MEET ACTUAL CONDITIONS AND MAINTAINING CONTINUITY OF PARTITIONS FROM FLOOR TO DECK ABOVE.

   D. PROVIDE 3/8" ACOUSTICAL SEALANT JOINT WITH CASING BEAD AROUND PERIMETER OF GPDW ASSEMBLIES WHEN ABUTTING DISSIMILAR MATERIALS UNLESS NOTED OR DETAILED ELSEWHERE IN THIS SET.



A1 TYPICAL BASE OF WALL DETAIL
SCALE: 6" = 1'-0"

Scale: As indicated

No.	Revision	By	Date
1	ADDENDUM 2		11-24-2025

Designed by: MARK LEE, AIA
ISSUED FOR BID

LICENSED ARCHITECT MARK D. LEE #3640 STATE OF MAINE

	By	Date		By	Date
Designed:	MDL	10-14-2025	Checked:	MDL	10-14-2025
Drawn:	JAE	10-14-2025			

PROJ.NO: 25116

Harriman

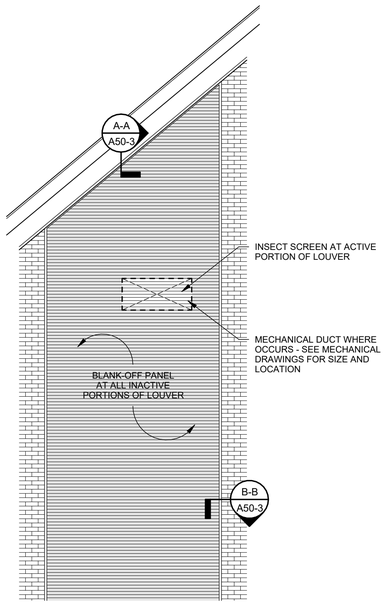
MAINE TURNPIKE

THE GOLD STAR MEMORIAL HIGHWAY

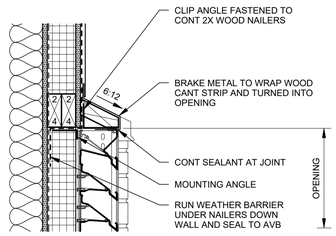
MTA PROJECT MANAGER: **Brian A. Taddeo, P.E.**

CONTRACT 2026.07
CROSBY MAINTENANCE OFFICE BUILDING
PARTITION LEGEND AND DETAILS

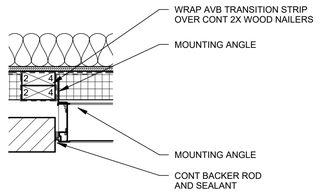
SHEET NUMBER: A40-1



ELEVATION DETAIL



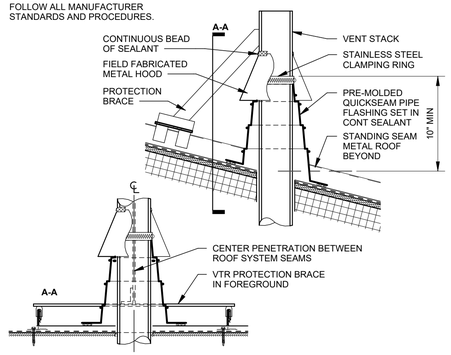
A-A LOUVER HEAD DETAIL



B-B LOUVER JAMB DETAIL

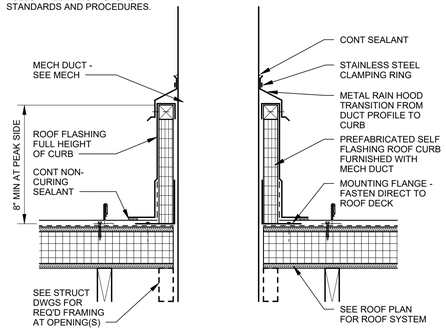
B1 LOUVER DETAILS
NO SCALE

NOTE:
FOLLOW ALL MANUFACTURER STANDARDS AND PROCEDURES.



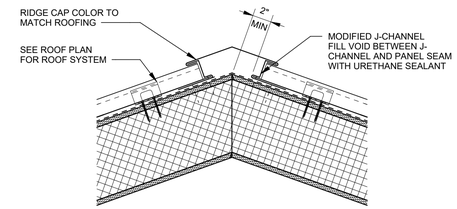
C1 VENT THROUGH ROOF DETAIL
SCALE: 1 1/2" = 1'-0"

NOTE:
FOLLOW ALL MANUFACTURER STANDARDS AND PROCEDURES.

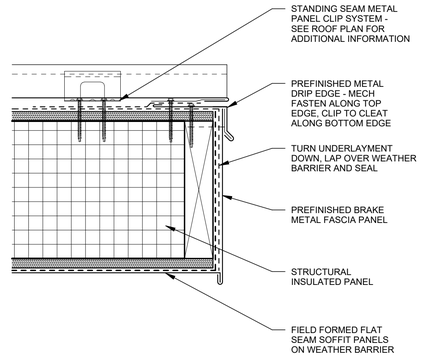


C2 EXHAUST THROUGH ROOF DETAIL
SCALE: 1 1/2" = 1'-0"

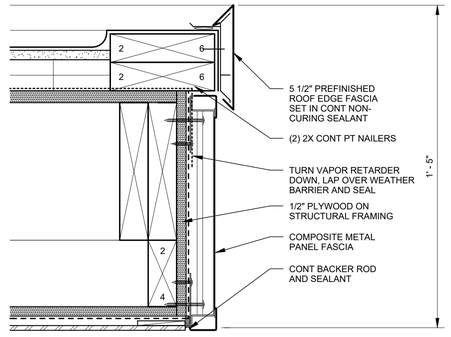
NOTE:
FOLLOW ALL MANUFACTURER STANDARDS AND PROCEDURES.



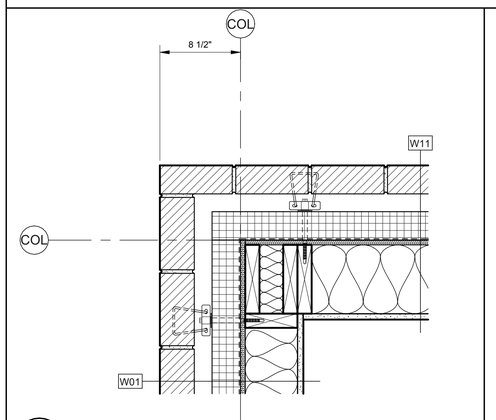
C3 RIDGE DETAIL
SCALE: 1 1/2" = 1'-0"



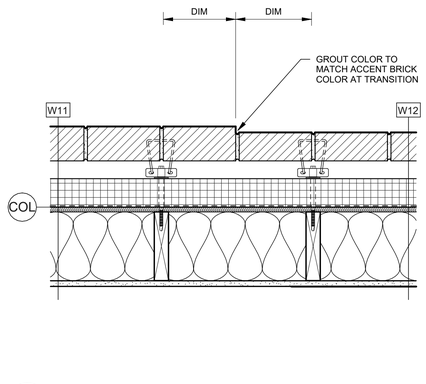
B2 ROOF EDGE DETAIL
SCALE: 3" = 1'-0"



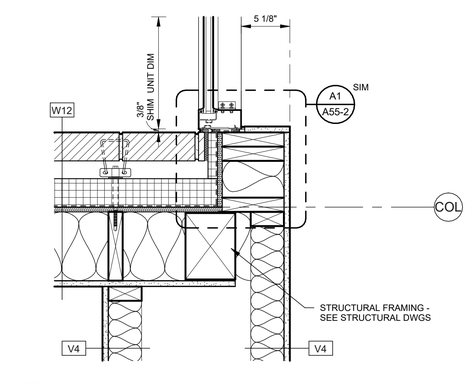
B3 CANOPY EDGE DETAIL
SCALE: 3" = 1'-0"



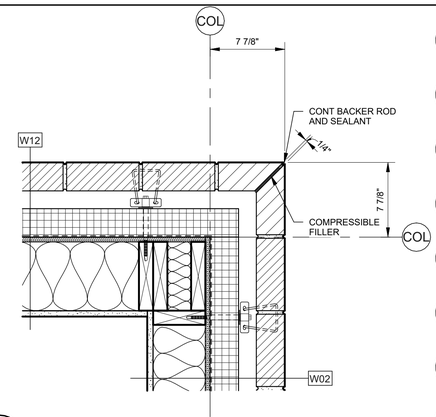
A1 PLAN DETAIL AT BRICK CORNER
SCALE: 1 1/2" = 1'-0"



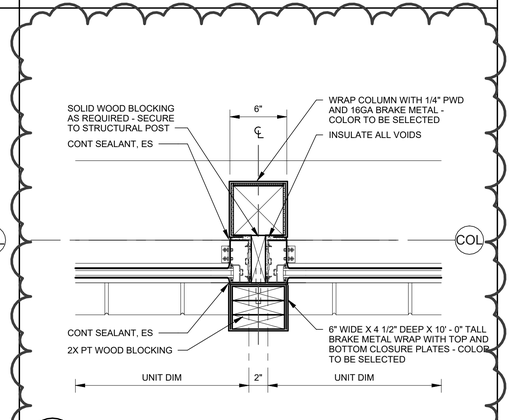
A2 PLAN DETAIL AT W02/W12
SCALE: 1 1/2" = 1'-0"



A3 PLAN DETAIL AT STOREFRONT
SCALE: 1 1/2" = 1'-0"



A4 PLAN DETAIL AT BRICK CORNER
SCALE: 1 1/2" = 1'-0"



A5 PLAN DETAIL AT STOREFRONT
SCALE: 1 1/2" = 1'-0"

Scale:
As indicated

No.	Revision	By	Date
1	ADDENDUM 2		11-24-2025

Designed by:
MARK LEE, AIA
ISSUED FOR BID

LICENSED ARCHITECT MARK D. LEE #3640 STATE OF MAINE

	By	Date		By	Date
Designed:	MDL	10-14-2025	Checked:	MDL	10-14-2025
Drawn:	JAE	10-14-2025			

PROJ.NO: 25116

Harriman

MAINE TURNPIKE

THE GOLD STAR MEMORIAL HIGHWAY

MTA PROJECT MANAGER: **Brian A. Taddeo, P.E.**

CONTRACT 2026.07
CROSBY MAINTENANCE OFFICE BUILDING
EXTERIOR DETAILS

SHEET NUMBER: A50-3

EXHAUST FAN INFORMATION – JOB#8138990

FAN UNIT NO	TAG	QTY	FAN UNIT MODEL #	MANUFACTURER	CFM	ESP	RPM	MOTOR ENCL	HP	BHP	PHASE	VOLT	FLA	DISCHARGE VELOCITY	WEIGHT (LBS)	SONES
1		1	USBI11DD-RM	CAPTIVEAIRE	800	1.000	1594	TEAO-ECM	1.000	0.2640	1	115	11.6	853 FPM	232	9.6

FAN ACCESSORIES

FAN UNIT NO	TAG	EXHAUST			SUPPLY			
		GREASE CUP	GRAVITY DAMPER	WALL MOUNT	SIDE DISCHARGE	GRAVITY DAMPER	MOTORIZED DAMPER	WALL MOUNT
1		YES						

FAN SOUND DATA

FAN UNIT NO	TAG	MOTOR	SOUND DATA			OCTAVE BAND SOUND DATA								
			LWA	SONES @ 5 FT	DBA @ 5 FT	DISTANCE (FT)	63 HZ	125 HZ	250 HZ	500 HZ	1 KHZ	2 KHZ	4 KHZ	8 KHZ
1		EXHAUST	72.1	9.592409507148785	60.6	5	69.4	76.8	74.2	70.4	66.2	61.1	55.1	49.1

FAN OPTIONS

FAN UNIT NO	TAG	QTY	DESCRIPTION
1		1	BI11 – INLET SERVICE DUCT CONNECTION. USED TO CONNECT TO STANDARD 12" GREASE DUCT OR FIELD WELDED DUCT. INCLUDES (2) 7" RISERS BOLTED TO STANDARD INLET RISER
		1	UTILITY SET GREASE CUP
		1	BI11 – INLET CONNECTION STANDARD 12" FLANGED GREASE DUCT
		1	FULL CRATING FOR EXHAUST FANS
		1	3 YEAR EXTENDED MOTOR WARRANTY
		1	BI – DISCHARGE ORIENTATION HORIZONTAL UPPER RIGHT – CW INLET SIDE
		1	BI11 – 12" DISCHARGE ADAPTER
		1	UTILITY SET – SPRING VIBRATION ISOLATORS – BI11 THRU BI15 / EQUIVALENT SIZED UTILITY SET – INDOOR/OUTDOOR USE
		1	ECM WIRING PACKAGE – PWM SIGNAL FROM ECPM03 PREWIRE (TELCO MOTOR), CCW ROTATION
		1	2 YEAR PARTS WARRANTY

No.	Revision	By	Date
1	ADDENDUM 2	ERD	11-24-2025

Scale:

Designed by:

DAVID STORY, P.E.
ISSUED FOR BID

STATE OF MAINE DAVID W. STORY No. 12853 LICENSED PROFESSIONAL ENGINEER

	By	Date		By	Date
Designed:	MSJ	10-14-2025	Checked:	MSJ	10-14-2025
Drawn:	ERD	10-14-2025			

PROJ.NO: 25116

Harriman

MAINE TURNPIKE

THE GOLD STAR MEMORIAL HIGHWAY

MTA PROJECT MANAGER: **Brian A. Taddeo, P.E.**

CONTRACT 2026.07
CROSBY MAINTENANCE OFFICE BUILDING
DETAILS

SHEET NUMBER: M50-7

NO LONGER USED -

DOAS UNIT REMOVED FROM PROJECT SCOPE

Scale:

No.	Revision	By	Date
1	ADDENDUM 2	ERD	11-24-2025

Designed by:

DAVID STORY, P.E.
ISSUED FOR BID

STATE OF MAINE
DAVID W. STORY
No. 12653
REGISTERED PROFESSIONAL ENGINEER

	By	Date		By	Date
Designed:	DWS	10-14-2025	Checked:	DWS	10-14-2025
Drawn:	ERD	10-14-2025			

Harriman

MAINE TURNPIKE

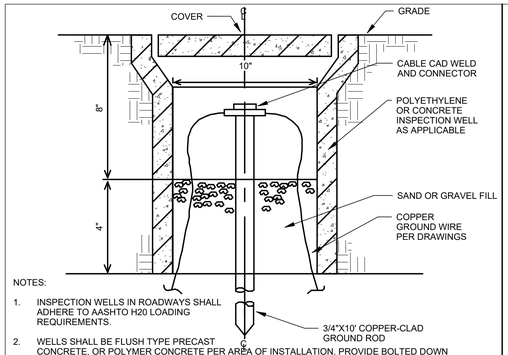
THE GOLD STAR MEMORIAL HIGHWAY

PROJ.NO: 25116

MTA PROJECT MANAGER: **Brian A. Taddeo, P.E.**

CONTRACT 2026.07
CROSBY MAINTENANCE OFFICE BUILDING
DETAILS

SHEET NUMBER: M50-9

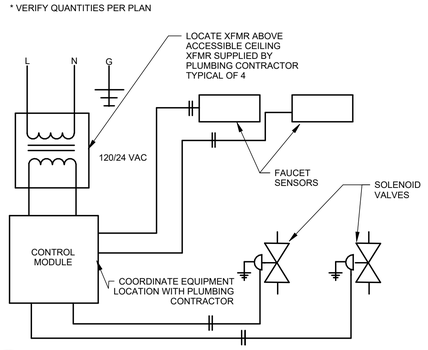


NOTES:

1. INSPECTION WELLS IN ROADWAYS SHALL ADHERE TO AASHTO H20 LOADING REQUIREMENTS.
2. WELLS SHALL BE FLUSH TYPE PRECAST CONCRETE, OR POLYMER CONCRETE PER AREA OF INSTALLATION. PROVIDE BOLTED DOWN COVERS WITH DESCRIPTION "GROUND ROD". PROVIDE STEEL COVERS FOR WELLS IN TRAFFIC AREAS.

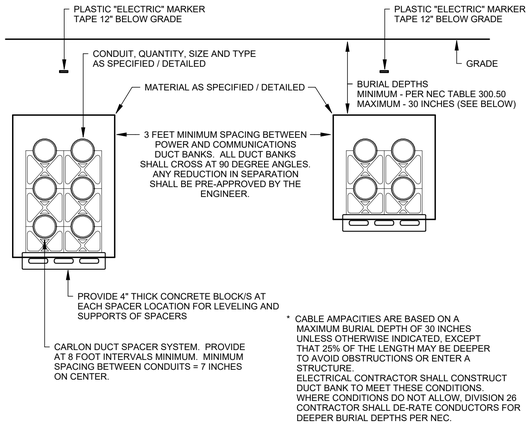
A10 TYPICAL GROUNDING WELL DETAIL

NO SCALE



A8 RESTROOM LAVATORY WIRING DETAIL

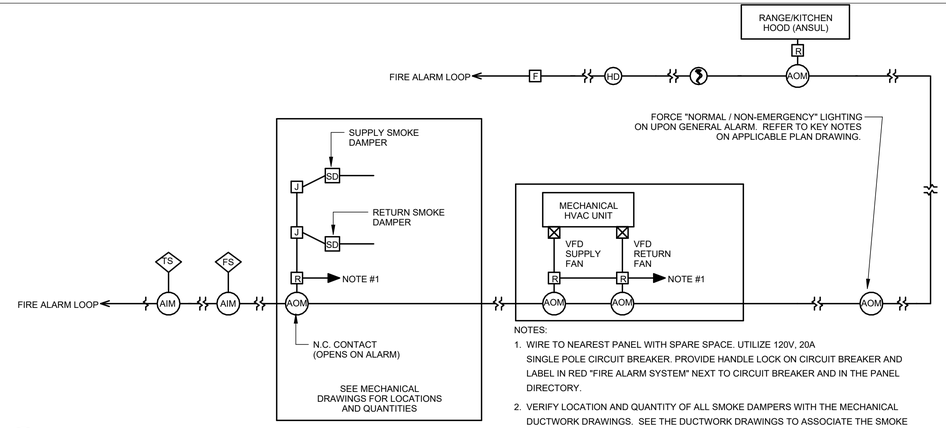
NO SCALE



* CABLE AMPACITIES ARE BASED ON A MAXIMUM BURIAL DEPTH OF 30 INCHES UNLESS OTHERWISE INDICATED, EXCEPT THAT 25% OF THE LENGTH MAY BE DEEPER TO AVOID OBSTRUCTIONS OR ENTER A STRUCTURE.
ELECTRICAL CONTRACTOR SHALL CONSTRUCT DUCT BANK TO MEET THESE CONDITIONS. WHERE CONDITIONS DO NOT ALLOW, DIVISION 26 CONTRACTOR SHALL DE-RATE CONDUCTORS FOR DEEPER BURIAL DEPTHS PER NEC.

A7 TYPICAL DUCT BANK CONSTRUCTION

NO SCALE

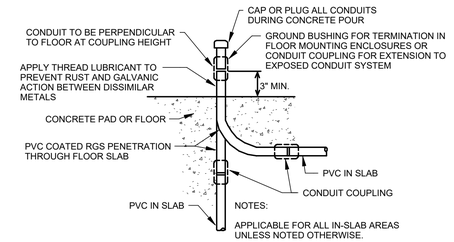


NOTES:

1. WIRE TO NEAREST PANEL WITH SPARE SPACE. UTILIZE 120V, 20A SINGLE POLE CIRCUIT BREAKER. PROVIDE HANDLE LOCK ON CIRCUIT BREAKER AND LABEL IN RED "FIRE ALARM SYSTEM" NEXT TO CIRCUIT BREAKER AND IN THE PANEL DIRECTORY.
2. VERIFY LOCATION AND QUANTITY OF ALL SMOKE DAMPERS WITH THE MECHANICAL DUCTWORK DRAWINGS. SEE THE DUCTWORK DRAWINGS TO ASSOCIATE THE SMOKE DAMPERS WITH EACH AIR HANDLING UNIT FOR GROUPING. SMOKE DAMPERS SHALL BE CONTROLLED AS A GROUP PER AIR HANDLING UNIT SERVED.

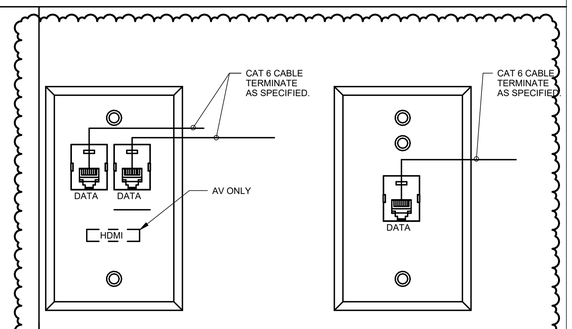
A9 FIRE ALARM SYSTEM DETAILS AND NOTES

NO SCALE



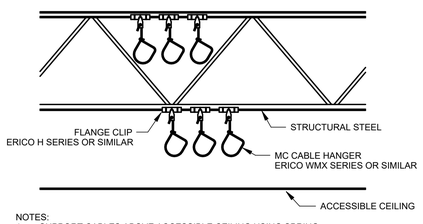
A6 TYPICAL IN-SLAB CONDUIT STUB-UP DETAIL

NO SCALE



A11 DATA FACEPLATES

SCALE: 1 1/2" = 1'-0"

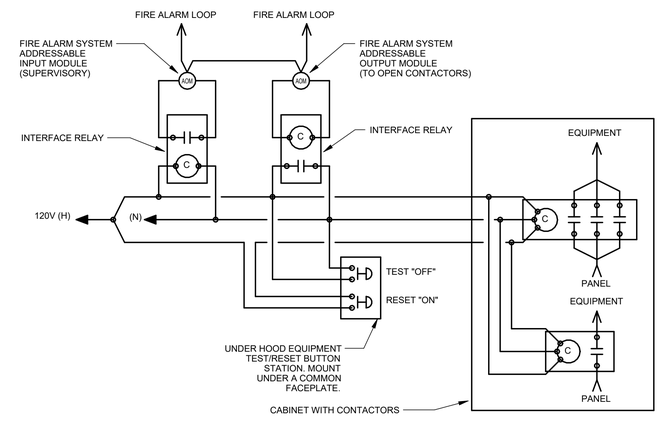


NOTES:

1. SUPPORT CABLES ABOVE ACCESSIBLE CEILING USING SPRING METAL CLIPS OR APPROVED CABLE TIES TO SUPPORT CABLES FROM STRUCTURE
   - DO NOT SUPPORT FROM CEILING SUSPENSION SYSTEM.
   - DO NOT DRAPE OVER DUCTWORK OR BETWEEN/THROUGH BAR JOIST.
   - DO NOT REST CABLE ON CEILING PANELS.
2. CABLING SHALL BE RUN PARALLEL AND PERPENDICULAR TO STRUCTURE AND SHALL BE CABLED NEATLY.

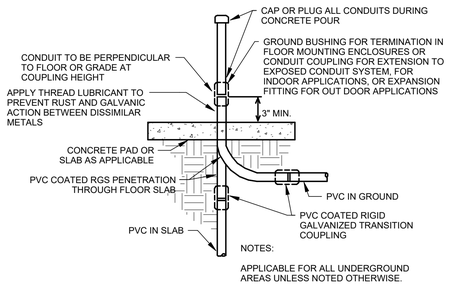
A4 MC CABLE MOUNTING SUPPORT DETAIL

NO SCALE



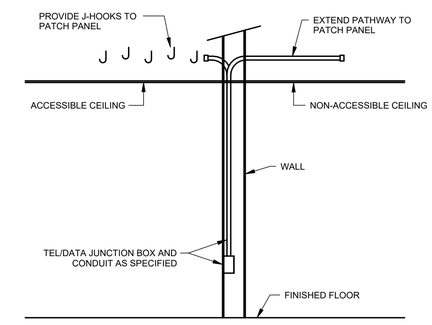
A3 UNDER HOOD KITCHEN EQUIPMENT SHUTDOWN DETAIL

NO SCALE



A2 TYPICAL U/G CONDUIT STUB-UP DETAIL

NO SCALE



NOTE:
PROVIDE BLANK FACEPLATES ON ALL DEVICE BOXES NOT ACTIVATED.

A1 TYPICAL WALL OUTLET DETAIL

NO SCALE

Scale: As indicated

No.	Revision	By	Date
1	ADDENDUM 2		11-24-2025

Designed by: CHELSEA HADSEL, P.E.
ISSUED FOR BID

STATE OF MAINE — CHELSEA L. HADSEL No. 17097 — LICENSED PROFESSIONAL ENGINEER

	By	Date		By	Date
Designed:	CLH	10-14-2025	Checked:	CLH	10-14-2025
Drawn:	CLH	10-14-2025			

PROJ.NO: 25116

Harriman

MAINE TURNPIKE

THE GOLD STAR MEMORIAL HIGHWAY

MTA PROJECT MANAGER: **Brian A. Taddeo, P.E.**

CONTRACT 2026.07
CROSBY MAINTENANCE OFFICE BUILDING
DETAILS

SHEET NUMBER: E70-2