FROM: Allied Engineering, Inc.
160 Veranda Street
Portland, Maine 04103
Telephone: (207) 221-2260

TO: Prospective Bidders, Suppliers, and Other Parties

RE: Addendum No**. One (1)** to the Bidding Documents for:

NEW Crosby Vehicle Storage Garage, South Portland, ME

This Addendum forms a part of the Contract Documents and modifies the original Bidding Documents dated November 22, 2021. Acknowledge receipt of this Addendum in the space provided on the Proposal Form. Failure to do so may subject Bidder to disqualification.

GENERAL

1. Pre-Bid Attendees list attached dated November 30, 2021.
2. Pre-Bid Meeting Minutes dated November 30, 2021.

CONTRACTOR QUESTIONS/RESPONSES - Attached

SPECIFICATIONS

1. Notice to Contractors, **DELETE** this section. **ADD** in its place Notice to Contractors, Revised December 3, 2021 – Addendum 1 (Attached) in its entirety.

2. Part II Special Provisions. **DELETE** this section. **ADD** in its place Part II Special Provisions, Revised December 3, 2021 – Addendum 1 (Attached) in its entirety.

3. Section 011000 – SUMMARY, **DELETE** this section. **ADD** in its place Part II Special Provisions Revised December 3, 2021 – Addendum 1 (Attached) in its entirety.

4. Section 083613 – SECTIONAL DOORS. **ADD** Section 083613 SECTIONAL DOORS Issued December 3, 2021 – Addendum 1 (Attached) in its entirety.

5. Section 133419 – METAL BUILDING SYSTEMS. **DELETE** this section. **ADD** in its place Section 133419 – METAL BUILDING SYSTEMS Revised December 7, 2021 – Revised Addendum 1 (Attached) in its entirety.

PLANS SHEETS & SKETCHES

1. Drawing A-7 DETAILS, **DELETE** this drawing. **ADD** Drawing A-7 DETAILS Revised December 3, 2021 – Addendum 1in its place.

ATTACHMENTS

A.	Addendum Summary Document	(1 Page)
B.	General	(4 Pages)
C.	Contractor Questions/Response Table	(1 Page)
D.	Specifications	(63 Pages)
E.	Plan Sheets and Sketches	(1 Pages)
	Total Page Count	**70 Page**

Allied Engineering
Structural Mechanical Electrical Plumbing

PRE-BID MEETING SIGN IN SHEET

Date: **November 30, 2021**

Project: **New Crosby Vehicle Storage Garage, South Portland, ME**

Name	Representing	Phone	Cell phone & E-mail
DAVID WHITNEY	SHERIDAN	207 453-9311	C-207-240-2269 dwhitney@sheridancorp.com
Jackson Swann	Sheridan	207 453-9311	JSwann@sheridancorp.com
Sam Rush	Benchmark	229-0459	srush@benchmarkconstruction.org
ANTHONY MANCINI	MANCINI ELECTRIC	207-774-5829	AMancini@mancinielectric.com
AL Palmer	Gorrill Palmer	207-772-2515	agalmer@gorrillpalmer.com
BRIAN TADDEO	MTA	207-482-8297	btaddeo@maineturnpike.com
Nate Carll	MTA	207-482-8115	ncarll@maineturnpike.com
Steve Tartre	MTA	207 871-7771 ext 144	Startre@maineturnpike.com
MIKE HAYS	GRANT HAYS ASSOC	207.871.5900	mike@granthays.com
Jamie Mason	MTA	482-8172	Jmason@maineturnpike.com
Scott Wardl	MTA	482-821	swardl@maineturnpike.com
Jim Roy	Great Falls	653-1782	jroy@greatfallsme.com

Please return this sheet to Bill Faucher @ Allied engineering, Inc.

Allied Engineering
Structural Mechanical Electrical Plumbing

PRE-BID OUTLINE

PRE-BID MEETING NUMBER: Meeting Date: November 30, 2021

AEI PROJECT NUMBER: AEI20019

Project Name: New MTA Crosby Vehicle Storage Building

Project Location: South Portland, ME

N:\Projects\2020\20019 ~ MTA Crosby\2 Bidding\4 Pre-bid Mtg\MTA CROSBY_PRE.BID OUTLINE.doc

The Pre-Bid meeting for the above referenced project was conducted at the project site. See the attached sign in sheet for the individuals/firms in attendance.

These minutes will be recorded and published by **Allied Engineering, Inc.**

1. Pre-Bid Meeting Outline

A. Introductions:
   1. Refer to sign-up sheet for Attendees.

B. Project contact personnel
   1. MTA, Nate Carll, Purchasing Manager, ncarll@maineturnpike.com

C. Shop drawings must have a letter of transmittal.

D. MTA Resident Engineer: **TBD**

E. MTA Owners' Representative: MTA James Mason, Construction Project Manager, jmason@maineturnpike.com

F. Contractor will be required to submit prior to and for inclusion with the contract documents, the following:

   1. Contract and insurance certificates

   2. Builders risk by owner

   3. Pay down schedule

   4. Schedule of values

   5. Anticipated Project Gantt schedule identifying project Critical Path Elements and including full project schedule timeline. This will be required to be submitted for each of the identified Owner-Contractor progress meeting.

   6. GC Representatives for the Project and a list of subcontractors.

7. GC superintendent

G. Contractor shall be prepared during construction for:

1. Payment of material stored off site Procedures.
   i. Right of Entry
   ii. Insurance coverage for materials stored.

2. Record drawings shall be provided per requirements identified in the Contract Specifications.

3. RFI and Shop Logs shall be maintained.

4. Progress meetings will be recorded by the contractor.

5. Method of payment – 15th of the month review pay requisitions, final requisition prior to last day of each month.

6. Changes in contract. AEI will issue ASI for any change of scope value and timeline request. Contractor will formalize a response and issue as a Requested Change Order (RCO)

H. Request for inspection shall be made by Contractor with sufficient time allowed for AEI Team to schedule the site visit.

I. Substantial Completion: Identified in the contract documents as ~~December 23, 2022~~. August 18, 2023 Description provided in specifications as to what shall be completed.

J. Final Completion: Identified in the contract documents as ~~January 13, 2023~~ September 8, 2023 and shall result in full turnover of building and site to MTA.

K. Addendums will be issued as follows and require questions to received no later than the dates noted below to be considered.

i. Addendum #1 will be available End of Day, December 3, 2021; Questions must be received prior to 4:00 on December 1, 2021

ii. Addendum #2 will be available End of Day, December 17, 2021; Questions must be received prior to 4:00 on December 15, 2021

iii. Addendum #3 will be available End of Day, January 5, 2021; Questions must be received prior to 4:00 on January 3, 2021

L. Visiting the site is available: Please contact Steve Tartre startre@maineturnpike.com.

M. Free toll passage, strobes on construction and employee vehicles, Shaw brothers will be gone from the site by construction start.

N. Delivery trucks need to have a strobe or escorted to access for delivery to site.

O. All registered plan holders plus those on the pre-bid sign in sheet will be notified of the Addendum documents.

2. Sub-contractors can submit questions direct to MTA for response during bid only, otherwise thru GC during construction. All RFI questions shall be directed to Nate Carll, Purchasing Manager, ncarll@maineturnpike.com.

P. The Bid due date for this project has been revised to 10:00 AM January 11, 2022. See revised Notice to Contractors, Addendum 1.

End of Pre-bid Minutes

MTA Crosby_Addenda Questions - Contract 2021.06 ADDENDUM 1

		3-Dec-21			
		Crosby Vehicle Storage :Building			
	Contractor/Vendor	Sheet	Plan/Spec	Question	AEI Team Response/Resolution
1	Doten Construction			Is there a certain metal siding you are looking to have for this building? It states flush panel but I believe most maine turnpike buildings are the same siding? I looked back at old turnpike bids and they were a screw on siding and this says concealed fasteners. Is it possible to get a manufacturer and profile?	AEI: See revised specification section 133419 for Wall panel Basis of Deisgn requirements, attached to this Addendum 1.
2	Sheridan Corp.			An extension of the bid date is requested – 3 weeks is not enough time to solicit adequate pricing. December 21 is requested.	AEI: Bid due date has been revised to 10:00 AM on January 11, 2022. Please refer to Addendum 1 revision to the Notice to Contractors, revision to Section II Special Provisions and the Pre-bid meeting minutes for revised dates associated with bid due dates, addenda schedule, and revised Substantial and Fianl Completion dates.
3				With the long-lead time of pre-engineered building components, can the substantial completion date be extended? Most manufacturers are currently 8 – 10 months delivery from a clear order, which must go through the typical submittal process prior to submitting. Additionally, some components that are subject to supply-chain issues have been causing delays on some building components (not only the steel), thus delaying the entire project.	
4				The portal frame bracing (2-bays required) do not leave sufficient space for a 16' wide overhead door in those two bays. Clear space between the portal frames is only 13'-11", leaving room for 12' wide doors in those two bays.	AEI: The portal frames shall be made to fit in the availabe space between door openings. Resizing of doors and space between is not a option. However, if it is necessary to provide additional frames in this wall line to facilitate placement in the alotted space, AEI takes no exception to this consideration.
5				Is this project tax exempt?	AEI: Project is Tax Exempt
6				Section 011000, 1.3, A., 1., c., 3) describes ceramic tile at the toilet and shower rooms. The project documents do not show toilet or shower rooms and the finish schedule references no tile. Is there any tile associated with this project?	AEI: See revised, attached Section 011000
7				Section 107.1.1 of the Special Provisions references a "Schedule of Liquidated Damages". I could not locate this schedule. Please clarify what the liquidated damages are for this project.	AEI: The LD tables on in the Supplementals on page 95. The Supplemental Specifications are not included in these contract documents but are available at MaineTurnpike.com for download.
9	Great Falls Construction			Can we get a spec for the overhead doors	AEI: Section 083613 included in Addendum 1
10				Drawing A-5 shows the rigid at the kicker wall to be R-15 which would be a 3" XPS. Drawing A-7 shows a 2" with an R10. Can you clarify what will be required	AEI: Revised sheet A-7 provided in Addendum 1 to address this question.
11				SP-7 on page 23 of the specifications is asking for liquidated damages but I don't see a schedule for what they would be. Can we get clarification.	AEI: The LD tables on in the Supplementals on page 95. The Supplemental Specifications are not included in these contract documents but are available at MaineTurnpike.com for download.
12				Detail 3 on drawing A-5 shows the windows as aluminum, Drawing A-6 and Specification 085313 shows a vinyl window, can you clarify	AEI: Revised sheet A-7 provided in Addendum 1 to address this question.
13				Special Provision Section 800.1 Description is asking for the contractor to generate coordinated drawings, can you clarify what will be required.	AEI: See revised Special Provisions Section. This will not be required.
14				Can you disclose the name of the propane supplier for the existing facility	AEI: Dead River
18	Mancini Electric			Specification section 260923 Lighting Control Devices, this section refers to lighting controls not identified within the electrical plans provided. Lighting within the space is shown to be operated with standard switching devices.We just want to receive verification automated lighting controls are not required for the interior lighting.	AEI: The photoelectric switches referred to in the lighting control devices spec are indicated in the luminaire schedule for the exterior lighting. Interior controls are as shown on the lighting plan.
19	Glidden Paving			Will hot rubber joint sealant be required for the pavement joints?	AEI: NO, this is not necessary.

End Addendum #1

MAINE TURNPIKE AUTHORITY

NOTICE TO CONTRACTORS

Sealed proposals will be received by the Maine Turnpike Authority for:

CONTRACT 2021.06

Revised December 3, 2021 – Addendum 1

NEW CROSBY VEHICLE STORAGE GARAGE

at the office of the Maine Turnpike Authority, 2360 Congress Street, Portland, ME, until 10:00 AM, prevailing time as determined by the Authority on ~~December 14, 2021~~ **January 11, 2022** at which time and place the Proposals will be publicly opened and read. Bids will be accepted from Contractors prequalified by the Maine Department of Transportation for Building Construction Projects. All other bids may be rejected.

Contractors not currently prequalified by MaineDOT for Building projects can seek prequalification for this project prior to the award by submitting the prequalification application included with this notice directly to the Authority at the above address. Contractors not currently prequalified by MaineDOT for Building Projects or Contractors not prequalified by the MTA for Building projects may not be awarded a contract for this project.

This Project includes a wage determination developed by the State of Maine Department of Labor.

The work consists of the following:

1. Construction of an approximate 8,800 square foot pre-engineered building consisting of eight (8) vehicle storage garage bays.

2. All site work, paved parking and facility operation areas, generator, power utility services and site utilities.

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.

Plans and Contract Documents may be examined by prospective Bidders weekdays between 8:00 a.m. and 4:30 p.m. at the office of the Maine Turnpike Authority, 2360 Congress St., Portland, ME 04102. The Plans and Contract Documents may be obtained from the Authority upon payment of **One Hundred Fifty Dollars and Zero Cents ($150.00)** Dollars for each set, which payment will not be returned. Checks shall be made payable to: Maine Turnpike Authority.

For general information regarding Bidding and Contracting procedures, contact:

Nathaniel F. Carll, Purchasing Manager
Maine Turnpike Authority
2360 Congress Street, Portland, ME 04102.
Phone: (207) 482.8115; Email: ncarll@maineturnpike.com.

For information regarding Schedule of Items, plan holders list and bid results, visit our [i]website at https://www.maineturnpike.com/Projects/Construction-Contracts.aspx. Responses will not be prepared for questions received by telephone. Bidders shall not contact any other Authority staff or Consultants for clarification of Contract provisions, and the Authority will not be responsible for any interpretations so obtained.

All work shall be governed by the Specifications entitled "State of Maine, Department of Transportation, Standard Specifications, Revision of March 2014", "Standard Details, Revision of March 2014" and "Best Management Practices for Erosion and Sediment Control", latest issue. Copies and recent updates to these publications can be downloaded at: http://www.maine.gov/mdot/contractors/publications/

Proposals must be accompanied by an original bid bond, certified or cashier's check payable to the Maine Turnpike Authority in an amount not less than Five (5%) Percent of the Total Amount in the Proposal, but not less than $500.00. The Bidder to whom a Contract is awarded will be required to furnish a Surety Corporation Bond, satisfactory to the Authority, on the standard Contract Bond form of the Authority, for a sum not less than the Total Amount of the Proposal.

Proposals must be made upon the Proposal Forms furnished by the Authority separately with the Contract Documents and must be enclosed in the sealed special addressed envelope provided therefore bearing the name and address of the Bidder, the name of the Contract, and the date and time of Proposal opening on the outside.

A pre-bid meeting will be held on **November 30, 2021** at **10:00 a.m.** at the office of the Maine Turnpike Authority, 2360 Congress St., Portland, ME. This pre-bid meeting is not required, but it is recommended.

The Authority reserves the unqualified right to reject any or all Proposals and to accept that Proposal which in its sole judgment will under all circumstances serves its best interest.

Very truly yours,

MAINE TURNPIKE AUTHORITY

_____

Nathan Carll
Purchasing Manager
Maine Turnpike Authority,
Portland, Maine

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MAINE TURNPIKE AUTHORITY

SPECIFICATIONS

PART II – SPECIAL PROVISIONS

NEW CROSBY VEHICLE STORAGE GARAGE

~~November 22, 2021~~

Revised December 3, 2021 – Addendum 1

CONTRACT 2021.06

MAINE TURNPIKE AUTHORITY

SPECIFICATIONS

PART II - SPECIAL PROVISIONS

All work shall be governed by the Maine Department of Transportation Standard Specifications, Revision of March 2014, except for that work which applies to sections of the Maine Department of Transportation Standard Specifications which are amended by the Maine Turnpike Supplemental Specifications and the following modifications, additions and deletions.

General Description of Work

NEW VEHICLE STORAGE GARAGE:

a. The building is anticipated to be a high-bay vehicle storage garage. The main floor being a concrete slab-on-grade, and generally constructed of durable and appropriate materials. The documents indicate a pre-engineered metal building for the primary structure. Insulated metal overhead doors and personnel doors will provide access. Windows are shown as double-hung aluminum units.

b. 8,800 SF garage footprint with 8 vehicle storage garage bays.

a. Site/Civil Scope includes all site work as shown on the plans including:
   1) Approximately 39,500 sf paved parking and facility operation areas at the Crosby Maintenance Yard.
   2) Domestic service to new garage connecting to existing 2" water main.
   3) Exterior H-20 oil/water separator.
   4) Exterior generator pad with connection to new garage.
   5) New exterior propane tanks (4) with connections to the proposed generator, and the proposed 8-bay vehicle storage garage.
   6) Remove and reset existing exterior propane tanks (2) and re-establish a connection to the existing 8-bay maintenance garage.
   7) Stone berm level lip spreader at the southeast corner of the proposed garage to address channelized drainage concerns.
   8) Establish overhead/underground power to the proposed 8-bay vehicle storage garage.

b. The pre-engineered metal building structure is clad with draped insulation for walls and roof, with standard metal wall and roof panel assemblies. The exterior overhead and pass doors will be R-15 minimum. The exterior windows will be R-2.2 minimum.

Plans

The drawings included in these Contract Documents, and referred to as the Plans, show the general character of the work to be done under this Contract. They bear the general title **"Maine Turnpike – Contract 2021.06 – New Crosby Vehicle Storage Garage"**. The right is reserved by the Resident to make such minor corrections or alterations in the Plans as he deems necessary without change in the unit prices on the Schedule of Prices of the Proposal.

101.2 Definition

Holidays

The following is added after Memorial Day in the Supplemental Specifications:

Independence Day 2022	12:01 p.m.(Noon) preceding Friday to (Fourth of July) 6:00 a.m. the following Tuesday.

103.4 Notice of Award

The following sentence is added:

The Maine Turnpike Authority Board is scheduled to consider the Contract Award on December 16, 2021.

104.3.8 Wage Rates and Labor Laws

Section 104.3.8 Wage Rates and Labor Laws has been amended as follows:

The fair minimum hourly rates determined by the State of Maine Department of Labor for this Contract are as follows:

THIS DOCUMENT MUST BE CLEARLY POSTED AT ALL CONSTRUCTION SITES FUNDED IN PART WITH STATE FUNDS

State of Maine
Department of Labor
Bureau of Labor Standards
Augusta, Maine 04333-0045
Telephone (207) 623-7906

Wage Determination - In accordance with 26 MRS §1301 et. seq., this is a determination by the Bureau of Labor Standards, of the fair minimum wage rate to be paid to laborers and workers employed on the below titled project.

2021 Fair Minimum Wage Rates
Building 2 Cumberland County
(other than 1 or 2 family homes)

Occupation Title	Minimum Wage	Minimum Benefit	Total	Occupation Title	Minimum Wage	Minimum Benefit	Total
Asbestos/Lead Removal Worker	$ 17.75	$ 0.72	$ 18.47	Heating/Vent/AC	$ 28.50	$ 3.92	$ 32.42
Assembler - Metal Building	$ 18.75	$ 3.55	$ 22.30	Insulation Installer	$ 21.00	$ 3.05	$ 24.05
Backhoe Loader Operator	$ 29.83	$ 12.87	$ 42.70	Ironworker - Reinforcing	$ 19.50	$ 5.63	$ 25.13
Boom Truck (Truck Crane) Operator	$ 25.00	$ 5.86	$ 30.86	Ironworker - Structural	$ 26.00	$ 7.66	$ 33.66
Bricklayer	$ 29.00	$ 4.45	$ 33.45	Laborer - Skilled	$ 20.00	$ 4.33	$ 24.33
Bulldozer Operator	$ 22.00	$ 3.37	$ 25.37	Laborers (Helpers & Tenders)	$ 17.04	$ 1.15	$ 18.19
Carpenter	$ 25.41	$ 4.81	$ 30.22	Line Erector - Power/Cable Splicer	$ 32.89	$ 6.55	$ 39.44
Carpenter - Acoustical	$ 20.00	$ 18.82	$ 38.82	Loader Operator - Front-End	$ 20.00	$ 2.97	$ 22.97
Carpenter - Rough	$ 22.90	$ 4.63	$ 27.53	Mechanic- Maintenance	$ 33.55	$ 2.75	$ 36.30
Cement Mason/Finisher	$ 19.50	$ 3.89	$ 23.39	Mechanic- Refrigeration	$ 26.71	$ 7.02	$ 33.73
Communication Equip Installer	$ 25.08	$ 5.73	$ 30.81	Millwright	$ 22.00	$ 1.96	$ 23.96
Concrete Pump Operator	$ 20.50	$ 0.00	$ 20.50	Oil/Fuel Burner Servicer/Installer	$ 25.20	$ 5.40	$ 30.60
Crane Operator =>15 Tons)	$ 29.00	$ 6.68	$ 35.86	Painter	$ 18.13	$ 1.89	$ 20.02
Crusher Plant Operator	$ 20.00	$ 2.90	$ 22.90	Pipe/Steam/Sprinkler Fitter	$ 26.00	$ 5.41	$ 31.41
Dry-Wall Applicator	$ 25.41	$ 1.49	$ 26.90	Plumber (Licensed)	$ 29.50	$ 4.24	$ 33.74
Dry-Wall Taper & Finisher	$ 29.50	$ 3.13	$ 32.63	Plumber Helper/Trainee	$ 19.44	$ 2.49	$ 21.93
Earth Auger Operator	$ 26.96	$ 5.55	$ 32.51	Propane & Natural Gas Serv/Inst	$ 28.00	$ 4.57	$ 32.57
Electrician - Licensed	$ 31.03	$ 16.28	$ 47.31	Roofer	$ 23.13	$ 0.00	$ 23.13
Electrician Helper/Cable Puller	$ 18.00	$ 2.01	$ 20.01	Sheet Metal Worker	$ 23.50	$ 5.30	$ 28.80
Elevator Constructor/Installer	$ 61.25	$ 39.21	$ 100.46	Sider	$ 17.50	$ 4.28	$ 21.78
Excavator Operator	$ 22.00	$ 1.85	$ 23.85	Tile Setter	$ 23.00	$ 3.58	$ 26.58
Fence Setter	$ 20.00	$ 6.61	$ 26.61	Truck Driver - Heavy	$ 18.00	$ 0.66	$ 18.66
Floor Layer	$ 23.00	$ 5.48	$ 28.48	Truck Driver - Light	$ 17.00	$ 0.52	$ 17.52
Furniture Installer/Assembler	$ 16.00	$ 2.52	$ 18.52	Truck Driver - Medium	$ 20.95	$ 2.02	$ 22.97
Glazier	$ 19.50	$ 4.71	$ 24.21	Truck Driver - Tractor Trailer	$ 20.00	$ 0.72	$ 20.72

The Laborer classifications include a wide range of work duties. Therefore, if any specific occupation to be employed on this project is not listed in this determination, call the Bureau of Labor Standards at the above number for further clarification.

Welders are classified in the trade to which the welding is incidental.

Apprentices – The minimum wage rate for registered apprentices are those set forth in the standards and policies of the Maine State Apprenticeship and Training Council for approved apprenticeship programs.

Title 26 §1310 requires that a clearly legible statement of all fair minimum wage and benefits rates to be paid the several classes of laborers, workers and mechanics employed on the construction on the public work must be kept posted in a prominent and easily accessible place at the site by each contractor and subcontractor subject to sections 1304 to 1313.

Appeal – Any person affected by the determination of these rates may appeal to the Commissioner of Labor by filing a written notice with the Commissioner stating the specific grounds of the objection within ten (10) days from the filing of these rates.

A true copy

Attest: Scott R. Cotnoir

Scott R. Cotnoir
Wage & Hour Director
Bureau of Labor Standards

Expiration Date: 12-31-2021
Revised 2-25-2021

104.4.6 Utility Coordination

This Subsection is amended by the addition of the following:

These Special Provisions outline the arrangements which have been established by the Authority for coordination of the work to be accomplished by the utilities. The scope and schedule of utility relocation work is noted herein. The Contractor shall plan and conduct his work accordingly.

General

Utility working days are Monday through Friday, conditions permitting. Times are estimated on the basis of a single crew for each utility. Any times and dates mentioned are estimates only and are dependent upon favorable weather, working conditions, and freedom from emergencies. The Contractor shall have no claim against the Authority if they are exceeded.

The Contractor shall plan and conduct his operations in accordance with the following utility schedule. The Contractor must comply with all OSHA regulations pertaining to work adjacent to utility wires. The Contractor shall plan and conduct his work accordingly.

The following utilities are located within the Project limits. The Contractor shall ascertain the location of the existing utilities and any other necessary information by direct inquiry at the office of the following utility owners:

AERIAL AND UNDERGROUND UTILITIES

ELECTRIC:
Central Maine Power Company
83 Edison Drive
Augusta, ME 04336
(207) 626-9443
ATTN: Tim Robbins

WATER: N/A

CENTRAL MAINE POWER (CMP)

CMP will be setting new pole, service, and transformer for the proposed Crosby Vehicle Storage Garage. The contractor shall be responsible for the conduit and junction boxes from the new pole underground into the to the New Vehicle Storage Garage.

The contractor shall notify CMP ten (10) working days prior to the utility coordination meeting. The coordination effort is to relay contractor's construction schedule, determine possible covering of aerial conductors and schedule of the new service.

104.4.6.1 Temporary Utilities

The Contractor will be required to maintain access and all services/utilities to the existing 8-bay maintenance garage and other existing MTA facilities throughout construction. Existing services and utilities include, but are not necessarily limited to, power, telephone, water, sewer, propane, heat, and site/roadway lighting.

The Contractor shall be responsible for all temporary connections, service runs, relocations, disconnections, reconnections, temporary holding tanks, coordination with the MTA's propane supplier, coordination with the MTA's maintenance supervisors, etc. required to maintain these services for the duration of the project or until the permanent facilities are reconnected and properly working. This includes any required temporary services for the new 8-bay maintenance garage, the existing 8-bay maintenance garage, and any other MTA or State Police Facility within the vicinity of the project. Temporary propane services/holding tanks shall be protected by jersey barriers during construction. Temporary power can be provided on wooden poles located outside the clear zone or protected. The contractor shall coordinate with the Resident and MTA on temporary service locations as to not interfere with MTA maintenance activities during construction.

The Contractor should be made aware that the existing electrical line and water line that are shown running parallel (Northside) to the new 8-bay maintenance garage feed the Maine State Police building that is West of the site. Any work that impacts either of these lines in any way should be coordinated with the Maine State Police at least 48 hours in advance of the work.

Prior to start of construction, the Contractor shall submit a plan and schedule for maintaining existing services and utilities. No work on the project shall commence until this plan is approved by the MTA and/or the Resident. The plan shall identify all proposed temporary connections, service runs, relocations, disconnections, reconnections, etc. and shall reflect construction phasing and the Contractor's proposed sequence of work. Maintaining existing services and utilities and all temporary utility work, including proposed temporary connections, service runs, relocations, disconnections, reconnections, temporary tanks, coordination efforts, etc. shall be incidental to Contract 2021.06.

107.1 Contract Time and Contract Completion Date

All work for Contract 2021.06 shall be completed within 180 days of starting the work or by the following dates, whichever comes first:

- Substantial Completion: ~~December 23, 2022~~ **August 18, 2023**
- Final Completion: ~~January 13, 2023~~ **September 8, 2023**

The MTA will entertain a start date for this work that fits within the contractor's schedule beginning after a successful MTA Board Approval on ~~December 16, 2021~~ **January 20, 2022** and completed on or before the dates noted above. Liquidated damages will occur for each day after the above noted dates.

107.1.1 Substantial Completion

This subsection is amended by the addition of the following:

Substantial completion is defined as having completed the following work:

1. Substantially completed construction of the New Vehicle Storage Garage, including construction of all building foundation, framing and insulation, roofing, siding, doors, and commissioning of all building electrical, mechanical, heating, and plumbing.
2. Completion of Interior finish carpentry and painting.
3. Base pavement and surface pavement have been placed to lines and grades shown on plans.
4. Propane Tanks, Generator, and Oil Water Separator system operational.

Supplemental Liquidated damages on a calendar day basis in accordance with Supplemental Specifications Subsection 107.8 shall be assessed for each calendar day that substantial completion is not achieved. The Contractor will be responsible for paying the per diem costs listed in the Supplemental Specifications

Subsection 107.7.2 Schedule of Liquidated Damages for each day that substantial completion is not achieved by the specified date.

107.1.2 Limitations of Operations

Construction of the New Vehicle Storage Garage shall not interfere with Highway and Equipment Maintenance operations at any time.

The Contractor shall submit his proposed staging and storage areas for approval by the Resident. All stored equipment must be located to not interfere with Highway and Equipment maintenance operations.

SPECIAL PROVISION

ALL SECTIONS

GENERAL INFORMATION

All sections of the Maine DOT Standard Specifications and the Maine Turnpike Authority 2016 Supplemental Specification, not modified by other Special Provisions within this contract, shall apply with the following additions and modifications:

All Sections - Method of Measurement

These paragraphs shall be deleted in their entirety.

All Sections - Basis of Payment

These paragraphs shall be deleted in their entirety and replaced with the following:

All work completed under this this section, shall be paid for as part of the lump sum bid for the project.

SPECIAL PROVISION

SECTION 203

EXCAVATION AND EMBANKMENT

The provisions of Section 203 of the Maine DOT Standard Specifications and the Maine Turnpike Authority 2016 Supplemental Specification shall apply with the following additions and modifications:

203.01 Description

The following paragraph is added:

The work shall consist of cutting, removing, and disposing of the existing bituminous concrete pavement as shown on the Plans, or as approved by the owner/resident.

Common excavation shall include all excavation (over excavation) within the project limits. This shall include the complete removal and disposal of all material unsuitable for re-use on the project, existing pavement, topsoil, organics, foundations, utilities, relic materials, and structures that are located under the proposed building footprint as defined in the Geotechnical Report completed by S.W. Cole on May 29, 2020, and as noted on the Typical Sections.

During excavation if suitable material is encountered, it may be left in place or re-used on other portions of the project with approval from the resident.

Fill to raise grades, in landscaped and/or seeded areas should be non-organic compactable earth meeting the requirements of the Maine DOT Standard Specification (November 2014) 703.18 Common Borrow.

Fill to raise grades, in paved areas and in areas of backfill for over excavations, should be sand meeting the requirements of the Maine DOT Standard Specification (November 2014) 703.19 Granular Borrow for underwater backfill.

Crushed Stone as noted on the plans, used for underdrain aggregate shall be washed ¾ inch crushed stone meeting the requirements of Maine DOT Standard Specifications (November 2014) 703.22 Underdrain Backfill Material Type C.

The removal of the existing buried concrete beam that is located near the existing propane tanks shall be completed under this section.

203.04 General

The following sentence is added to the end of the third paragraph.

There are no approved waste storage areas or waste areas within the Project limits unless shown on the Plans. Unsuitable materials shall be disposed of off-site in accordance with Subsection 203.06.

All excavations shall be accomplished in accordance with the applicable OSHA Standards. The Resident reserves the right to request the Contractor to prepare an excavation plan. This plan shall include, but not necessarily be limited to, the limit and depth of excavation, side slope, shoring, trench box and utility support.

The on-site soils may be suitable for reuse as common borrow in landscaped and/or seeded areas, provided they are at a compactable moisture content at the time of reuse. Portions of the existing sandy soils may be suitable for reuse as granular borrow, provided they are free of organics and deleterious material, and are at a compactable

moisture content at the time of reuse. S.W. Cole recommends additional test pits be performed to assess suitability for reuse of existing material. Test pits to determine the suitability of existing materials will be considered incidental to the project. Relic buried organic materials are unsuitable for reuse.

The MTA has an existing stockpile (approximately 1,000 CY) of material classified as granular borrow (by the MTA). The Contractor shall utilize the existing stockpiled material on the site prior to ordering additional material. The Contractor will be responsible for confirming the quantity of the stockpiled material prior to bidding. No additional payment will be issued for any discrepancy between the estimated quantity and the contractors quantity. No additional payment will be issued for surveying, loading, or hauling the material from the stockpile to the site. The contractor shall provide their own equipment and personnel to haul and load the material.

203.10 Embankment Construction - General

The thirteenth and fourteenth paragraphs are deleted and replaced with the following:

All portions of the embankment shall be compacted in accordance with the designated embankment compaction requirements specified for the Project.

General Benching Requirements for proposed fills (common borrow, granular borrow, structural fill): The existing slopes should be benched prior to placing additional fill of any kind. Embankment fill of any kind, should be placed in lifts which extend laterally beyond the limits of the design side slopes such that the specified degree of compaction is achieved within the limits of the completed embankment. The slopes should then be trimmed back to design dimensions.

General Compaction Requirements for proposed fills (common borrow, granular borrow, structural fill): Fill of any kind should be placed in horizontal lifts and compacted such that the desired density is achieved throughout the lift thickness with 3 to 5 passes of the compaction equipment. Loose lift thicknesses for grading, fill and backfill activities should not exceed 12 inches. S.W. Cole recommends that fill and backfill be compacted to at least 95% of its maximum dry density as determined by ASTM D-1557. Crushed Stone should be compacted with 3 to 5 passes of a vibratory plate compactor having a static weight of at least 500 pounds.

203.16 Winter Construction of Embankments

The word “core” is deleted from the first and second sentences in the first paragraph.

203.18 Method of Measurement

These paragraphs shall be deleted in their entirety.

203.19 Basis of Payment

These paragraphs shall be deleted in their entirety and replaced with the following:

All work under Section 203, Excavation and Embankment, shall be paid for as part of the lump sum bid for the project.

There will be no additional payment for the required excavation plan.

SPECIAL PROVISION

SECTION 304

AGGREGATE BASE AND SUBBASE COURSES

The provisions of Section 304 of the Maine DOT Standard Specifications and the Maine Turnpike Authority 2016 Supplemental Specification shall apply with the following additions and modifications:

304.02 General

Sources of Aggregate and preliminary test results shall be submitted ten working days prior to any placement of material on the job. Failure of these preliminary tests will be grounds for rejection of material from that source. Aggregates will be tested on the job and shall meet these specifications as the material is incorporated into the work.

Back fill for foundations, slab base material and material below the footings and exterior entrance slabs and within the frost transition zone as shown in the typical sections should be clean, non-frost susceptible sand and gravel meeting the graduation requirements for structural fill.

Structural Fill	
Sieve Size	**Percent Finer by Weight**
4 inch	100
3 inch	90 to 100
¼ inch	25 to 90
No. 40	0 to 30
No. 200	0 to 6

304.06 Method of Measurement

These paragraphs shall be deleted in their entirety.

304.07 Basis of Payment

These paragraphs shall be deleted in their entirety and replaced with the following:

All work under Section 304, Aggregate Base and Subbase Course, shall be paid for as part of the lump sum bid for the project.

The costs for laboratory testing and source documentation shall be incidental to the project. The costs for all failing tests shall be the responsibility of the contractor.

No additional payment will be made for the temporary placement of gravels during construction.

SPECIAL PROVISION

SECTION 403

HOT MIX ASPHALT PAVEMENT

The provisions of Section 403 of the Maine DOT Standard Specifications and the Maine Turnpike Authority 2016 Supplemental Specification shall apply with the following additions and modifications:

Project Pavement

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**	**403.210**	**1 ½"**	**1**	**C,I**

COMPLEMENTARY NOTES

A. The required PGAB for this mixture shall be **64E-28.**
B. RAP may not be used.
C. The MTA 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%.

403.04 Method of Measurement

These paragraphs shall be deleted in their entirety.

403.05 Basis of Payment

These paragraphs shall be deleted in their entirety and replaced with the following:

All work under Section 403, Hot Mix Asphalt Pavement, shall be paid for as part of the lump sum bid for the project.

SECTION 409

BITUMINOUS TACK COAT

The provisions of Section 409 of the Maine DOT Standard Specifications and the Maine Turnpike Authority 2016 Supplemental Specification shall apply with the following additions and modifications:

409.01 Description

This Subsection is deleted and replaced with the following:

This work consists of furnishing and applying one uniform application of RS-1 or RS-1h tack or an approved equal as indicated in this specification and as per manufacturers' recommendation. The application rate shall be 0.06 gal/yd2

A tack coat is required between pavement lifts as well as on all sawcut butt joints.

Delivery slips made out in duplicate by the Contractor and signed by the Resident should be kept as proof of tack used on this project. Delivery slips shall be furnished by the Contractor and shall provide space for identifying the vehicle and driver, for stating the volume of material carried, the source of the material, the date, and the Resident or his representative's signature.

409.05 Equipment

Add "or as determined by the Resident", after the words "gal/yd2]" in the fourth line of the second paragraph of this Subsection.

409.06 Preparation of Surface

The following paragraph is added:

All existing pavement and shoulder areas on which bituminous concrete mixtures are to be placed shall receive a tack coat. The surface area where the tack coat is to be applied shall be dry and cleaned of all dirt, sand, and loose material. Cleaning shall be accomplished by use of revolving brooms or mechanical sweepers. Undesirable material not removed by the above means shall be cleaned by hand sweeping or scraping, or a combination of both. Small areas otherwise inaccessible may be swept with hand brooms. The tack coat shall be applied only when the existing surface is dry.

409.08 Method of Measurement

These paragraphs shall be deleted in their entirety.

409.09 Basis of Payment

These paragraphs shall be deleted in their entirety and replaced with the following:

All work under Section 409, Bituminous Tack Coat, shall be paid for as part of the lump sum bid for the project.

SPECIAL PROVISION

SECTION 419

SAWING AND SEALING JOINTS IN BITUMINOUS PAVEMENT

(Sawing Bituminous Pavement)

419.01 Description

This work consists of sawing bituminous concrete pavement as shown on the Plans, as specified herein or as approved by the Resident.

419.02 General

The bituminous concrete pavement to be sawed shall be accurately marked before cutting. The marking shall be in accordance with the locations as shown on the Plans or as approved by the Resident. Cutting shall be with an approved power-driven saw with an abrasive blade.

Unless otherwise noted or directed, the sawcut shall be vertical, a minimum of 3/8 inch wide, and extend to the depth as shown on the Plans.

Residue or debris from the sawing operation shall be removed immediately and legally disposed of by the Contractor.

419.03 Method of Measurement

These paragraphs shall be deleted in their entirety.

419.04 Basis of Payment

These paragraphs shall be deleted in their entirety and replaced with the following:

All work under Section 419, Sawing and Sealing Joints in Bituminous Pavement, shall be paid for as part of the lump sum bid for the project.

SPECIAL PROVISION

SECTION 603

PIPE CULVERTS AND STORM DRAINS

(PVC Pipe)

The provisions of Section 603 of the Maine DOT Standard Specifications and the Maine Turnpike Authority 2016 Supplemental Specification shall apply with the following additions and modifications:

603.01 Description

The following paragraphs are added:

This work shall also consist of furnishing and installing various sizes of PVC pipe. No other pipe types within the Option III alternatives will be accepted.

603.02 Materials

All Polyvinylchloride pipe for storm water and drainage systems shall meet the requirements of Subsection 706.08.

603.11 Method of Measurement

These paragraphs shall be deleted in their entirety.

603.12 Basis of Payment

These paragraphs shall be deleted in their entirety and replaced with the following:

All work under Section 603, Pipe Culverts and Stormdrains, shall be paid for as part of the lump sum bid for the project.

SPECIAL PROVISION

SECTION 604

MANHOLES, INLETS AND CATCH BASINS

(6,000 Gallon Holding Tank and H-20 Oil/Water Separator)

The provisions of Section 604 of the Maine DOT Standard Specifications and the Maine Turnpike Authority 2016 Supplemental Specification shall apply with the following additions and modifications:

604.01 Description

This work shall consist of the construction and placement of various drainage structures.

The proposed holding tank shall contain a liquid capacity of 6,000 gallons by American Concrete or equivalent. Conform to the applicable requirements of ASTM C478. Concrete compressive strength shall be 5,000 psi at 28 days. Wire fabric for reinforcement shall conform to the requirements of ASTM A185 and steel reinforcement shall conform to the requirements of ASTM A615 with a minimum yield stress of 40,000 psi.

All joints shall be sealed with Tylox superseal rubber gasket or equivalent.

The contractor shall provide a licensed tank installer for the installation (of both the Oil/Water Separator and the 6,000 gallon Holding Tank) per Maine Department of Environmental Protection requirements.

If required, the Contractor is responsible for submitting all required paperwork to the Maine Turnpike Authority prior to filing with the Maine DEP.

Shop drawings for both the 6,000-gallon holding tank and the H-20 Oil/Water Separator shall be completed, submitted to, and accepted by the Resident or the MTA prior to any work being completed relative to this section.

604.011 Oil/Water Separator Description:
The Contractor shall submit a shop drawing to the resident for approval for the H-20 Oil/Water Separator which shall meet the requirements listed herein:

- The Oil/Water separator shall perform its intended function and have pipe inlets/outlets within reasonable conformity with the special grading detail shown in the contract documents.
- Provide 30” diameter frame and cover on top of the structure with shiplap joints.
- Concrete: 5,000 PSI @ 28 days.
- Cement shall be type III per ASTM C150-81
- Reinforcing: Grade 60 Per ASTM A615.
- Design Loading: H-20 per ASTM C-478.
- Joints to be sealed watertight with Con-seal.
- Provide inlet/outlet pipe boots to fit 6” PVC pipe.
- Sealant inside or outside of the structure for waterproofing the concrete other than joints.

Example Oil/Water Separator that meets the requirements listed above:

- The George R. Roberts H-20 Oil/Water Separator.

604.02 Materials

Frame and Cover for Manhole and Holding tank shall be Neenah R-1156A or equivalent.

The frame, cover, and risers shall all be 30” in diameter for the 6,000-gallon holding tank as well as the H-20

oil/water separator.

The 6,000-gallon holding tank and H-20 oil/water separator shall be designed in accordance with the drawings shown in the plans or shall be an approved equal.

604.05 Method of Measurement

These paragraphs shall be deleted in their entirety.

604.06 Basis of Payment

These paragraphs shall be deleted in their entirety and replaced with the following:

All work under Section 604, Manholes, Inlets, and Catch Basins, shall be paid for as part of the lump sum bid for the project.

SPECIAL PROVISION

SECTION 605

UNDERDRAINS

(4" Foundation Drains)

The provisions of Section 605 of the Maine DOT Standard Specifications and the Maine Turnpike Authority 2016 Supplemental Specification shall apply with the following additions and modifications:

605.01 Description

This work shall consist of the construction and placement of an underdrain system to be installed on the outside edge of perimeter footings as well as the drainpipe that outlets on the Southeast side slope of the building. The underdrain pipe should consist of 4-inch diameter, perforated SDR-35 foundation drainpipe bedded in Crushed Stone and wrapped in non-woven geotextile fabric. The underdrain pipe must have a positive gravity outlet protected from freezing, clogging and backflow. Surface grades should be sloped away from the building for positive surface water drainage. General underdrain details are illustrated on the "Foundation Detail Sketch" in the Explorations and Geotechnical Engineering Services Report completed by S.W. Cole Engineering.

605.02 Materials

The material used for all 4" Foundation Drains shall be perforated SDR-35.

605.06 Method of Measurement

These paragraphs shall be deleted in their entirety.

605.07 Basis of Payment

These paragraphs shall be deleted in their entirety and replaced with the following:

All work under Section 605, Underdrains, shall be paid for as part of the lump sum bid for the project.

SPECIAL PROVISION

SECTION 610

STONE FILL, RIPRAP, STONE BLANKET, AND STONE DITCH PROTECTION
(Level Lip Spreader)

The provisions of Section 610 of the Maine DOT Standard Specifications and the Maine Turnpike Authority 2016 Supplemental Specification shall apply with the following additions and modifications:

610.01 Description

Level Lip Spreader shall meet gradation and compaction requirements noted in the details of the plan set and shall be shaped according to details as well as the grading plan.

The contractor shall stake out the location and elevations of the Level Lip Spreader in the field. The resident must approve the staked location prior to the contractor beginning construction.

The contractor shall test to ensure that the Level Lip Spreader is working correctly and is free of defects, payment for testing and repairing the Level Lip Spreader is considered incidental to the project.

610.05 Method of Measurement

These paragraphs shall be deleted in their entirety.

610.06 Basis of Payment

These paragraphs shall be deleted in their entirety and replaced with the following:

All work under Section 610, Stone Fill, Riprap, Stone Blanket, and Stone Ditch Protection, shall be paid for as part of the lump sum bid for the project.

SPECIAL PROVISION

SECTION 633

UTILITY – PROPANE
(Propane System)

633.01 Description

New Propane Tanks

Work shall include the connection/hookup and installation of propane gas service from the propane tanks (noted on the plans) to the proposed 8-bay maintenance garage. This work will include excavating, hauling, disposing, backfilling, and compacting of all materials for the construction of the proposed utility trench in reasonably close conformity with the lines, grades, thickness, and details shown on the Plans. This work shall also include laying the pipe, installing all fittings and valves, testing the system, and connecting to the proposed maintenance garage. The contractor shall install a complete and functioning system as approved by the MTA propane supplier.

Remove and Re-install Existing Propane Tanks

This work shall include emptying the existing tanks, removing the existing propane tanks from their foundation, safely storing them on site during construction, installing and maintaining a temporary propane service, and reinstalling the tanks as shown on the plans. The reinstallation of the existing propane tanks shall include all excavating, hauling, disposing, backfilling, compacting, connections and piping required to make a complete and functioning system.

Once removed from their existing foundations, the tanks shall be safely stored onsite at a location determined as suitable by the Maine Turnpike Authority. The Contractor is responsible for inspecting the existing tanks for defects prior to re-installing them. All pipes shall be new and free of defect.

This work shall include the complete removal of the existing propane tank foundations, gas lines, and all miscellaneous items that are a part of the complete and working system.

Temporary Service

This work shall include installing and maintaining a temporary propane supply to the existing 8-bay maintenance garage while construction is ongoing or until the existing propane tanks are reinstalled and fully functioning as approved by the MTA's propane supplier. No additional payment shall be made for a temporary propane supply, all work associated with this work shall be made incidental to the contract.

The location and duration of the temporary propane supply shall be coordinated with the MTA prior to the start of construction.

General Information

Propane tanks, unless otherwise specified on the plans, shall be supplied by the Contractor and shall be new.

The contractor shall be responsible for the installation of all propane tanks and all propane lines.

The contractor shall coordinate this work with the MTA propane supplier. The MTA propane supplier shall inspect and accept the lines that have been installed prior to backfilling the trenches.

SPECIAL PROVISION

SPECIAL PROVISIONS

SECTION 800

Vehicle Storage Garage

800.1 Description

Division 800 specifies materials, procedures, and requirements for the construction of the Crosby Vehicle Storage Garage, complete with all appurtenances, including any and all associated utilities and services within the limits as shown on the Drawings.

The Contractor shall submit to the Resident for approval a cost breakdown of the major components of work for the Crosby Vehicle Storage Garage by standard specification Division lines items from 01 to 41. This breakdown will be used as a basis for monthly pay estimates.

A building walk-thru shall occur 30 days prior to anticipated completion of the Garage. Contractor shall allow the MTA access to the new garage to furnish and install necessary equipment. This shall be one week prior to the completion of the building.

The Contractor shall ensure and be responsible for the total and complete coordination of all work in the Crosby Vehicle Storage Garage. The Contractor shall generate coordination drawings for the Building. Coordination drawings shall:

1. Be computer generated.
2. Show a dimensionally accurate representation of all equipment that was approved by the shop drawing process.
3. Show architectural features, structural features, piping, conduit, ductwork and any other items that require coordination which shall be accurately sized.
4. Be submitted to and approved by the MTA prior to the purchasing of any approved equipment.

800.2 Work Included

The work consists of the following:

1. Construction of an approximate 8,800 square foot pre-engineered building consisting of eight (8) equipment Storage Garage bays.

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.
- Excavating, filling, and backfilling for building utilities, services, foundations.
- Construction of reinforced concrete footings, pier, foundation walls, and slabs-on-grade including exterior concrete aprons and entry foundation/slab systems.

- Construction of the Building proper, including all equipment and interior and exterior finishes.

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

- Coordinating with the utility to provide a transformer and connections.

- Furnishing and installing secondary power conduit and wiring from the nearby utility transformer to the building including trenching and backfilling, conduit, wire, supports, brackets, junction boxes, etc. required to provide all work.

- Perimeter foundation underdrain and complete outlet to daylight distribution and erosion control at discharge.

- Oil/Water Separator inclusive of excavation, fill, power/conduit, and piping associated system piping.

800.3 Method of Measurement

The Crosby Vehicle Storage Garage will be measured for payment by the lump sum, complete and accepted.

The horizontal pay limit shall be within 5 feet of the defined perimeter of the building, entries and concrete aprons. The vertical pay limit for this work shall be above the bottom of footing level or bottom of footing subbase, if required.

All work within this pay limit, including utilities, excavation, backfilling, etc., will be included in this pay item. Work outside of the horizontal pay limit shall be performed under other portions of the Contract documents with the exception of:

- All work associated with the installation of the utility transformer and secondary service line into the building.

The work described above which shall be included in the Building pay item.

800.4 Basis of Payment

Building construction will be paid for at the lump sum price bid which shall be full compensation for the cost of furnishing all materials, equipment, supplies, tools, incidentals, labor and supervision necessary to satisfactorily complete the work in all respects, to the satisfaction of the Resident.

Mobilization shall not be within the lump sum pay limit but will be paid for and meet the specifications of pay item 659.10.

Payment will be made under:

Pay Item		Pay Unit
800.01	Crosby Vehicle Storage Garage	Lump Sum

SPECIAL PROVISIONS

SECTION 800

Concrete Pads

(Concrete Generator and Precast Concrete Propane Tank Pads)

800.01 Description

The work shall consist of installing a concrete generator pad for the backup generator as detailed in the project plans and these specifications.

This work shall consist of installing a precast concrete propane tank pads for proposed propane tanks as detailed in the project and these specifications.

Shop drawings for both the Concrete Generator Pad and the Precast Concrete Propane Tank Pads shall be stamped by a professional engineer and submitted to the Resident and the MTA for review/approval. The contractor must have approved shop drawings prior to any work being completed relative to this section.

800.02 Materials

Concrete shall be Class “A” concrete (4000 PSI) and shall meet the requirements of Section 502.

Reinforcing steel shall meet the requirements of Section 503.

800.03 Method of Measurement

These paragraphs shall be deleted in their entirety.

800.04 Basis of Payment

These paragraphs shall be deleted in their entirety and replaced with the following:

All work under Section 800, Concrete Pads, shall be paid for as part of the lump sum bid for the project.

SPECIAL PROVISION

SECTION 822

WATER SERVICE SUPPLY LINE

822.01 Description

This work shall consist of installing water service supply lines in reasonably close conformity with the lines and grades shown on the plans or established. The installation shall include the assembly of all components and materials shown on the plans or as directed.

822.02 General

The work in this Section shall also include the following:

- Furnishing and installation of pipe, tubing, valves, curb stops, service boxes, fittings, insulation, and any required accessories for a complete water service supply.
- Pipe flushing and testing.

All material used in this section shall be in accordance with the Portland Water District standard specifications/details.

The Maine Turnpike Authority and Maine State Police Building (on the West side of the Crosby Yard) shall be notified two weeks prior to starting construction of any portion of the water service supply line.

822.03 Materials

Water Service Supply Lines

Water service supply lines shall be high density polyethylene plastic tubing and conform to AWWA standard C901-02 (PE 3608 Pressure Class 200), ASTM D3350, ASTM D2737 and be clearly marked. The product shall be rated for a minimum 200 working PSI and the standard dimension ratio (SDR) shall not exceed 9 for tubing size.

Tubing shall be approved for potable water service by the National Sanitation Foundation (NSF) and bear the NSF seal. Stainless steel inserts shall be used at all connections.

Necessary fittings, adaptors and reducers shall be furnished as required.

Curb Stops

Curb stops shall be ball valve type construction with compression type fittings on both ends. Curb stops shall open left (counter-clockwise) and shall conform to AWWA/ANSI C800, manufactured by Ford, Hayes, Mueller or an approved equivalent.

Curb stops shall be sized to receive the service tubing without the use of enlargement/ reduction fittings.

Fittings

All fittings shall be compression type, designed for use with high density polyethylene plastic tubing (CTS).

Bedding

Bedding material for water service supply lines shall be screened sand consisting of clean, inert, hard, durable grains of quartz or other hard, durable rock, free from loam, clay, surface coatings, frozen or deleterious materials and in conformance with the following gradation:

Sieve (ASTM D422)	Percent Passing by Weight
No. 4	100
No. 8	80 - 95
No. 16	55 - 85
No. 50	0 - 35
No. 200	0 – 5

Bedding material for water service supply lines shall be compacted to a minimum of 92% of the laboratory derived Maximum Density Values at optimum moisture content as determined by ASTM D1557, Method C.

822.04 Installation Service Pipe

Care shall be exercised in placing and laying of services to prevent kinks or sharp bends and to prevent contact with sharp stones or ledge which would damage to the pipe. At least 6 inches of sand shall be placed adjacent to, under, and above the pipe, and no stone larger than 2 inches shall be placed over the pipe until the depth of backfill above the pipe is in excess of 1 foot.

Separation from Structures

Whenever possible, water pipes shall maintain a minimum distance of three (3) feet from underground adjacent unheated structures, such as manholes, catch basins, retaining walls, bridge abutments, parking garages, etc.

When spacing described above is not possible, Contractor shall provide insulation for the water pipe for a minimum of three (3) feet beyond the limits of the adjacent structure.

Testing

Hydrostatic pressure and leakage test shall be conducted in accordance with AWWA Standard C600 Standards. Domestic water service lines without attached fire service supply shall meet the latest edition of AWWA C600 series leakage requirements for the type of pipe being installed. Testing shall be conducted by a certified independent water testing company.

Flushing the System

Before the pipe is placed into service and is accepted for payment, the Contractor shall flush the pipe at a minimum rate of 6 gallons per minute for 15 minutes or until the water is clean and free from discoloration and or debris whichever is longer. The contractor shall coordinate with the resident and MTA to ensure that they are on site during this process to ensure the water is clear of debris prior to accepting the work.

822.05 Method of Measurement

These paragraphs shall be deleted in their entirety.

822.06 Basis of Payment

These paragraphs shall be deleted in their entirety and replaced with the following:

All work under Section 822, Water Service Supply Line, shall be paid for as part of the lump sum bid for the project.

SPECIAL PROVISION

SECTION 832

SITE BOLLARDS

832.01 Description

This work shall consist of furnishing and installing Type A Steel Site Bollards with cast in place concrete base, 6" schedule 80 steel pipe filled with concrete, and plastic yellow sleeve in accordance with these specifications, and as shown on the Plans.

Shop drawings for the site bollards shall be completed, submitted to, and accepted by the Resident prior to any work being completed relative to this section.

832.02 Materials

Concrete shall be Class "A" concrete (3000 PSI) and shall meet the requirements of Section 502.

Yellow sleeves are available from the sources noted on the plans or an approved equal.

632.03 Method of Measurement

These paragraphs shall be deleted in their entirety.

632.04 Basis of Payment

These paragraphs shall be deleted in their entirety and replaced with the following:

All work under Section 632, Site Bollards, shall be paid for as part of the lump sum bid for the project.

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Project information.
2. Work covered by Contract Documents.
3. Work by Owner.
4. Specification and drawing conventions.

1.2 PROJECT INFORMATION

A. Project Identification: **CROSBY VEHICLE STORAGE GARAGE, SOUTH PORTLAND, ME**

1. Project Location: South Portland, ME

B. Owner: Maine Turnpike Authority

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of the Project is defined by the Contract Documents and consists of the following:

1. The project consists of:

<u>NEW VEHICLE STORAGE BUILDING</u>:

a. The building is anticipated to be a high-bay vehicle storage building. The main floor being a concrete slab-on-grade, and generally constructed of durable and appropriate materials.

b. The documents indicate a pre-engineered metal building for the primary structure. Insulated metal overhead doors and personnel doors will provide access. Windows are shown as double-hung aluminum units.

c. Finishes are shown to include:

1) Ceilings: Painted exposed structure - no ceilings in garage
2) Perimeter Knee Walls: Cold-form framed, insulated and covered with FRP panels over the exposed 4’ perimeter concrete walls.
3) Floors: Sealed concrete throughout the main floor level~~, except ceramic tile at the toilet and shower rooms.~~

d. 8,800 SF building footprint. The programmed spaces include the following:

1) 8 vehicle storage garage bays, with adequate space for all.

e. Site/Civil Scope includes all site work as shown on the plans including:

1) Approximately 41,000 sf paved parking and facility operation areas at the Crosby Maintenance Yard.
2) Domestic service to new building connecting to existing 2" water main.
3) Exterior H-20 oil/water separator.
4) Exterior generator pad with connection to new building.
5) Exterior propane tank with connection to proposed generator and new building.
6) Stone berm level lip spreader at the southeast corner of the proposed building to address channelized drainage concerns.

f. The pre-engineered metal building structure is clad with draped insulation for walls and roof, with standard metal wall and roof panel assemblies. The exterior overhead and pass doors will be R-15 minimum. The exterior windows will be R-2.2 minimum.

1.4 PROJECT SCHEDULE

A. The Contractor shall complete the work for each phase on or before dates scheduled below:

1. Coordinate all water and power conversions with the owner to maintain service to all occupied buildings for the duration of the project.
2. Building shall be substantially completed by: December 23, 2022
3. Building shall achieve Final completion by: January 13, 2023

1.5 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

C. Drawing Coordination: Requirements for materials and products identified on the Drawings are described in detail in the Specifications. One or more of the following are used on the Drawings to identify materials and products:

1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 083613 - SECTIONAL DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes electrically operated sectional doors.

B. Related Requirements:

1. Section 055000 "Metal Fabrications" for miscellaneous steel supports.

1.2 ACTION SUBMITTALS

A. Product Data: For each type and size of sectional door and accessory.

1. Include construction details, material descriptions, dimensions of individual components, profile door sections, and finishes.
2. Include rated capacities, operating characteristics, electrical characteristics, and furnished accessories.

B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.

1. Include plans, elevations, sections, and mounting details.
2. Include details of equipment assemblies. Indicate dimensions, required clearances, method of field assembly, components, and location and size of each field connection.
3. Include points of attachment and their corresponding static and dynamic loads imposed on structure.
4. Include diagrams for power, signal, and control wiring.

C. Samples for Initial Selection: For units with factory-applied finishes.

1. Include Samples of accessories involving color selection.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Sample Warranties: For special warranties.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For sectional doors to include in maintenance manuals.

B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation and maintenance of units required for this Project.

1.5 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of sectional doors 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 components or operators before reaching required number of operation cycles.
c. Faulty operation of hardware.
d. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use; rust through.
e. Delamination of exterior or interior facing materials.

2. Warranty Period: Five years from date of Substantial Completion.

B. Special Finish Warranty: Manufacturer agrees to repair or replace components that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS, GENERAL

A. Source Limitations: Obtain sectional doors from single source from single manufacturer.

1. Obtain operators and controls from sectional door manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. General Performance: Sectional doors shall comply with performance requirements specified without failure due to defective manufacture, fabrication, installation, or other defects in construction.

B. Structural Performance, Exterior Doors: Capable of withstanding the design wind loads.

1. Design Wind Load: Uniform pressure (velocity pressure) of 20 lbf/sq. ft., acting inward and outward.
2. Testing: According to ASTM E 330.
3. Deflection Limits: Design sectional doors to withstand design wind loads without evidencing permanent deformation or disengagement of door components.

a. Deflection of door sections in horizontal position (open) shall not exceed 1/120 of the door width.
b. Deflection of horizontal track assembly shall not exceed 1/240 of the door height.

4. Operability under Wind Load: Design overhead coiling doors to remain operable under uniform pressure (velocity pressure) of 20 lbf/sq. ft. wind load, acting inward and outward.

2.3 DOOR ASSEMBLY

A. Steel Sectional Door: Sectional door formed with hinged sections and fabricated according to DASMA 102 unless otherwise indicated.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. C.H.I. Overhead Doors, Inc.
b. Clopay Building Products.
c. Haas Door.
d. Overhead Door Corporation.
e. Raynor.
f. Rite-Hite Corporation.
g. Wayne-Dalton Corp.
h. Windsor Door.

B. Operation Cycles: Door components and operators capable of operating for not less than 100,000. One operation cycle is complete when a door is opened from the closed position to the fully open position and returned to the closed position.

C. Air Infiltration: Maximum rate of 0.4 cfm/sq. ft. at 15 and 25 mph when tested according to ASTM E 283.

D. Installed R-Value: 14.5 deg F x h x sq. ft./Btu.

E. Steel Sections: Zinc-coated (galvanized) steel sheet with G60 (Z180) zinc coating.

1. Section Thickness: 2 inches.
2. Exterior-Face, Steel Sheet Thickness: 27 gauge.

a. Surface: Manufacturer's standard.

3. Insulation: Board or Foamed in place.
4. Interior Facing Material: Zinc-coated (galvanized) steel sheet with a nominal coated thickness of manufacturer's recommended dimension to comply with performance requirements.

F. Track Configuration: High lift.

G. Weatherseals: Fitted to bottom and top and around entire perimeter of door. Provide combination bottom weatherseal and sensor edge.

H. Windows: Approximately 24 by 11 inches, with curved corners, and spaced apart the approximate distance as indicated on Drawings; in one row at height indicated on Drawings; installed with glazing of the following type:
1. Insulating Glass: Manufacturer's standard.

I. Roller-Tire Material: Manufacturer's standard.

J. Counterbalance Type: Torsion spring.

K. Manual Door Operator: Chain-hoist operator.

L. Electric Door Operator:

1. Usage Classification: Standard duty, up to 25 cycles per hour and up to 90 cycles per day.
2. Operator Type: Jackshaft, side mounted.
3. Safety: Listed according to UL 325 by a qualified testing agency for commercial or industrial use; moving parts of operator enclosed or guarded if exposed and mounted at 8 feet or lower.
4. Motor Exposure: Interior, clean, and dry.
5. Emergency Manual Operation: Chain type.

6. Control Station: Interior-side mounted.
7. Other Equipment: Audible and visual signals.

M. Door Finish:

1. Baked-Enamel or Powder-Coat Finish: White; semi-gloss finish.
2. Finish of Interior Facing Material: White; semi-gloss finish.

2.4 MATERIALS, GENERAL

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

2.5 STEEL DOOR SECTIONS

A. Exterior Section Faces and Frames: Zinc-coated (galvanized), cold-rolled, commercial steel (CS) sheet, complying with ASTM A 653/A 653M, with indicated zinc coating and thickness.

1. Fabricate section faces from single sheets to provide sections not more than 24 inches high and of indicated thickness. Roll horizontal meeting edges to a continuous, interlocking, keyed, rabbeted, shiplap, or tongue-in-groove weather-resistant seal, with a reinforcing flange return.
2. For insulated doors, provide sections with continuous thermal-break construction, separating the exterior and interior faces of door.

B. Section Ends and Intermediate Stiles: Enclose open ends of sections with channel end stiles formed from galvanized-steel sheet not less than 0.064-inch- nominal coated thickness and welded to door section. Provide intermediate stiles formed from not less than 0.064-inch- thick

galvanized-steel sheet, cut to door section profile, and welded in place. Space stiles not more than 48 inches apart.

C. Reinforce bottom section with a continuous channel or angle conforming to bottom-section profile.

D. Reinforce sections with continuous horizontal and diagonal reinforcement, as required to stiffen door and for wind loading. Provide galvanized-steel bars, struts, trusses, or strip steel, formed to depth and bolted or welded in place. Ensure that reinforcement does not obstruct vision lites.

E. Provide reinforcement for hardware attachment.

F. Board Thermal Insulation: Insulate interior of steel sections with door manufacturer's standard CFC-free polystyrene or polyurethane board insulation, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, according to ASTM E 84; or with glass-fiber-board insulation. Secure insulation to exterior face sheet. Enclose insulation completely within steel sections and the interior facing material, with no exposed insulation.

G. Foamed-in-Place Thermal Insulation: Insulate interior of steel sections with door manufacturer's standard CFC-free polyurethane insulation, foamed in place to completely fill interior of section and pressure bonded to face sheets to prevent delamination under wind load, and with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, according to ASTM E 84. Enclose insulation completely within steel sections and the interior facing material, with no exposed insulation.

H. Interior Facing Material: Zinc-coated (galvanized), cold-rolled, commercial steel (CS) sheet, complying with ASTM A 653/A 653M, with indicated thickness.

I. Fabricate sections so finished door assembly is rigid and aligned, with tight hairline joints and free of warp, twist, and deformation.

2.6 TRACKS, SUPPORTS, AND ACCESSORIES

A. Tracks: Manufacturer's standard, galvanized-steel track system of configuration indicated, sized for door size and weight, designed for lift type indicated and clearances indicated on Drawings, Provide complete system including brackets, bracing, and reinforcement to ensure rigid support of ball-bearing roller guides for required door type, size, weight, and loading.

1. Galvanized Steel: ASTM A 653/A 653M, minimum zinc coating.
2. Slope tracks at an angle from vertical or design tracks to ensure tight closure at jambs when door unit is closed.
3. Track Reinforcement and Supports: Galvanized-steel members to support track without sag, sway, and vibration during opening and closing of doors. Slot vertical sections of track spaced 2 inches apart for door-drop safety device.

    a. For Vertical Track: Continuous reinforcing angle attached to track and attached to wall with jamb brackets.
    b. For Horizontal Track: Continuous reinforcing angle from curve in track to end of track, attached to track and supported at points by laterally braced attachments to overhead structural members.

B. Weatherseals: Replaceable, adjustable, continuous, compressible weather-stripping gaskets of flexible vinyl, rubber, or neoprene fitted to bottom and top of sectional door unless otherwise indicated.

C. Windows: Manufacturer's standard window units of type, size, and in arrangement indicated. Set glazing in vinyl, rubber, or neoprene glazing channel for metal-framed doors and elastic glazing compound for wood doors, as required. Provide removable stops of same material as door-section frames.

2.7 HARDWARE

A. General: Heavy-duty, corrosion-resistant hardware, with hot-dip galvanized, stainless-steel, or other corrosion-resistant fasteners, to suit door type.

B. Hinges: Heavy-duty, galvanized-steel hinges of not less than 0.079-inch- nominal coated thickness at each end stile and at each intermediate stile, according to manufacturer's written recommendations for door size. Attach hinges to door sections through stiles and rails with bolts and lock nuts or lock washers and nuts. Use rivets or self-tapping fasteners where access to nuts is impossible.

C. Rollers: Heavy-duty rollers with steel ball-bearings in case-hardened steel races, mounted with varying projections to suit slope of track. Extend roller shaft through both hinges where double hinges are required. Provide 3-inch- diameter roller tires for 3-inch- wide track and 2-inch-diameter roller tires for 2-inch- wide track.

2.8 COUNTERBALANCE MECHANISM

A. Torsion Spring: Counterbalance mechanism consisting of adjustable-tension torsion springs fabricated from steel-spring wire complying with ASTM A 229/A 229M, mounted on torsion shaft made of steel tube or solid steel. Provide springs designed for number of operation cycles indicated.

B. Cable Drums and Shaft for Doors: Cast-aluminum or gray-iron casting cable drums mounted on torsion shaft and grooved to receive door-lifting cables as door is raised. Mount counterbalance mechanism with manufacturer's standard ball-bearing brackets at each end of torsion shaft. Provide one additional midpoint bracket for shafts up to 16 feet long and two additional brackets at one-third points to support shafts more than 16 feet long unless closer spacing is recommended by door manufacturer.

C. Cables: Galvanized-steel, multistrand, lifting cables with cable safety factor of at least 5 to 1.

D. Cable Safety Device: Include a spring-loaded steel or spring-loaded bronze cam mounted to bottom door roller assembly on each side and designed to automatically stop door if either lifting cable breaks.

E. Bracket: Provide anchor support bracket as required to connect stationary end of spring to the wall and to level the shaft and prevent sag.

F. Bumper: Provide spring bumper at each horizontal track to cushion door at end of opening operation.

2.9 MANUAL DOOR OPERATORS

A. General: Equip door with manual door operator by door manufacturer.

B. Chain-Hoist Operator: Consisting of endless steel hand chain, chain-pocket wheel and guard, and gear-reduction unit with a maximum 25-lbf force for door operation. Provide alloy-steel hand chain with chain holder secured to operator guide.

2.10 ELECTRIC DOOR OPERATORS

A. General: Electric door operator assembly of size and capacity recommended and provided by door manufacturer for door and "operation cycles" requirement specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, solenoid-operated brake, clutch, control stations, control devices, integral gearing for locking door, and accessories required for proper operation.

1. Comply with NFPA 70.
2. Control equipment complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6; with NFPA 70, Class 2 control circuit, maximum 24-V ac or dc.

B. Usage Classification: Electric operator and components capable of operating for not less than number of cycles per hour indicated for each door.

C. Door-Operator Type: Unit consisting of electric motor, gears, pulleys, belts, sprockets, chains, and controls needed to operate door and meet required usage classification.

1. Jackshaft, Side Mounted: Jackshaft operator mounted on the inside front wall on right or left side of door and connected to torsion shaft with an adjustable coupling or drive chain.
2. Provide center mounted jackshaft operator upon approval of Authority at oversized doors with insufficient clearance to structure for side-mounted jackshaft.

D. Motors: Reversible-type motor with controller (disconnect switch) for motor exposure indicated.

1. Electrical Characteristics:

   a. Phase: Single phase.
   b. Volts: 115 V.
   c. Hertz: 60.

2. Motor Size: Minimum size as indicated. If not indicated, large enough to start, accelerate, and operate door in either direction from any position, at a speed not less than 8 in./sec. and not more than 12 in./sec., without exceeding nameplate ratings or service factor.

3. Operating Controls, Controllers (Disconnect Switches), Wiring Devices, and Wiring: Manufacturer's standard unless otherwise indicated.
4. Coordinate wiring requirements and electrical characteristics of motors and other electrical devices with building electrical system and each location where installed.
5. Use adjustable motor-mounting bases for belt-driven operators.

E. Limit Switches: Equip motorized door with adjustable switches interlocked with motor controls and set to automatically stop door at fully opened and fully closed positions.

F. Obstruction Detection Device: External entrapment protection consisting of indicated automatic safety sensor capable of protecting full width of door opening. Activation of device immediately stops and reverses downward door travel.

G. Control Station: Three-button control station in fixed location with momentary-contact push-button controls labeled "Open" and "Stop" and sustained- or constant-pressure, push-button control labeled "Close."

1. Interior-Mounted Units: Full-guarded, surface-mounted, heavy-duty type, with general-purpose NEMA ICS 6, Type 1 enclosure.

H. Emergency Manual Operation: Equip electrically powered door with capability for emergency manual operation. Design manual mechanism so required force for door operation does not exceed 25 lbf.

I. Emergency Operation Disconnect Device: Equip operator with hand-operated disconnect mechanism for automatically engaging manual operator and releasing brake for emergency manual operation while disconnecting motor without affecting timing of limit switch. Mount mechanism so it is accessible from floor level. Include interlock device to automatically prevent motor from operating when emergency operator is engaged.

J. Motor Removal: Design operator so motor may be removed without disturbing limit-switch adjustment and without affecting emergency manual operation.

K. Audible and Visual Signals: Audible alarm and visual indicator lights in compliance with regulatory requirements for accessibility.

2.11 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM/NOMMA's "Metal Finishes Manual for Authorityural and Metal Products (AMP 500-06)" for recommendations for applying and designating finishes.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.12 STEEL AND GALVANIZED-STEEL FINISHES

A. Baked-Enamel or Powder-Coat Finish: Manufacturer's standard baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for cleaning, pretreatment, application, and minimum dry film thickness.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for substrate construction and other conditions affecting performance of the Work.

B. Examine locations of electrical connections.

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

3.2 INSTALLATION

A. Install sectional doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.

B. Tracks:

1. Fasten vertical track assembly to opening jambs and framing, spaced not more than 24 inches apart.
2. Hang horizontal track assembly from structural overhead framing with angles or channel hangers attached to framing by welding or bolting, or both. Provide sway bracing, diagonal bracing, and reinforcement as required for rigid installation of track and door-operating equipment.

C. Power-Operated Doors: Install according to UL 325.

3.3 STARTUP SERVICES

A. Engage a factory-authorized service representative to perform startup service.

1. Complete installation and startup checks according to manufacturer's written instructions.
2. Test and adjust controls and safety devices. Replace damaged and malfunctioning controls and equipment.

3.4 ADJUSTING

A. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion.

B. Lubricate bearings and sliding parts as recommended by manufacturer.

C. Adjust doors and seals to provide weather-resistant fit around entire perimeter.

D. Touch-up Painting: Immediately after welding galvanized materials, clean welds and abraded galvanized surfaces and repair galvanizing to comply with ASTM A 780/A 780M.

3.5 MAINTENANCE SERVICE

A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 12 months' full maintenance by skilled employees of coiling-door Installer. Include bi-annual preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.

1. Perform maintenance, including emergency callback service, during normal working hours.
2. Include 24-hour-per-day, seven-day-per-week, emergency callback service.

3.6 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain sectional doors.

END OF SECTION 083613

SECTION 133419 - METAL BUILDING SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Structural-steel framing.
2. Metal roof panels.
3. Metal wall panels.
4. Thermal Insulation
5. Accessories.

B. Related Requirements:

1. 077253 - Snow Guards
2. 081113 - Hollow Metal Doors and Frames
3. 083613 - Sectional Doors
4. 085313 - Vinyl Windows

1.2 DEFINITIONS

A. Terminology Standard: See MBMA's "Metal Building Systems Manual" for definitions of terms for metal building system construction not otherwise defined in this Section or in standards referenced by this Section.

1.3 COORDINATION

A. Coordinate sizes and locations of concrete foundations and casting of anchor-rod inserts into foundation walls and footings. Anchor rod installation, concrete, reinforcement, and formwork requirements are specified in Section 033000 "Cast-in-Place Concrete."

B. Coordinate metal panel assemblies with rain drainage work, flashing, trim, and construction of supports and other adjoining work to provide a leak proof, secure, and noncorrosive installation.

1.4 SUBMITTALS

A. Product Data: For each type of metal building system component.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:

a. Metal Roof Panels
b. Metal Wall Panels

c. Metal soffit panels.
d. Thermal insulation and vapor-retarder facings.
e. Structural-steel framing system
f. Accessories.

B. Shop Drawings: Indicate components by others. Include full building plan, elevations, sections, details and the following:

1. Anchor-Rod Plans: Submit anchor-rod plans and templates before foundation work begins. Include location, diameter, and minimum required projection of anchor rods required to attach metal building to foundation. Indicate column reactions at each location.

2. Structural-Framing Drawings: Show complete fabrication of primary and secondary framing; include provisions for openings. Indicate welds and bolted connections, distinguishing between shop and field applications. Include transverse cross-sections.

3. Metal Wall Panel Layout Drawings: Show layouts of panels including methods of support. Include details of edge conditions, joints, panel profiles, corners, anchorages, clip spacing, trim, flashings, closures, and special details. Distinguish between factory- and field-assembled work; show locations of exposed fasteners.

a. Show wall-mounted items including personnel doors, vehicular doors, windows, louvers, and lighting fixtures.

4. Accessory Drawings: Include details of the following items, at a scale of not less than 1-1/2 inches per 12 inches

a. Flashing and trim.

C. Samples for Initial Selection: For units with factory-applied finishes.

D. Samples for Verification: For the following products:

1. Panels: Nominal 12 inches long by actual panel width. Include fasteners, closures, and other exposed panel accessories.
2. Flashing and Trim: Nominal 12 inches long. Include fasteners and other exposed accessories.
3. Vapor-Retarder Facings: Nominal 6-inch-square Samples.
4. Windows: Full-size, nominal 12-inch-long frame Samples showing typical profile.
5. Accessories: Nominal 12-inch-long Samples for each type of accessory.

E. Delegated-Design Submittal: For metal building systems.

1. Include analysis data indicating compliance with performance requirements and design data signed and sealed by the qualified professional engineer responsible for their preparation.

F. Qualification Data: For erector, manufacturer, professional engineer, and testing agency.

G. Welding certificates.

H. Letter of Design Certification: Signed and sealed by a qualified professional engineer. Include the following:

1. Name and location of Project.
2. Order number.
3. Name of manufacturer.
4. Name of Contractor.
5. Building dimensions including width, length, height, and roof slope.
6. Indicate compliance with AISC standards for hot-rolled steel and AISI standards for cold-rolled steel, including edition dates of each standard.
7. Governing building code and year of edition.
8. Design Loads: Include dead load, roof live load, collateral loads, roof snow load, deflection, wind loads/speeds and exposure, seismic design category or effective peak velocity-related acceleration/peak acceleration, and auxiliary loads (cranes).
9. Load Combinations: Indicate that loads were applied acting simultaneously with concentrated loads, according to governing building code.
10. Building-Use Category: Indicate category of building use and its effect on load importance factors. (**This Building shall be designed as a Category IV – Essential building**)

I. Erector Certificates: For qualified erector, from manufacturer.

J. Material Test Reports: For each of the following products:

1. Structural steel including chemical and physical properties.
2. Bolts, nuts, and washers including mechanical properties and chemical analysis.
3. Tension-control, high-strength, bolt-nut-washer assemblies.
4. Shop primers.
5. Non-shrink grout.

K. Source quality-control reports.

L. Field quality-control reports.

M. Sample Warranties: For special warranties.

N. Maintenance Data: For metal panel finishes to be include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer.

1. Accreditation: Manufacturer's facility accredited according to the International Accreditation Service's AC472, "Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems."
2. Engineering Responsibility: Preparation of comprehensive engineering analysis and Shop Drawings by a professional engineer who is legally qualified to practice in jurisdiction where Project is located.

B. Erector Qualifications: An experienced erector who specializes in erecting and installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer.

C. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.3, "Structural Welding Code - Sheet Steel."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, sheets, panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

1.7 FIELD CONDITIONS

A. Weather Limitations: Proceed with panel installation only when weather conditions permit metal panels to be installed according to manufacturers' written instructions and warranty requirements.

1.8 WARRANTY

A. Special Warranty on Metal Panel Finishes: Manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. Butler Manufacturing Company; a division of BlueScope Buildings North America, Inc.
2. Ceco Building Systems; an NCI company.

3. MESCO BUILDING SOLUTIONS; Irving, TX 75061Nucor Building Systems.
4. Varco-Pruden Buildings; A division of BlueScope Buildings North America, Inc.

B. Source Limitations: Obtain metal building system components, including primary and secondary framing and metal panel assemblies, from single source from single manufacturer.

2.2 SYSTEM DESCRIPTION

A. Provide a complete, integrated set of mutually dependent components and assemblies that form a metal building system capable of withstanding structural and other loads, thermally induced movement, and exposure to weather without failure or infiltration of water into building interior.

B. Primary-Frame Type:

1. Rigid Modular: Solid-member, structural-framing system with interior columns.

C. End-Wall Framing: Engineer end walls to be expandable. Provide primary frame, capable of supporting full-bay design loads, and end-wall columns.

D. Secondary-Frame Type: Manufacturer's standard purlins and joists and exterior-framed (bypass) girts.

E. Eave Height: Noted on Architectural Drawing sections.

F. Bay Spacing: As indicated on Drawings.

G. Roof Slope: As indicated on Drawings.

H. Roof System: Manufacturer's standard standing-seam, vertical-rib, metal roof panels.

1. Liner Panels: Tapered rib.

I. Exterior Wall System: Manufacturer's standard concealed-fastener, flush profile, metal wall panels.

1. Liner Panels: Flush profile.

2.3 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer to design metal building system.

1. Structural Performance: Metal building systems shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to procedures in MBMA's "Metal Building Systems Manual."

a. Design Loads: As indicated on Drawings.

b. Deflection and Drift Limits: Design metal building system assemblies to withstand serviceability design loads without exceeding deflections and drift limits recommended in AISC Steel Design Guide No. 3 "Serviceability Design

Considerations for Steel Buildings."

c. Deflection and Drift Limits: No greater than the following:

1. Purlins and Rafters: Vertical deflection of 1/240 of the span.
2. Girts: Horizontal deflection of 1/180 of the span.
3. Metal Roof Panels: Vertical deflection of 1/240 of the span.
4. Metal Wall Panels: Horizontal deflection of 1/180 of the span.
5. Design secondary-framing system to accommodate deflection of primary framing and construction tolerances, and to maintain clearances at openings.
6. Lateral Drift: Maximum of 1/200 of the building height.

B. Seismic Performance: Metal building system shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1. Seismic Design Parameters: As noted on Sheet S-000.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

D. Structural Performance for Metal Roof and Wall Panels: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 1592:

1. Wind Design Parameters: Per Wind Speed noted on Sheet S-001.

E. Air Infiltration for Metal Wall Panels: Comply with 2012 IECC performance requirements, and provide air leakage of not more than 0.06 cfm/sq. ft. when tested according to ASTM E 283 at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft..

F. Water Penetration for Metal Wall Panels: No water penetration when tested according to ASTM E 331 at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft..

G. Thermal Performance for Opaque Elements: Comply with 2009 IECC performance requirements, and provide air the following maximum U-factors and minimum R-values when tested according to ASTM C 1363 or ASTM C 518:

1. Roof:
   a. U-Factor: 0.049.
   b. R-Value: R-13 + R-19.

2. Walls:
   a. U-Factor: 0.069.
   b. R-Value: R-13 + R-5 CI.

2.4 STRUCTURAL-STEEL FRAMING

A. Structural Steel: Comply with AISC 360, "Specification for Structural Steel Buildings."

B. Bolted Connections: Comply with RCSC's "Specification for Structural Joints Using High-Strength Bolts."

C. Cold-Formed Steel: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" for design requirements and allowable stresses.

D. Primary Framing: Manufacturer's standard primary-framing system, designed to withstand required loads and specified requirements. Primary framing includes transverse and lean-to frames; rafters, rake, and canopy beams; sidewall, intermediate, end-wall, and corner columns; and wind bracing.

1. General: Provide frames with attachment plates, bearing plates, and splice members. Factory drill for field-bolted assembly. Provide frame span and spacing indicated.

a. Slight variations in span and spacing may be acceptable if necessary to comply with manufacturer's standard, as approved by Architect.

2. Rigid Modular Frames: I-shaped frame sections fabricated from shop-welded, built-up steel plates or structural-steel shapes. Provide interior columns fabricated from round steel pipes or tubes, or shop-welded, built-up steel plates.
3. Frame Configuration: Single gable.
4. Exterior Column: Tapered.
5. Rafter: Tapered.

E. End-Wall Framing: Manufacturer's standard primary end-wall framing fabricated for field-bolted assembly to comply with the following:

1. End-Wall and Corner Columns: I-shaped sections fabricated from structural-steel shapes; shop-welded, built-up steel plates; or C-shaped, cold-formed, structural-steel sheet.

2. End-Wall Rafters: C-shaped, cold-formed, structural-steel sheet; or I-shaped sections fabricated from shop-welded, built-up steel plates or structural-steel shapes.

F. Secondary Framing: Manufacturer's standard secondary framing, including purlins, girts, eave struts, flange bracing, base members, gable angles, clips, headers, jambs, and other miscellaneous structural members. Unless otherwise indicated, fabricate framing from either cold-formed, structural-steel sheet or roll-formed, metallic-coated steel sheet, prepainted with coil coating, to comply with the following:

1. Purlins: C- or Z-shaped sections; fabricated from built-up steel plates, steel sheet, or structural-steel shapes; minimum 2-1/2-inch-wide flanges.
   a. Depth: As needed to comply with system performance requirements.
2. Purlins (Optional): Steel joists per Specification Section 052100
3. Girts: C- or Z-shaped sections; fabricated from built-up steel plates, steel sheet, or structural-steel shapes. Form ends of Z-sections with stiffening lips angled 40 to 50 degrees from flange, with minimum 2-1/2-inch-wide flanges.

a. Depth: As required to comply with system performance requirements.

4. Eave Struts: Unequal-flange, C-shaped sections; fabricated from built-up steel plates, steel sheet, or structural-steel shapes; to provide adequate backup for metal panels.
5. Flange Bracing: Minimum 2-by-2-by-1/8-inch structural-steel angles or 1-inch-diameter, cold-formed structural tubing to stiffen primary-frame flanges.
6. Sag Bracing: Minimum 1-by-1-by-1/8-inch structural-steel angles.
7. Base or Sill Angles: Manufacturer's standard base angle, minimum 3-by-2-inch, fabricated from zinc-coated (galvanized) steel sheet.
8. Purlin and Girt Clips: Manufacturer's standard clips fabricated from steel sheet. Provide galvanized clips where clips are connected to galvanized framing members.
9. Framing for Openings: Channel shapes; fabricated from cold-formed, structural-steel sheet or structural-steel shapes. Frame head and jamb of door openings and head, jamb, and sill of other openings.
10. Miscellaneous Structural Members: Manufacturer's standard sections fabricated from cold-formed, structural-steel sheet; built-up steel plates; or zinc-coated (galvanized) steel sheet; designed to withstand required loads.

G. Bracing: Provide one of the following adjustable wind bracing:

1. Rods: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50; or ASTM A 529/A 529M, Grade 50; minimum 1/2-inch-diameter steel; threaded full length or threaded a minimum of 6 inches at each end.
2. Cable: ASTM A 475, minimum 1/4-inch-diameter, extra-high-strength grade, Class B, zinc-coated, seven-strand steel; with threaded end anchors.
3. Angles: Fabricated from structural-steel shapes to match primary framing, of size required to withstand design loads.
4. Rigid Portal Frames: Fabricated from shop-welded, built-up steel plates or structural-steel shapes to match primary framing; of size required to withstand design loads.
5. Fixed-Base Columns: Fabricated from shop-welded, built-up steel plates or structural-steel shapes to match primary framing; of size required to withstand design loads.
6. Diaphragm Action of Metal Panels: Design metal building to resist wind forces through diaphragm action of metal panels.

H. Anchor Rods: Headed anchor rods as indicated in Anchor Rod Plan for attachment of metal building to foundation.

I. Materials:

1. W-Shapes: ASTM A 992/A 992M; ASTM A 572/A 572M, Grade 50 or 55; or ASTM A 529/A 529M, Grade 50 or 55.
2. Channels, Angles, M-Shapes, and S-Shapes: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50 or 55; or ASTM A 529/A 529M, Grade 50 or 55.
3. Plate and Bar: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50 or 55; or ASTM A 529/A 529M, Grade 50 or 55.
4. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade B.
5. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade B or C, structural tubing.
6. Structural-Steel Sheet: Hot-rolled, ASTM A 1011/A 1011M, Structural Steel (SS), Grades 30 through 55, or High-Strength Low-Alloy Steel (HSLAS) or High-Strength Low-Alloy Steel with Improved Formability (HSLAS-F), Grades 45 through 70; or cold-rolled, ASTM A 1008/A 1008M, Structural Steel (SS), Grades 25 through 80, or HSLAS, Grades 45 through 70.

7. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, SS, Grades 33 through 80, or HSLAS or HSLAS-F, Grades 50 through 80; with G60 coating designation; mill phosphatized.
8. Metallic-Coated Steel Sheet Prepainted with Coil Coating: Steel sheet, metallic coated by the hot-dip process and pre-painted by the coil-coating process to comply with ASTM A 755/A 755M.

    a. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, SS, Grades 33 through 80, or HSLAS or HSLAS-F, Grades 50 through 80; with G90 coating designation.
    b. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, SS, Grade 50 or 80; with Class AZ50 coating.

9. Steel Joists: Manufactured according to "Standard Specifications for Open Web Steel Joists, K-Series," in SJI's "Standard Specifications and Load Tables for Steel Joists and Joist Girders"; with steel-angle, top- and bottom-chord members, and end- and top-chord arrangements as indicated on Drawings and required for secondary framing. See Section 052100.

10. Non-High-Strength Bolts, Nuts, and Washers: ASTM A 307, Grade A, carbon-steel, hex-head bolts; ASTM A 563 carbon-steel hex nuts; and ASTM F 844 plain (flat) steel washers.

    a. Finish: Mechanically deposited zinc coating, ASTM B 695, Class 50.

11. Structural Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy-hex steel structural bolts; ASTM A 563 heavy-hex carbon-steel nuts; and ASTM F 436 hardened carbon-steel washers.

    a. Finish: Mechanically deposited zinc coating, ASTM B 695, Class 50.

12. High-Strength Bolts, Nuts, and Washers: ASTM A 490, Type 1, heavy-hex steel structural bolts; ASTM A 563 heavy-hex carbon-steel nuts; and ASTM F 436 hardened carbon-steel washers, plain.
13. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, heavy-hex-head steel structural bolts with spline ends.

    a. Finish: Mechanically deposited zinc coating, ASTM B 695, Class 50, baked-epoxy coated.

14. Headed Anchor Rods: ASTM F 1554, Grade 36.

    a. Configuration: Straight.
    b. Nuts: ASTM A 563 heavy-hex carbon steel.
    c. Plate Washers: ASTM A 36/A 36M carbon steel.
    d. Washers: ASTM F 436 hardened carbon steel.
    e. Finish: Hot-dip zinc coating, ASTM F 2329, Class C.

15. Threaded Rods: ASTM A 36/A 36M.

    a. Nuts: ASTM A 563 heavy-hex carbon steel.
    b. Washers: ASTM F 436 hardened carbon steel.

c. Finish: Plain.

J. Finish: Factory primed. Apply specified primer immediately after cleaning and pretreating.

1. Clean and prepare in accordance with SSPC-SP2.
2. Coat with manufacturer's standard primer. Apply primer to primary and secondary framing to a minimum dry film thickness of 1 mil.

a. Prime secondary framing formed from uncoated steel sheet to a minimum dry film thickness of 0.5 mil on each side.

2.5 METAL ROOF PANELS

A. Standing Seam Interlocking Roof Panels

1. Standing-Seam, Vertical-Rib, Smooth Metal Roof Panels: Formed with vertical ribs at panel edges and intermediate stiffening ribs symmetrically spaced between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels and engaging opposite edge of adjacent panels.

a. Material: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 22 gage uncoated steel thickness. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

1. Exterior Finish: Three-coat fluoropolymer.
2. Color: As selected by Architect from manufacturer's full range.
3. Clips: Two-piece floating to accommodate thermal movement.
4. Joint Type: Mechanically seamed.
5. Panel Coverage: 18 inches minimum; 24 inches maximum.
6. Panel Height: 2 inches.

2.6 METAL WALL PANELS

A. Concealed-Fastener, Flush-Profile, Metal Wall Panels: Formed with vertical panel edges and flush surface; with flush joint between panels; with 1-inch- wide flange for attaching interior finish; designed to be installed by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners and factory-applied sealant in side laps.

1. Material: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 22 gage uncoated steel thickness. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

a. Exterior Finish: Three-coat Fluoropolymer.
b. Color: As selected by Architect from manufacturer's full range.

2. Panel Coverage: 12 inches minimum.

3. Panel Height: 1-1/2” – 1-3/4” nominal.

B. THE BASIS OF DESIGN product complying with Section 133419.2.1 Metal Building Systems Metal Wall Panels is as follows:

1. Manufacturer: MBCI; a division of NCI Group, Inc.
2. Model: FW-120-1
3. Gauge: 22
4. Width: 12 inch, minimum.
5. Thickness: 1-1/2 inch.
6. Profile: Flush; single bead.
7. Attachment: Concealed, with FW-120 Clip.
8. Finish: Smooth.
9. Color: Signature 300 Standard Color, Low Gloss; 17 colors available for Architect selection.
10. Available Manufacturers that may also have a complying product are listed below. Architect shall be the sole source for determining compliance with specified BASIS OF DESIGN.
    1. AEP Span
    2. Alcoa Architectural Products.
    3. Architectural Building Components.
    4. ATAS International, Inc.
    5. CENTRIA Architectural Systems.
    6. Fabral.
    7. Morin – A Kingspan Group Company.
    8. PAC-Clad; Petersen Aluminum Corporation.

2.7 THERMAL INSULATION

A. Faced Metal Building Insulation: ASTM C 991, Type II, glass-fiber-blanket insulation; 0.5-lb/cu. ft. density; 2-inch- wide, continuous, vapor-tight edge tabs; with a flame-spread index of 25 or less.

B. Retainer Strips: For securing insulation between supports, 0.025-inch (nominal-thickness, formed, metallic-coated steel or PVC retainer clips colored to match insulation facing.

C. Vapor-Retarder Facing: ASTM C 1136, with permeance not greater than 0.02 perm when tested according to ASTM E 96/E 96M, Desiccant Method.

1. Composition: White polypropylene film facing and fiberglass-polyester-blend fabric backing.

D. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

3.1 PERSONNEL DOORS AND FRAMES

A. Swinging Personnel Doors and Frames: As specified in Section 081113 "Hollow Metal Doors and Frames."

3.2 WINDOWS

A. Vinyl Windows: As specified in Section 085313 "Vinyl Windows."

B. Glazing: Comply with requirements specified in Section 088000 "Glazing."

3.3 ACCESSORIES

A. General: Provide accessories as standard with metal building system manufacturer and as specified. Fabricate and finish accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes. Comply with indicated profiles and with dimensional and structural requirements.

1. Form exposed sheet metal accessories that are without excessive oil-canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.

B. Wall Panel Accessories: Provide components required for a complete metal wall panel assembly including copings, fasciae, mullions, sills, corner units, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal wall panels unless otherwise indicated.

1. Closures: Provide closures at eaves and rakes, fabricated of same material as metal wall panels.
2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch-thick, flexible closure strips; cut or premolded to match metal wall panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

C. Flashing and Trim: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.018-inch nominal uncoated steel thickness, prepainted with coil coating; finished to match adjacent metal panels.

1. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers.
2. Opening Trim: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.030-inch nominal uncoated steel thickness, prepainted with coil coating. Trim head and jamb of door openings, and head, jamb, and sill of other openings.

D. Materials:

1. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide fasteners with heads matching color of materials being fastened by means of plastic caps or factory-applied coating.

a. Fasteners for Metal Panels: Manufacturer’s system for in the seam concealed fastening.
b. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws with hex washer head.
c. Blind Fasteners: High-strength aluminum or stainless-steel rivets.

2. Corrosion-Resistant Coating: Cold-applied asphalt mastic, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

3. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.
4. Metal Panel Sealants:

   a. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene-compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape of manufacturer's standard size.
   b. Joint Sealant: ASTM C 920; one part elastomeric polyurethane or polysulfide; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended by metal building system manufacturer.

3.4 FABRICATION

A. General: Design components and field connections required for erection to permit easy assembly.

1. Mark each piece and part of the assembly to correspond with previously prepared erection drawings, diagrams, and instruction manuals.
2. Fabricate structural framing to produce clean, smooth cuts and bends. Punch holes of proper size, shape, and location. Members shall be free of cracks, tears, and ruptures.

B. Tolerances: Comply with MBMA's "Metal Building Systems Manual" for fabrication and erection tolerances.

C. Primary Framing: Shop fabricate framing components to indicated size and section, with baseplates, bearing plates, stiffeners, and other items required for erection welded into place. Cut, form, punch, drill, and weld framing for bolted field assembly.

1. Make shop connections by welding or by using high-strength bolts.
2. Join flanges to webs of built-up members by a continuous, submerged arc-welding process.
3. Brace compression flange of primary framing with steel angles or cold-formed structural tubing between frame web and purlin web or girt web, so flange compressive strength is within allowable limits for any combination of loadings.
4. Weld clips to frames for attaching secondary framing if applicable, or punch for bolts.
5. Shop Priming: Prepare surfaces for shop priming according to SSPC-SP 2. Shop prime primary framing with specified primer after fabrication.

D. Secondary Framing: Shop fabricate framing components to indicated size and section by roll forming or break forming, with baseplates, bearing plates, stiffeners, and other plates required for erection welded into place. Cut, form, punch, drill, and weld secondary framing for bolted field connections to primary framing.

1. Make shop connections by welding or by using non-high-strength bolts.
2. Shop Priming: Prepare uncoated surfaces for shop priming according to SSPC-SP 2. Shop prime uncoated secondary framing with specified primer after fabrication.

E. Metal Panels: Fabricate and finish metal panels at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.

1. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of metal panel.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with erector present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Before erection proceeds, survey elevations and locations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments to receive structural framing, with erector present, for compliance with requirements and metal building system manufacturer's tolerances.

1. Engage land surveyor to perform surveying.

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

3.2 PREPARATION

A. Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition.

B. Provide temporary shores, guys, braces, and other supports during erection to keep structural framing secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural framing, connections, and bracing are in place unless otherwise indicated.

3.3 ERECTION OF STRUCTURAL FRAMING

A. Erect metal building system according to manufacturer's written instructions and drawings.

B. Do not field cut, drill, or alter structural members without written approval from metal building system manufacturer's professional engineer.

C. Set structural framing accurately in locations and to elevations indicated, according to AISC specifications referenced in this Section. Maintain structural stability of frame during erection.

D. Base and Bearing Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials and roughen surfaces prior to setting plates. Clean bottom surface of plates.

1. Set plates for structural members on wedges, shims, or setting nuts as required.
2. Tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.

3. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

E. Align and adjust structural framing before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with framing. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure.
2. Make allowances for difference between temperature at time of erection and mean temperature when structure will be completed and in service.

F. Primary Framing and End Walls: Erect framing level, plumb, rigid, secure, and true to line. Level baseplates to a true even plane with full bearing to supporting structures, set with double-nutted anchor bolts. Use grout to obtain uniform bearing and to maintain a level base-line elevation. Moist-cure grout for not less than seven days after placement.

1. Make field connections using high-strength bolts installed according to RCSC's "Specification for Structural Joints Using High-Strength Bolts" for bolt type and joint type specified.

a. Joint Type: Snug tightened or pretensioned as required by manufacturer.

G. Secondary Framing: Erect framing level, plumb, rigid, secure, and true to line. Field bolt secondary framing to clips attached to primary framing.

1. Provide rake or gable purlins with tight-fitting closure channels and fasciae.
2. Locate and space wall girts to suit openings such as doors and windows.
3. Provide supplemental framing at entire perimeter of openings, including doors, windows, louvers, ventilators, and other penetrations of roof and walls.

H. Bracing: Install bracing in roof and sidewall bays where indicated on erection drawings.

1. Tighten rod and cable bracing to avoid sag.
2. Locate interior end-bay bracing only where indicated.
3. Interior diagonal bracing between frames **IS NOT ALLOWED**. Portal frames shall be utilized as required for any required interior lateral bracing systems.

I. Framing for Openings: Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical and electrical work. Securely attach to structural framing.

J. Erection Tolerances: Maintain erection tolerances of structural framing within AISC 303.

3.4 METAL PANEL INSTALLATION, GENERAL

A. Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. Examination: Examine primary and secondary framing to verify that structural-panel support members and anchorages have been installed within alignment tolerances required by manufacturer.

1. Examine roughing-in for components and systems penetrating metal panels, to verify actual locations of penetrations relative to seams before metal panel installation.

C. General: Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Field cut metal panels as required for doors, windows, and other openings. Cut openings as small as possible, neatly to size required, and without damage to adjacent metal panel finishes.

a. Field cutting of metal panels by torch is not permitted unless approved in writing by manufacturer.

2. Install metal panels perpendicular to structural supports unless otherwise indicated.
3. Flash and seal metal panels with weather closures at perimeter of openings and similar elements. Fasten with self-tapping screws.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Locate metal panel splices over structural supports with end laps in alignment.
6. Lap metal flashing over metal panels to allow moisture to run over and off the material.

D. Lap-Seam Metal Panels: Install screw fasteners using power tools with controlled torque adjusted to compress seam tightly without damage to washers, screw threads, or metal panels. Install screws in predrilled holes.

1. Arrange and nest side-lap joints so prevailing winds blow over, not into, lapped joints. Lap ribbed or fluted sheets one full rib corrugation. Apply metal panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line.

E. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal roof panel manufacturer.

F. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal panel assemblies. Provide types of gaskets, fillers, and sealants indicated; or, if not indicated, provide types recommended by metal panel manufacturer.

1. Seal metal panel end laps with double beads of tape or sealant the full width of panel. Seal side joints where recommended by metal panel manufacturer.
2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

3.5 METAL WALL PANEL INSTALLATION

A. General: Install metal wall panels in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to girts, extending full height of building, unless otherwise indicated. Anchor metal wall panels and other components of the Work securely in place, with provisions

for thermal and structural movement.

1. Unless otherwise indicated, begin metal panel installation at corners with center of rib lined up with line of framing.
2. Shim or otherwise plumb substrates receiving metal wall panels.
3. When two rows of metal panels are required, lap panels 4 inches minimum.
4. When building height requires two rows of metal panels at gable ends, align lap of gable panels over metal wall panels at eave height.
5. Rigidly fasten base end of metal wall panels and allow eave end free movement for thermal expansion and contraction. Predrill panels.
6. Flash and seal metal wall panels with weather closures at eaves and rakes, and at perimeter of all openings. Fasten with self-tapping screws.
7. Install screw fasteners in predrilled holes.
8. Install flashing and trim as metal wall panel work proceeds.
9. Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete, and elsewhere as indicated on Drawings; if not indicated, as necessary for waterproofing.
10. Align bottom of metal wall panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws.
11. Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.

3.6 METAL ROOF PANEL INSTALLATION

A. General: Provide metal roof panels of full length from eave to ridge unless otherwise indicated or restricted by shipping limitations.

1. Install ridge caps as metal roof panel work proceeds.
2. Flash and seal metal roof panels with weather closures at eaves and rakes. Fasten with self-tapping screws.

B. Standing-Seam Metal Roof Panels: Fasten metal roof panels to supports with concealed clips at each standing-seam joint, at location and spacing and with fasteners recommended by manufacturer.

1. Install clips to supports with self-drilling or self-tapping fasteners.
2. Install pressure plates at locations indicated in manufacturer's written installation instructions.
3. Seamed Joint: Crimp standing seams with manufacturer-approved motorized seamer tool so that clip, metal roof panel, and factory-applied sealant are completely engaged.
4. Rigidly fasten eave end of metal roof panels and allow ridge end free movement for thermal expansion and contraction.
5. Provide metal closures at peaks, rake edges, rake walls, and each side of ridge caps.

C. Metal Fascia Panels: Align bottom of metal panels and fasten with self-drilling or self-tapping screws. Flash and seal metal panels with weather closures where fasciae meet soffits, along lower panel edges, and at perimeter of all openings.

D. Metal Roof Panel Installation Tolerances: Shim and align metal roof panels within installed tolerance of 1/4 inch in 20 feet on slope and location lines and within 1/8-inch (3- offset of adjoining faces and of alignment of matching profiles.

3.7 METAL WALL PANEL INSTALLATION

A. General: Install metal wall panels in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to girts, extending full height of building, unless otherwise indicated. Anchor metal wall panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Unless otherwise indicated, begin metal panel installation at corners with center of rib lined up with line of framing.
2. Shim or otherwise plumb substrates receiving metal wall panels.
3. When two rows of metal panels are required, lap panels 4 inches minimum.
4. When building height requires two rows of metal panels at gable ends, align lap of gable panels over metal wall panels at eave height.
5. Rigidly fasten base end of metal wall panels and allow eave end free movement for thermal expansion and contraction. Predrill panels.
6. Flash and seal metal wall panels with weather closures at eaves and rakes, and at perimeter of all openings. Fasten with self-tapping screws.
7. Install concealed screw fasteners in predrilled holes.
8. Install flashing and trim as metal wall panel work proceeds.
9. Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete, and elsewhere as indicated on Drawings; if not indicated, as necessary for waterproofing.
10. Align bottom of metal wall panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws.
11. Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.

B. Metal Wall Panels: Install metal wall panels on exterior side of girts. Attach metal wall panels to supports with concealed fasteners as recommended by manufacturer.

C. Installation Tolerances: Shim and align metal wall panels within installed tolerance of 1/4 inch in 20 feet, noncumulative; level, plumb, and on location lines; and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.8 ACCESSORY INSTALLATION

A. General: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components for a complete metal wall panel assembly, including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
2. Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by manufacturer.

B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Archirectural Sheet Metal Manual." Provide concealed fasteners where possible and set units true to line and level. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

1. Install exposed flashing and trim that is without excessive oil-canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space

movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

3.9 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform field quality control special inspections and to submit reports.

B. Product will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

3.10 ADJUSTING

A. Doors: After completing installation, test and adjust doors to operate easily, free of warp, twist, or distortion.

3.11 CLEANING AND PROTECTION

A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780/A 780M and manufacturer's written instructions.

B. Touchup Painting: After erection, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted structural framing, bearing plates, and accessories.

1. Clean and prepare surfaces by SSPC-SP 2, "Hand Tool Cleaning," or by SSPC-SP 3, "Power Tool Cleaning."
2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.

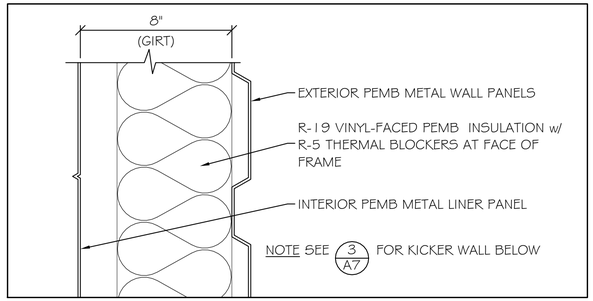
C. Metal Panels: Remove temporary protective coverings and strippable films, if any, as metal panels are installed. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

1. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

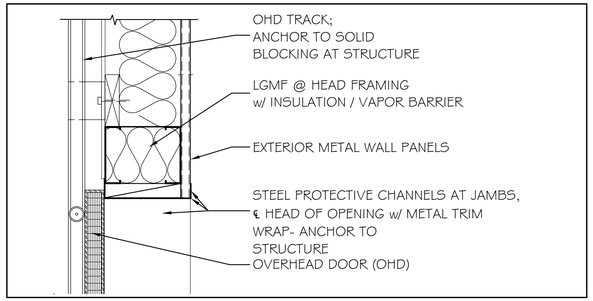
D. Doors and Frames: Immediately after installation, sand rusted or damaged areas of prime coat until smooth and apply touchup of compatible air-drying primer.

1. Immediately before final inspection, remove protective wrappings from doors and frames.

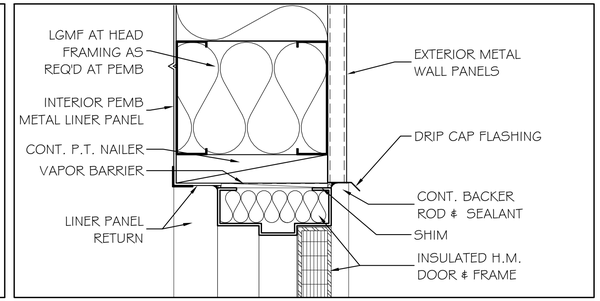
END OF SECTION 133419



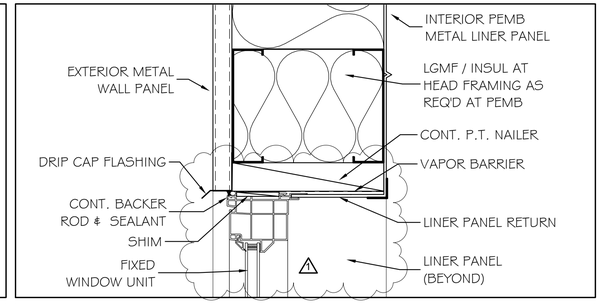
① PARTITION TYPE ◇1 — 3"= 1'-0"



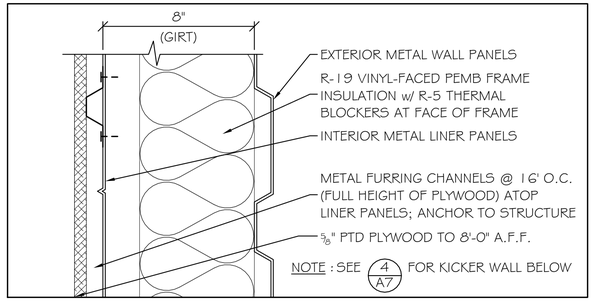
⑤ HEAD AT OVERHEAD SECTIONAL DOOR/EXT. METAL PANEL — 1½" = 1'-0"



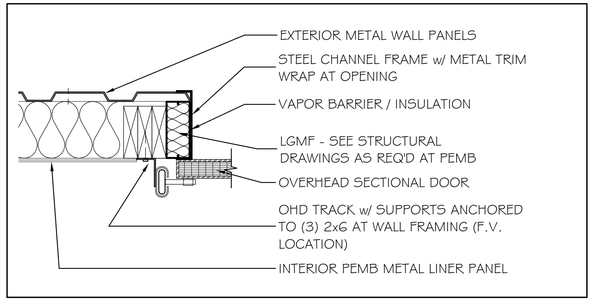
⑨ EXT. H.M. DOOR HEAD DETAIL — 3"= 1'-0"



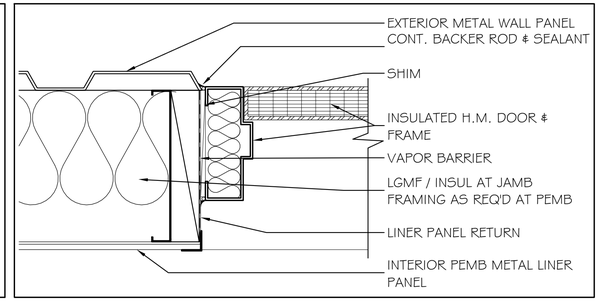
⑬ WINDOW HEAD DETAIL ⚠1 — 3"= 1'-0"



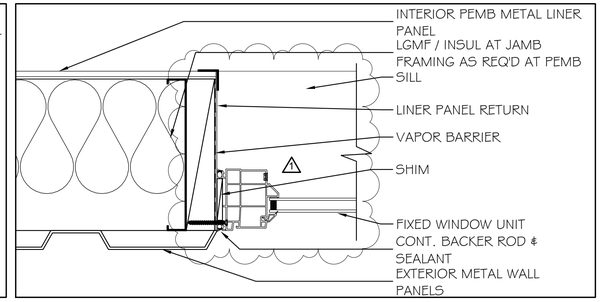
② PARTITION TYPE ◇2 — 3"= 1'-0"



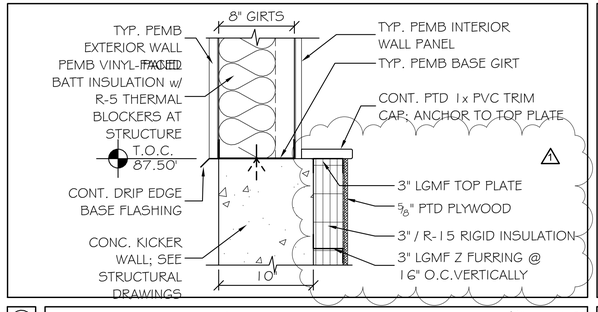
⑥ JAMB AT OVERHEAD SECTIONAL DOOR/EXT. METAL PANEL — 1½" = 1'-0"



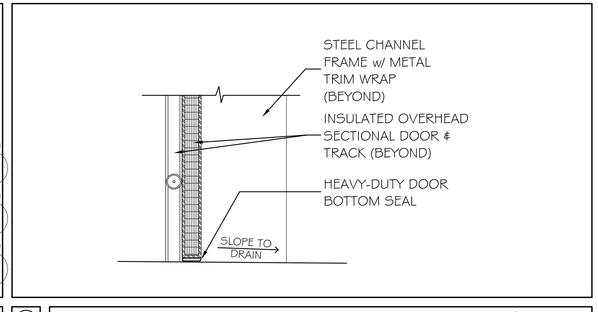
⑩ EXT. H.M. DOOR JAMB DETAIL — 3"= 1'-0"



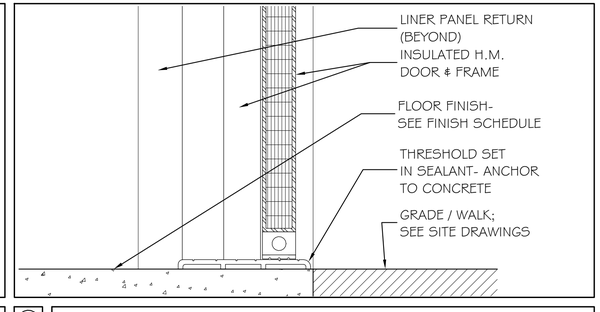
⑭ WINDOW JAMB DETAIL ⚠1 — 3"= 1'-0"



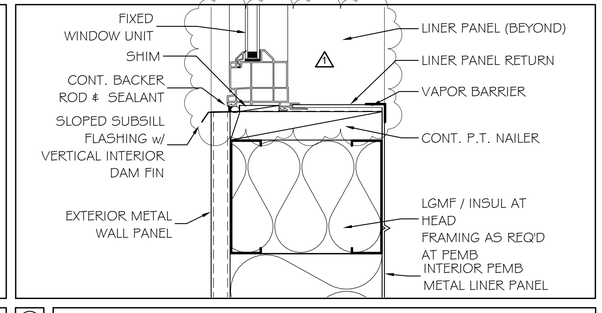
③ KICKER WALL DETAIL ⚠1 — 1½" = 1'-0"



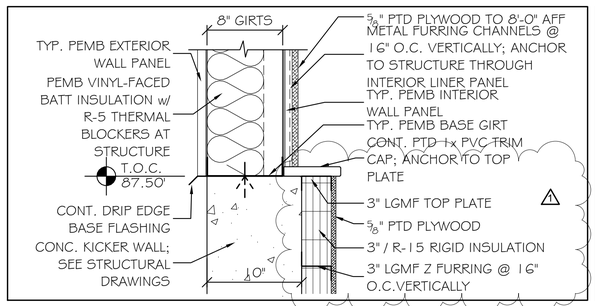
⑦ SILL AT OVERHEAD SECTIONAL DOOR/EXT. METAL PANEL — 1½" = 1'-0"



⑪ EXT. H.M. DOOR SILL DETAIL — 3"= 1'-0"



⑮ WINDOW SILL DETAIL ⚠1 — 3"= 1'-0"



④ KICKER WALL DETAIL ⚠1 — 1½" = 1'-0"

⑧

⑫

⑯

Scale: 12" = 1'-0"

No.	Revision	By	Date
⚠1	ADDENDUM 1	MFH	12/02/21

Designed by: MICHAEL F. HAYS, RA

ISSUED FOR BID - NOT FOR CONSTRUCTION

LICENSED ARCHITECT MICHAEL F. HAYS No. 1724 STATE OF MAINE

	By	Date		By	Date
Designed:	MFH	11/22/21	Checked:	MFH	11/22/21
Drawn:	MGK	11/22/21			

GRANT HAYS ASSOCIATES
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207.871.5900 www.granthays.com

AEI PROJ.NO.: 20019 | CAD FILE:

MAINE TURNPIKE

THE GOLD STAR MEMORIAL HIGHWAY

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

CONTRACT 2021.06
CROSBY VEHICLE STORAGE GARAGE
DETAILS

SHEET NUMBER: A-7

CONTRACT: 2021.06