

Addendum D1

re: **Centerville-Abington Community Schools**
Centerville-Abington Transportation Building
 473003.00

issue date: **March 10, 2022**

This Addendum forms a part of the Contract Documents for the above-referenced project and is issued in accordance with the Instructions to Bidders. Acknowledge receipt of this addendum by inserting its number in the space provided in the bid form.

ITEM	LOCATION	DESCRIPTION
A1.01	GENERAL Vehicle Lift Installation Drawings (For Reference Only)	<u>GENERAL</u> Vehicle lift installation drawings reissued for REFERENCE ONLY. Lift by separate Owner contract.
A1.02	SPECIFICATION Section 021111 Soils Report (New Specification)	<u>ADD:</u> ADD NEW Specification Section 021111 – Soils Report dated March 10, 2022 as an integral part of the project construction documents.
A1.03	SPECIFICATION Section 077253 Snow Guards (New Specification)	<u>ADD:</u> ADD NEW Specification Section 077253 – Snow Guards dated March 10, 2022 as an integral part of the project construction documents.
A1.04	SPECIFICATION Section 087100 Door Hardware (New Specification)	<u>ADD:</u> ADD NEW Specification Section 087100 – Door Hardware dated March 10, 2022 as an integral part of the project construction documents.
A1.05	SPECIFICATION Section 133419 Metal Building Systems (New Specification)	<u>ADD:</u> ADD NEW Specification Section 133419 – Metal Building Systems dated March 10, 2022 as an integral part of the project construction documents.



Addendum D1

Centerville-Abington Transportation Building

March 10, 2022

Page 2

ITEM	LOCATION	DESCRIPTION
A1.06	SPECIFICATION Section 412200 Cranes and Hoists (New Specification)	<u>ADD:</u> ADD NEW Specification Section 412200 – Cranes and Hoists dated March 10, 2022 as an integral part of the project construction documents.
A1.07	DRAWING A3.1	<u>CHANGE:</u> CHANGE Note 3 to read as follows: “Base Bid: Provide w-beam for Owner-provided hoist. Alternate #3: Provide basis of design Crane-Tec monorail crane system. Reference specification for more information.” Drawing not reissued.
A1.08	DRAWING A4.0 (Drawing Reissued)	<u>CHANGE:</u> Door/Frame Schedule revised to show Hardware Sets.
A1.09	DRAWING A5.0 (Drawing Reissued)	<u>CHANGE:</u> Drawing is reissued in its entirety.
A1.10	A6.10 (Drawing Reissued)	<u>CHANGE:</u> Drawing is reissued in its entirety.
A1.11	DRAWING A6.17 (Drawing Reissued)	<u>CHANGE:</u> Drawing is reissued in its entirety.
<u>STRUCTURAL:</u>		
S1.01	DRAWING S1.1a Details 1 & 2 (Drawing Reissued)	<u>CLARIFICATION:</u> Sheet reissued to correct section references on Details 1 and 2.

Addendum D1

Centerville-Abington Transportation Building

March 10, 2022

Page 3

ITEM	LOCATION	DESCRIPTION
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PLUMBING:

P1.01 GENERAL
Specifications & Drawings

ADD:

Attached please find Addendum 1 write up from SCO Engineering, LLC dated March 10, 2022 addressing Plumbing items.

ELECTRICAL:

E1.01 GENERAL
Specifications & Drawings

ADD:

Attached please find Addendum 1 write up from SCO Engineering, LLC dated March 10, 2022 addressing Electrical items.

Submitted by:

The Moake Park Group, Inc.



Jeff E. Schroeder
Project Architect



- attachments:** Vehicle Lift Installation Drawings (REFERENCE ONLY)
Specification 021111
Specification 077253
Specification 087100
Specification 133419
Specification 412200
SCO Engineering Write-Up dated 03/10/22
Drawing A4.0
Drawing A5.0
Drawing 6.10
Drawing 6.17
Drawing S1.1a
Drawing E3.2

copies: All Plan Holders
473003/670

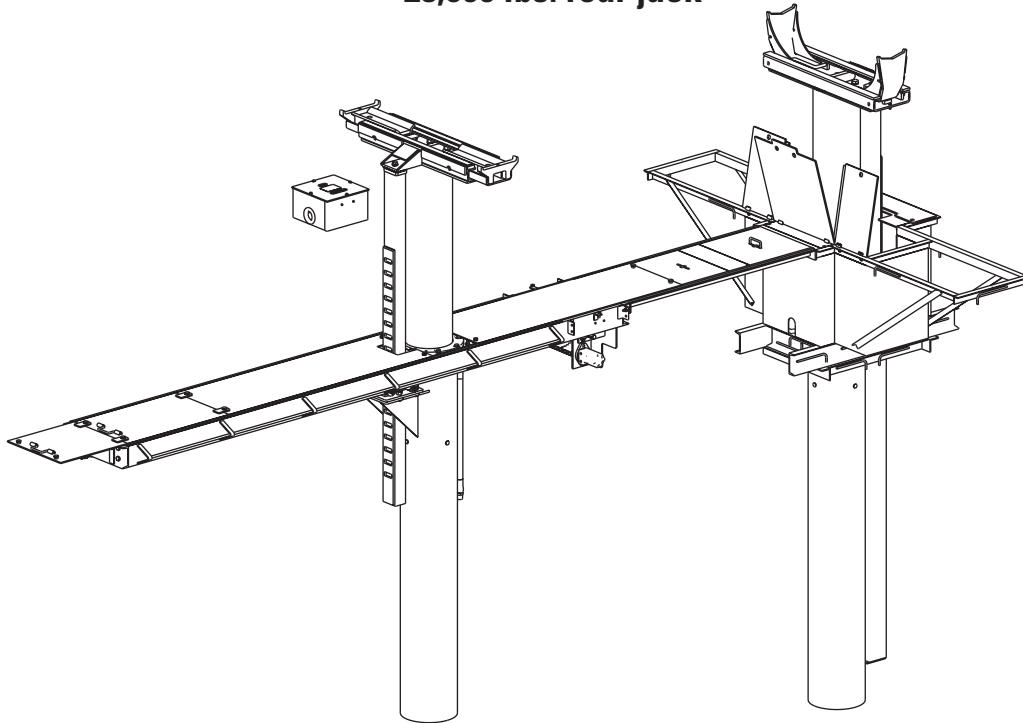


Model: 70Q 200 Series

Capacity 50,000lbs.

25,000 lbs. front jack

25,000 lbs. rear jack



⚠ IMPORTANT Reference ANSI/ALI ALIS, Safety Requirements for Installation and Service of Automotive Lifts before installing lift. Do not install outdoors.

Recommended Fluid Specifications for Rotary Lifts

Fluids recommended for use in automotive lifts should conform to the following specifications.

Viscosity Range: 150 SUS (32CST) ISO32 / 10W
 Aniline Point: 210° F Min.
 Viscosity Index: 95 Min.
 Additives: Anti-Foam
 Anti-Rust
 Anti-Oxidation
 Pour Point: 20° F below operating temp.

IMPORTANT We assume no responsibility for installation errors where instructions other than those shipped with equipment are used.

INSTALLATION SAFETY OPERATION AND MAINTENANCE INSTRUCTIONS

Index

Index	2	Control Box Piping	8
Glossary	2	Wiring Power Unit (Electric)	10
Installation Instructions	2	Ballast	10
Wheelbase Range	2	Fluid Filling	10
Wheelbase Chart	3	Bleeding	10
Lift Location	3	Testing	11
Soil Testing.....	5	Air Operated Multi-Position Locks.....	11
Excavation	5	Rear Jack Leveling and Grouting.....	11
Pipe Stub-in Detail	5	Installing Superstructure, Cover Plates and Nameplates.....	11
Installation of Front Frame	5	Safety Instructions	13
Rear Jack Housing	6	Owner/Employer Responsibilities	13
Concrete Work	6	Operating Instructions	14
Rear Jack Installation	7	Maintenance Instructions	15
Power Unit	7	Safety Warning Labels for Inground Lifts	16
Front Jack Installation	7		

Glossary

Adjustment - How far the front jack moves. Rotary's standard Adjustment is 102".

Extensions - Increases to Adjustment are in one (1) foot increments, i.e.: one (1) foot extension. Adjustment and Extensions determine track and trench length.

Wheelbase - Maximum and minimum pick-up positions. Minimum wheelbase range determines how far apart the trench or track is located from the rear jack.

INSTALLATION INSTRUCTIONS

Installer: Please follow these instructions to ensure a good installation and satisfactory operation of the lift.

Check Shipment: Check your shipment against the shipping papers. Enter claims for damage or shortage with the delivering carrier at once.

- After installation, please return this booklet to the literature package and give to lift owner/operator.
- Literature package should be maintained for easy access for lift operator.
- Review entire installation instructions before beginning excavation.

1. Wheelbase Range:

- A. To determine "U" and find "X" dimension as shown in Fig. 2, see Wheelbase Chart.
1. Read down the Min. W/B column to the proper minimum wheelbase (if your wheelbase is not on the chart, choose the next lesser dimension), then to the left is the "U" dim.
 2. Go back across to the maximum wheelbase (if your wheelbase is not on the chart, choose the next higher dimension), then go to the top of the column to the "X" dimension (frame length).

vided for reference during installation or specification.

- B. Wheelbase Range _____ in. to _____ in.
Dimensions "U" _____ in. "X" _____ in.

C. Enter minimum and maximum wheel bases in the space provided above.

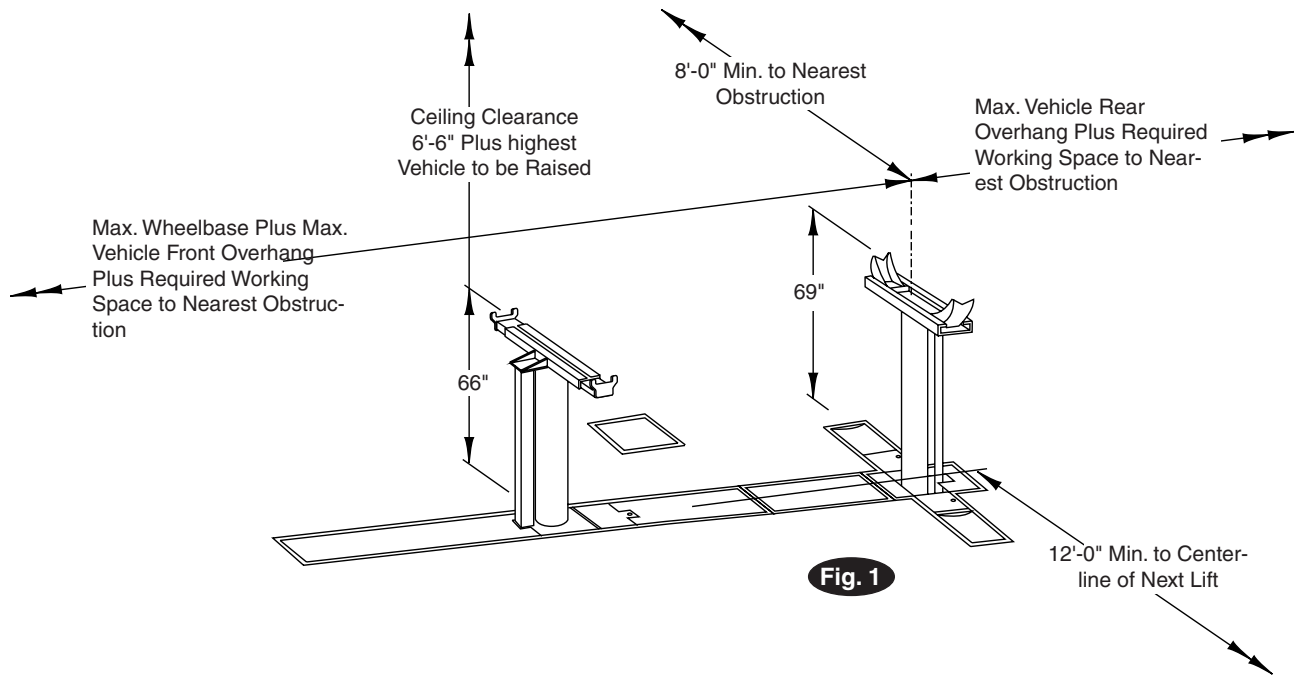
3. Example: If the wheelbase range of the vehicles to be serviced is 101" to 203", then locate the 101" in the Min. WB. column and the next column left is the "U" dim. of 76.75". Now, read across to the right to 203" and to the top of that column for the "X" dim. (frame length) of 12'-0".

IMPORTANT Enter "U" dim. and "X" dim. in the space pro-

WHEELBASE CHART

		For Model 70Q													
		"Z" Dimension (Trench Length) "X" Dimension + "U" Dimension + 17 1/2"="Z"													
		Std.	"X" Dimension Frame Length												
"U"	Min. W/B	12'-0"	13'-0"	14'-0"	15'-0"	16'-0"	17'-0"	18'-0"	19'-0"	20'-0"	21'-0"	22'-0"	23'-0"	24'-0"	25'-0"
		Maximum Wheelbase													
70.75	95	197	209	221	233	245	257	269	281	293	305	317	329	341	
76.75	101	203	215	227	239	251	263	275	287	299	311	323	335		
82.75	107	209	221	233	245	257	269	281	293	305	317	329	341		
88.75	113	215	227	239	251	263	275	287	299	311	323	335			
94.75	119	221	233	245	257	269	281	293	305	317	329	341			
100.75	125	227	239	251	263	275	287	299	311	323	335				
106.75	131	233	245	257	269	281	293	305	317	329	341				
112.75	137	239	251	263	275	287	299	311	323	335					
118.75	143	245	257	269	281	293	305	317	329	341					
124.75	149	251	263	275	287	299	311	323	335						
130.75	155	257	269	281	293	305	317	329	341						
136.75	161	263	275	287	299	311	323	335							
142.75	167	269	281	293	305	317	329	341							
148.75	173	275	287	299	311	323	335								
154.75	179	281	293	305	317	329	341								
160.75	185	287	299	311	323	335									

Lift Location

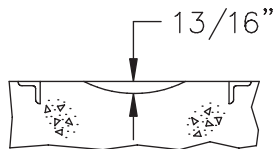


2. Lift Location:

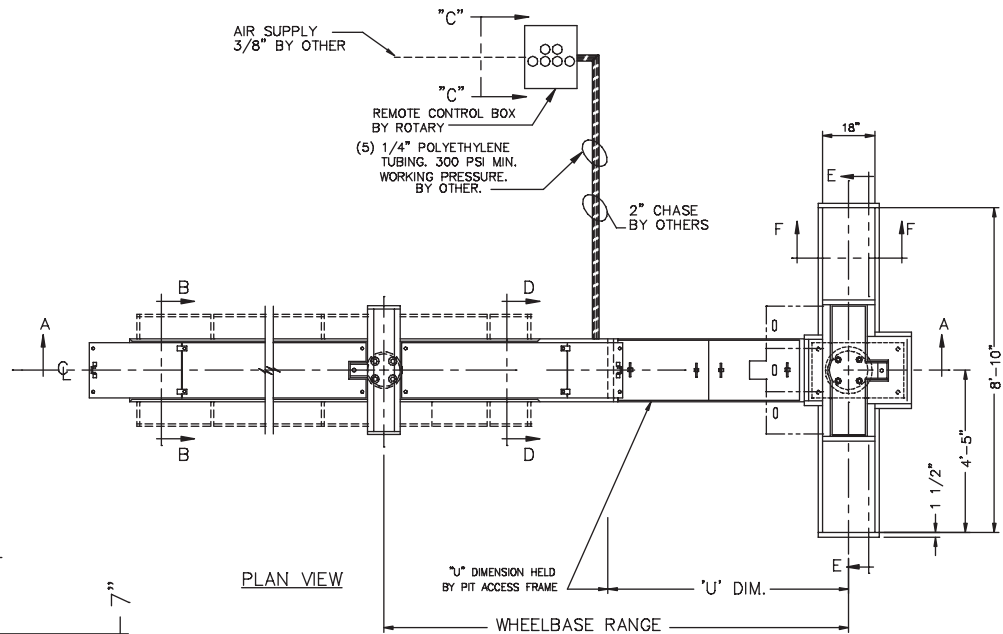
- A. Check architect's layout if available for lift placement.
- B. Locate lift centerline in desired area, Fig. 1.
Note: The centerline of the rear jack housing is 90° to the lift centerline.
- C. Check for required work space around proposed lift/vehicle placement.
- D. Overhead clearance required is 6'-6" plus highest vehicle to be raised.

3. Soil Testing:

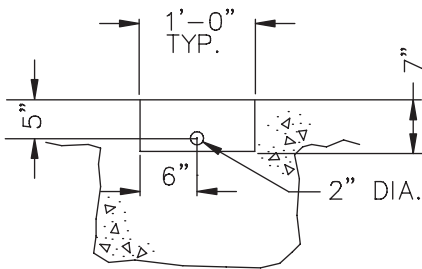
IMPORTANT Test soil to determine corrosive characteristics. Take necessary measures to protect inground equipment with one of the many cathodic protection systems. Failure to provide underground protection when indicated by soil test could cause fluid leaks to develop in hydraulic system, resulting in costly repairs or making the equipment inoperative and unsafe.



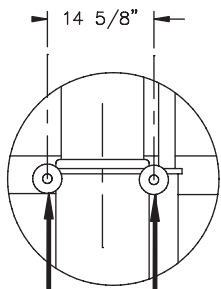
SECTION F-F



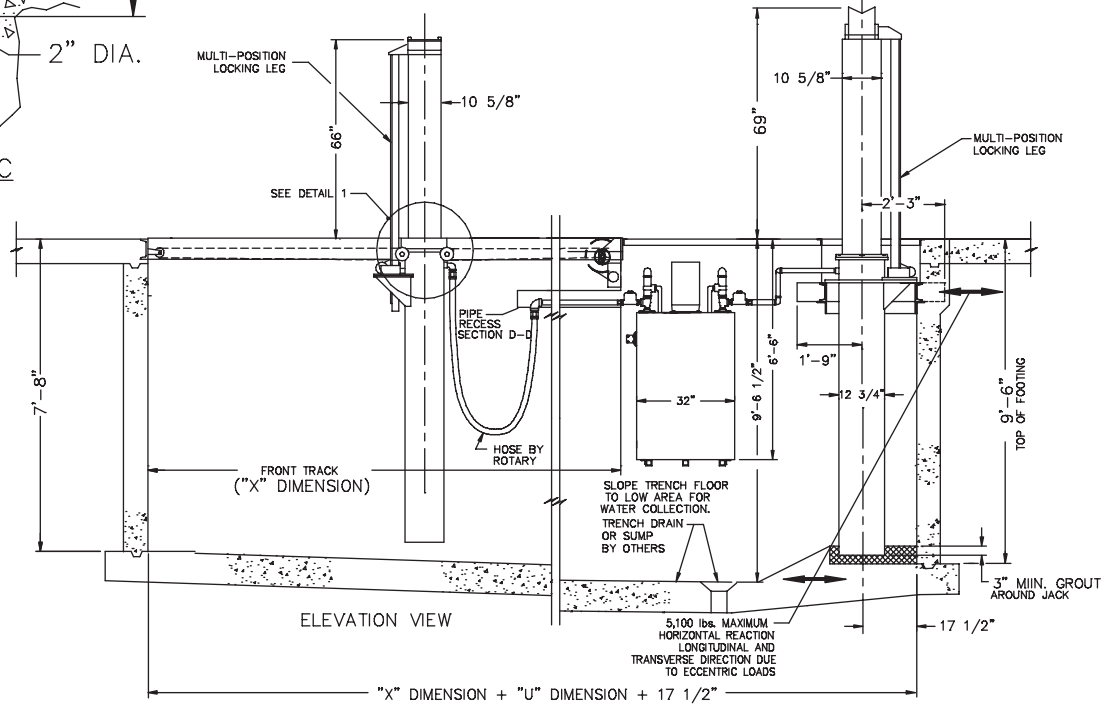
PLAN VIEW



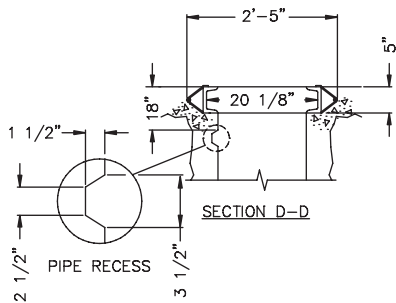
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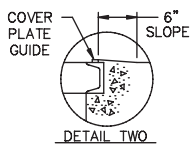
12,500 lbs. VERTICAL REACTION EACH OF (4) WHEELS INCLUDES IMPACT
DETAIL ONE



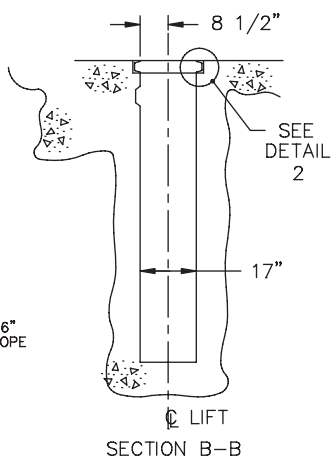
ELEVATION VIEW



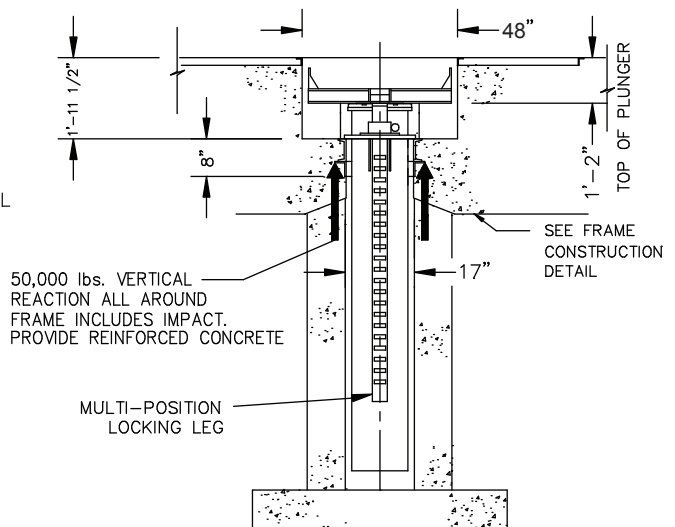
SECTION D-D



DETAIL TWO

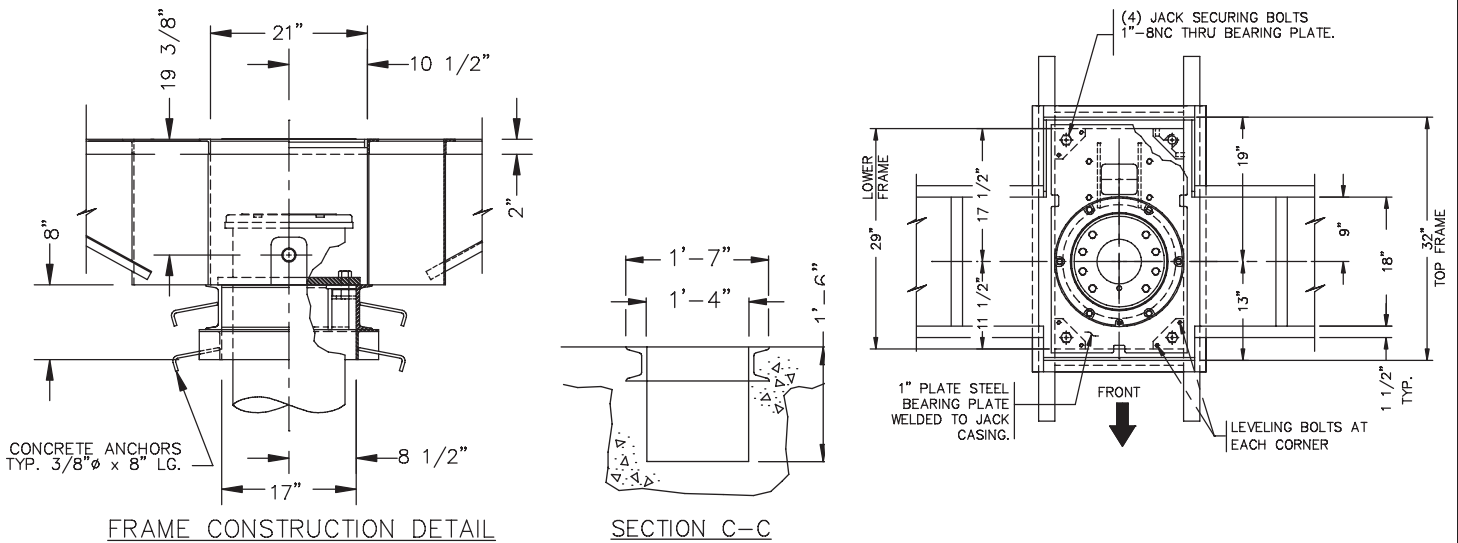


SECTION B-B



SECTION E-E

Fig. 2



4. Excavation: **ATTENTION** Restrict all persons from going near excavation. OSHA standard prohibits anyone from getting in excavated hole, unless OSHA guidelines are followed. See OSHA Excavating Standard CFR 1926. Keep excavated hole covered and barricade excavated area, when work is not in process. All concrete thickness shall meet all local and national building codes.

- A. Locate lift centerlines in desired area in accordance with the information provided in Fig. 1.
- B. Place the rear housing upside down on the floor aligned on center line. Set the front track upside down on center line of service bay. Align the intermediate frame with front frame and rear housing. Check "U" dimension, Fig. 2 from rear center line. Decide position of control box, Fig. 2 is only an example.
- C. Mark excavation outline around frames.
- D. Remove frames and excavate front trench, and rear jack housing carefully to dimensions in Fig. 2.
- E. The trench walls shall be sized to handle the vertical reaction of each jack, see Fig. 2 for vertical reaction and application.
- F. Locate drain or sump pump in the trench. See elevation drawing, Fig. 2.

5. Stub-In Detail (control box):

Working pressure is 350 psi and all piping, fittings, and hoses should be specified accordingly. Be sure all piping conforms to local and state codes. All piping supplied by installing contractor. Wash out all pipe with solvent and blow dry with air before installing. **IMPORTANT** Always use a good joint sealant on pipe threads. Do Not use teflon tape. For welded pipe, flush system and install an inline fluid filter.

- A. Stub-in air supply line chase from desired control box location to front trench.
- B. Stub-in Electrical Conduit from motor starter to power unit motor.

6. Installation of Front Frame:

- A. Pour the concrete for the trench floor. Level or slope towards drain in trench floor, Fig. 2 Section A-A.
- B. Carefully space $\frac{1}{2}$ " reinforcing rods 8'-6" long around excavation driven vertically into trench floor before it sets.
- C. Build concrete forms having outside dimensions identical with the inside of the front frame and trench, Figs. 2 & 3.
- D. Build concrete forms for control box Figs. 2, section "H-H".
- E. Set form in trench. Visually inspect frame for shipping damage. Be sure frame is not warped or bent. Do Not remove shipping braces.

F. Clamp front frame to concrete form. Measure frame at several points along its length and maintain 17" between side channels, Fig. 2, section "B-B". Check/install spacers inside **IMPORTANT** of track every 18" on center to hold the correct dimension, Fig. 2, section "D-D". Recheck trench center line and dimension "U".

G. Level the form assembly with a level. Frame must be level side to side, check at 1'-0" intervals to be sure, shim as required. Maximum frame slope front to rear is $\frac{1}{8}$ " per foot. Shore form for stability. Make sure the top of frame is at finish floor elevation.

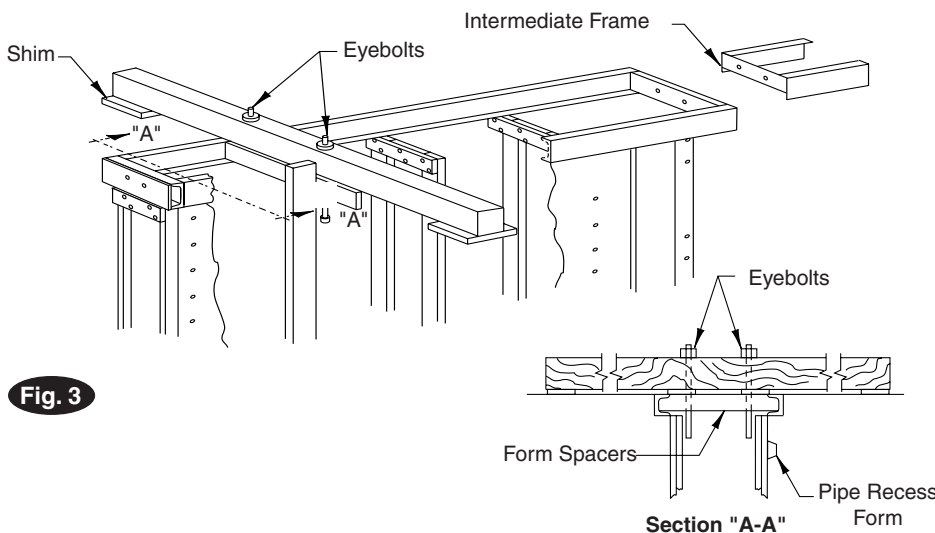


Fig. 3

H. Wire or weld vertical trench concrete reinforcing bars to the frame reinforcing bars. Bend or cut off bars that would stick out of floor.

7. Rear Jack Housing:

A. Remove housing doors, coverplates and hinges to prevent damage. Lower the rear frame into the excavation until top surface of frame is flush with finished floor. Housing opening should be towards the front jack.

Note: Inspect housing for any damage that may have occurred. If housing is bent, straighten.

B. Assemble intermediate frame between front frame and rear frame. The intermediate frame is fastened to the rear of the front frame with (2) $\frac{3}{8}$ "-16 NC Hex nuts and lockwashers, and the front of the rear frame with (2) $\frac{3}{8}$ "-16NC Hex Hd. bolts $1\frac{1}{4}$ " lg., lockwashers and hex nuts, Fig. 4.

C. The intermediate frame holds the correct distance between the front and the rear frames ensuring the correct wheelbase range.

D. Set power unit support tubes in place. The support tubes will be located in the intermediate frame location, Fig. 5 and Fig. 2. Support tubes must be in place before making concrete pour. Support tubes must support 1,400 lbs, Fig. 5.

E. Check alignment of frames with lift and housing center lines and recheck all dimensions, Fig. 2.

8. Concrete Work:

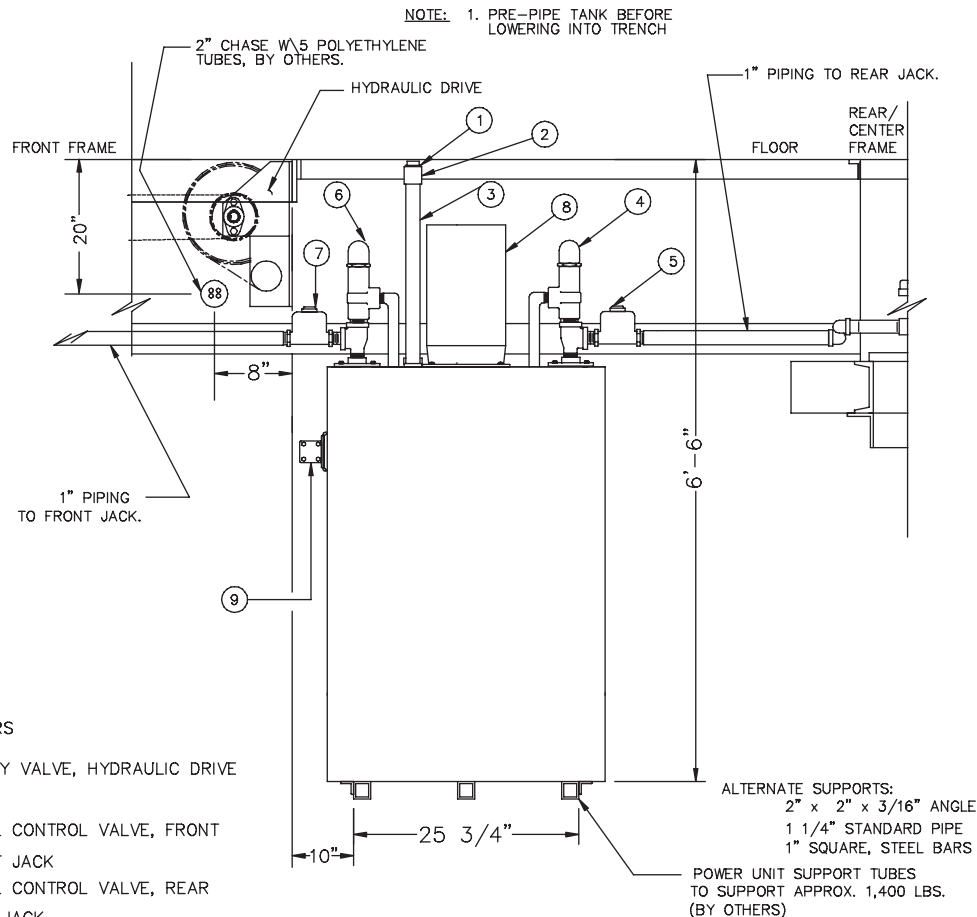
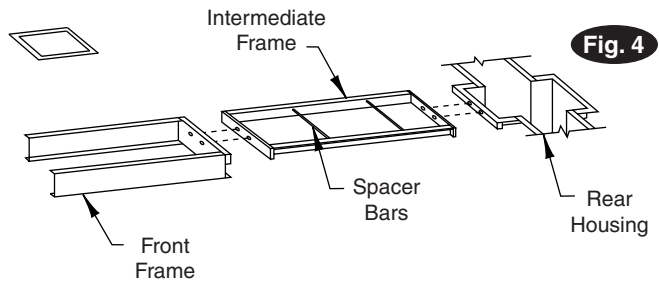
ATTENTION

The concrete reinforcement sizes and reinforcement specifications for the side walls and bases of the trenches, normal or seismic conditions shall be determined by an architect or engineer and shall be determined considering the soil conditions at the site and the applied loading.

A. Check forms to be sure they are shored and braced.
 B. Pour the concrete trench walls. The concrete should be mixed dry enough so that it will not float the wooden forms.

Note: Pour the rear jack housing floor first to allow it to partially setup before pouring sides. Pour per dimensions in Fig. 2.

C. Recheck front forms to be sure they are shored and braced. Work concrete well under frame channels. Continue to check center lines, level and dimensions while pouring.



NOTE: 1. PRE-PIPE TANK BEFORE LOWERING INTO TRENCH

PIPING – BY OTHERS

ITEM	QTY.	DESCRIPTION
9	1	AIR ACTUATED 4-WAY VALVE, HYDRAULIC DRIVE
8	1	MOTOR
7	1	1" AIR ACTUATED OIL CONTROL VALVE, FRONT
6	1	RELIEF VALVE, FRONT JACK
5	1	1" AIR ACTUATED OIL CONTROL VALVE, REAR
4	1	RELIEF VALVE, REAR JACK
3	1	1 1/4" PIPE x 20 3/4" Lg. BY OTHERS.
2	1	1 1/4" COUPLING, BY OTHERS
1	1	GAGE ROD – BY ROTARY

ALTERNATE SUPPORTS:
 2" x 2" x 3/16" ANGLE
 1 1/4" STANDARD PIPE
 1" SQUARE, STEEL BARS

POWER UNIT SUPPORT TUBES TO SUPPORT APPROX. 1,400 LBS. (BY OTHERS)

Fig. 5

D. Use the wood sweep furnished to form the two wheel depressions, one on each side of the rear housing, Fig. 2, section "F-F".

Note: Finished floor should be flush with top of rear frame and wheel depressions, Fig. 2, Sec. "F-F".

E. After the concrete has set, remove the wooden forms.

9. Rear Jack Installation:

A. Carefully lower jack into frame with jack fluid inlet towards the front. Locate and center the jack with (4) 1" bolts through the jack mounting plate into frame. Do not tighten bolts at this time.

B. Level jack with machinist level across the top of the plunger, Fig. 6. Adjust plunger using (8) 1/2"-13NC x 1 1/2" lg. cap screws, 2 in each corner.

10. Power Unit:

A. Pre-pipe power unit before lowering into trench.

B. Remove spacer bars in intermediate frame, Fig. 4.

C. Install power unit, Fig. 5.

11. Hydraulic Drive:

Bolt hydraulic motor assembly to front frame with (4) 5/8" hex nuts, lock washers and flat washers, Fig. 7.

1. Install (2) 1/2" x 3/8" reducer on hydraulic drive motor ports. Install (2) 3/8" street elbow into reducer.

2. Install (2) 3/8" street elbow into lower side of hydraulic drive valve. Located on front side of power unit.

3. Connect (2) 3/8" x 36" long hoses from hydraulic motor to hydraulic drive valve.

4. Bolt idler sprocket to opposite end of frame with (2) 5/8" hex nuts, lock washers and flat washers.

12. Front Jack Installation:

A. Remove frame spacers, concrete and dirt from tracks. Install carriage axle and roller assemblies midway of the front frame 12 1/2" apart. Roll full length of channels to check clearance.

B. Lower front jack into front trench and onto carriage axles with fluid inlet to the rear. Equalize the clearance on each end of carriage axle with front track, Fig. 8.

C. Level the jack with shims and secure with 3/8" "U" bolts, Fig. 8.

D. Install chain over sprockets with hooks away from sprockets, Fig. 8. Lubricate all bearing surfaces.

E. Attach chain to combination "U" bolt-chain adjusting studs located on carriage/axle assembly with the chain fastener, Fig. 8.

F. Tighten chain with 1/2" jam nut, Fig. 8.

G. Adjust chain until positive movement is achieved with drive assembly, Fig. 8.

H. Install front jack hose. **IMPORTANT** Do Not Kink Hose & do not lose orifice located in casing coupling

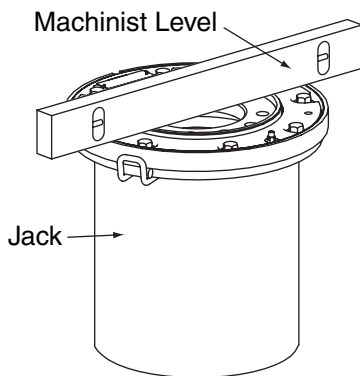


Fig. 6

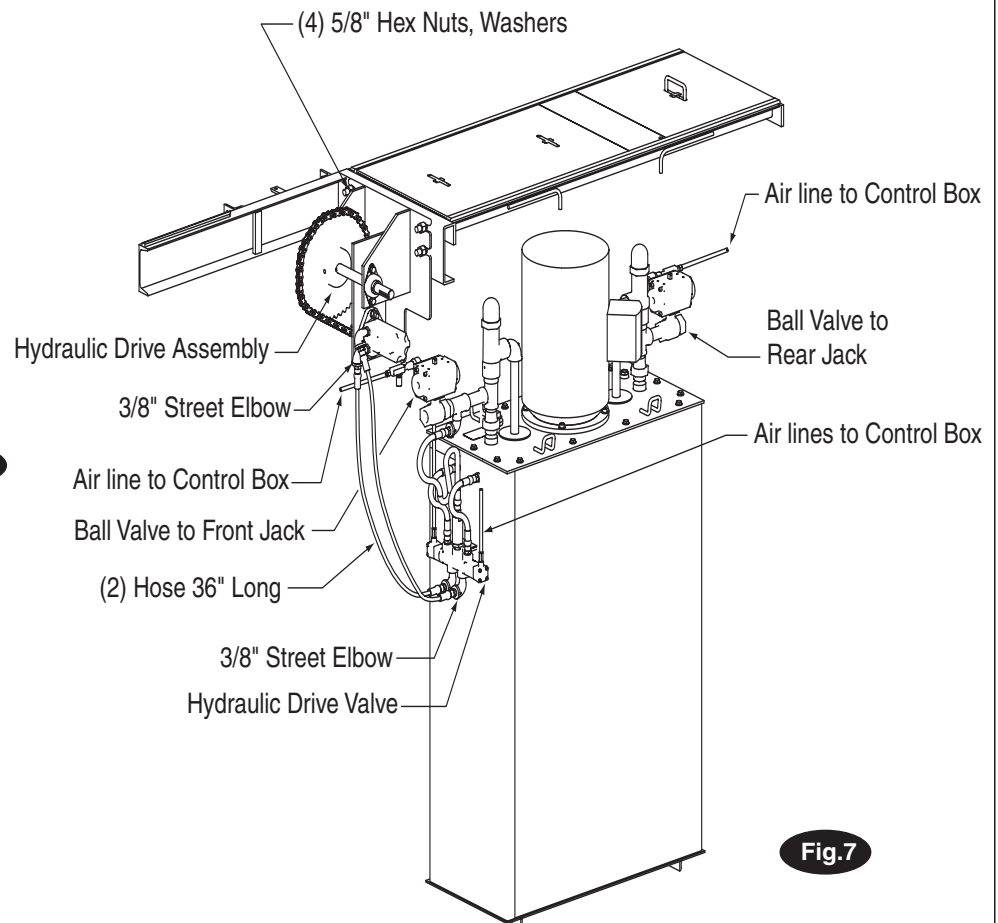


Fig. 7

13. Air Operated Multi-Position Locks:

Install the locking latch assembly onto the jacks mounting bracket studs. Install the 3/4" lock washer and nut but do not tighten down at this time, Fig. 9.

14. Control Box/Piping:

- A. Confirm location of Control Box.
- B. The controls are air actuated and should run satisfactory at 75 to 90 psi. Install a filter/regulator in the air supply drop line.
- C. Connect 3/8" air line from filter regulator to air line in control box Tagged: Air Supply, this line will be connected to the in-line Filter in the Control Box.

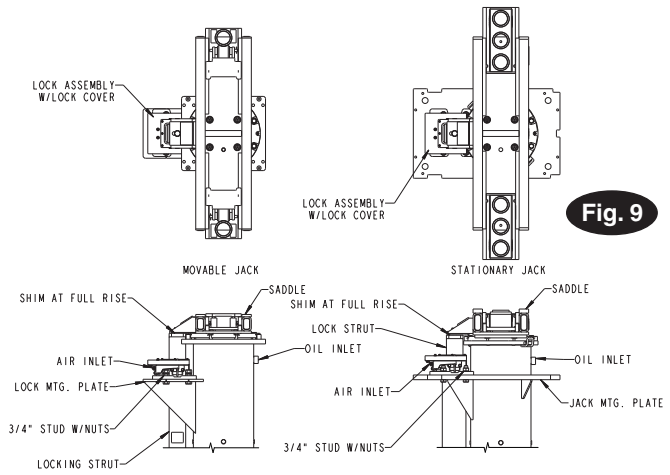


Fig. 9

Air Line Fitting Connection

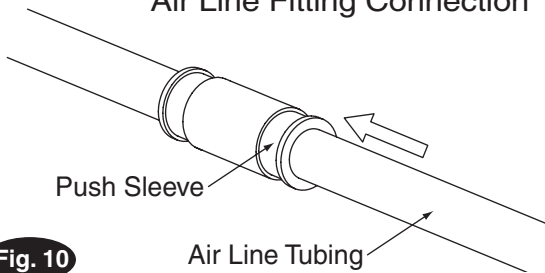


Fig. 10

- D. All connections in Control Box are made with Push Lock type connectors, Fig. 10.
- E. Route all air line from control box to lift through pipe chase, Fig. 11.
- F. Fig. 12, is a general layout of all air line/piping connection points.

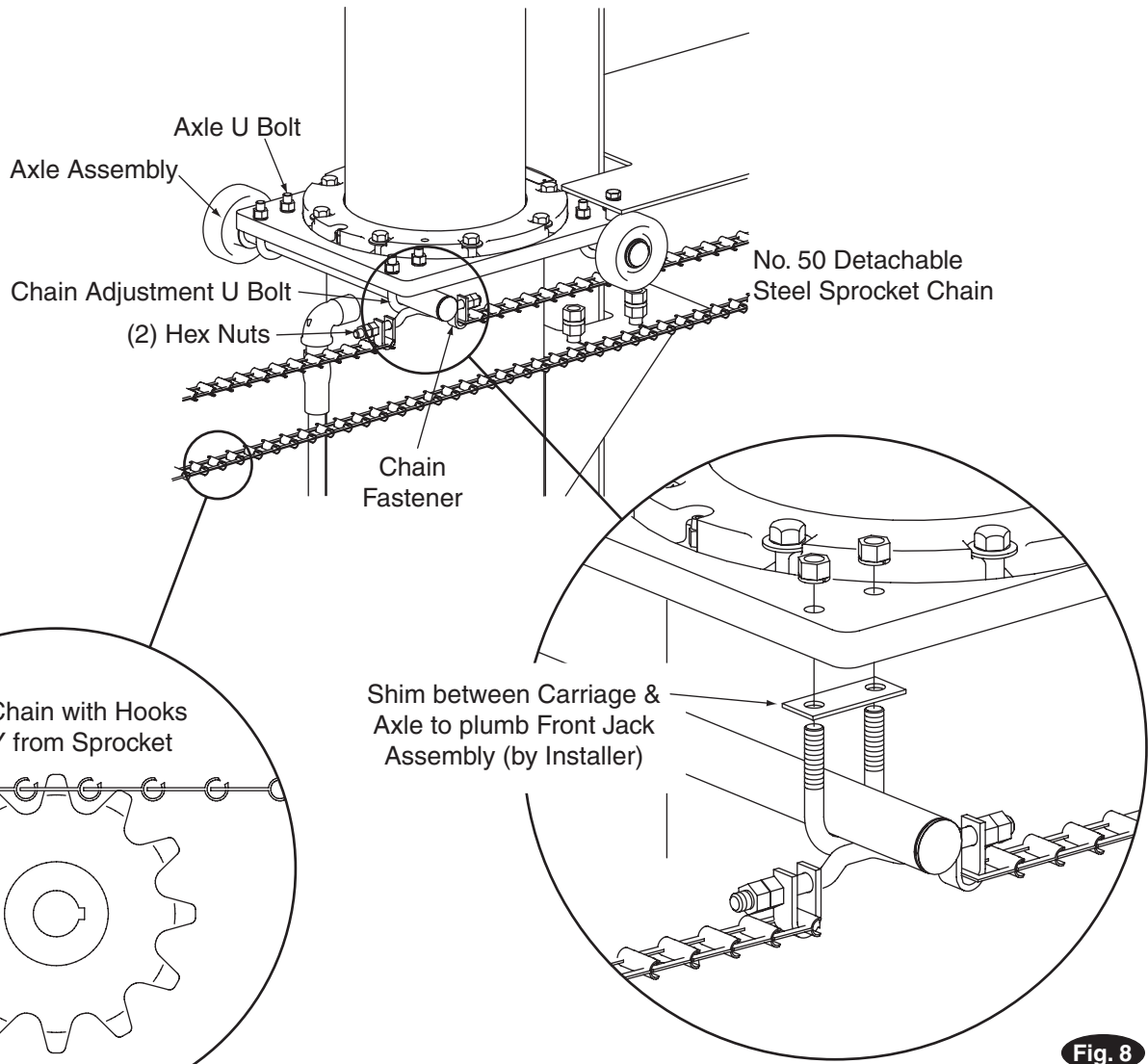


Fig. 8

- G. Located on Hydraulic Drive valve will be two push lock type air line fittings. Connect air line to each of the fittings and route through chase to Control box. Connect to lines Tagged: hydraulic drive Versa Valve.
- H. Locate Ball Valve closest to rear jack. Connect air line to flow control valve, route through chase to Control box. Connect to line Tagged: Ball Valve Rear Jack.
- I. Locate Ball Valve closest to front jack. Connect air line to flow control valve, route through chase to Control box. Connect to line Tagged: Ball Valve Front Jack.
- J. Connect air line to each air cylinder located on the locking latch assembly. Route each line to chase. Place Push "T" in lines. Continue to run single line to Control Box. Connect to line Tagged: Multi-lock air cylinders.
- K. Turn on air supply and check the action of the air buttons, locking latches and valves by actuating the controls. When releasing the button, you should hear the bleed-off air coming out around the valve. Hold air control valve open, check all joints and fittings for air leaks.
- L. Complete hydraulic fluid piping to front and rear jack. See piping detail, Fig. 12.
- M. For lift using left hand controls, lift piping is opposite of right hand controls.

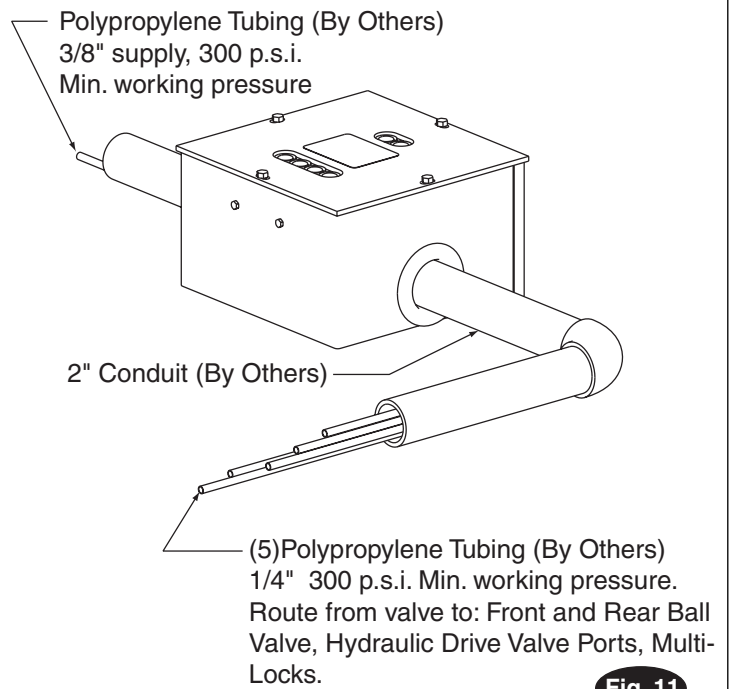


Fig. 11

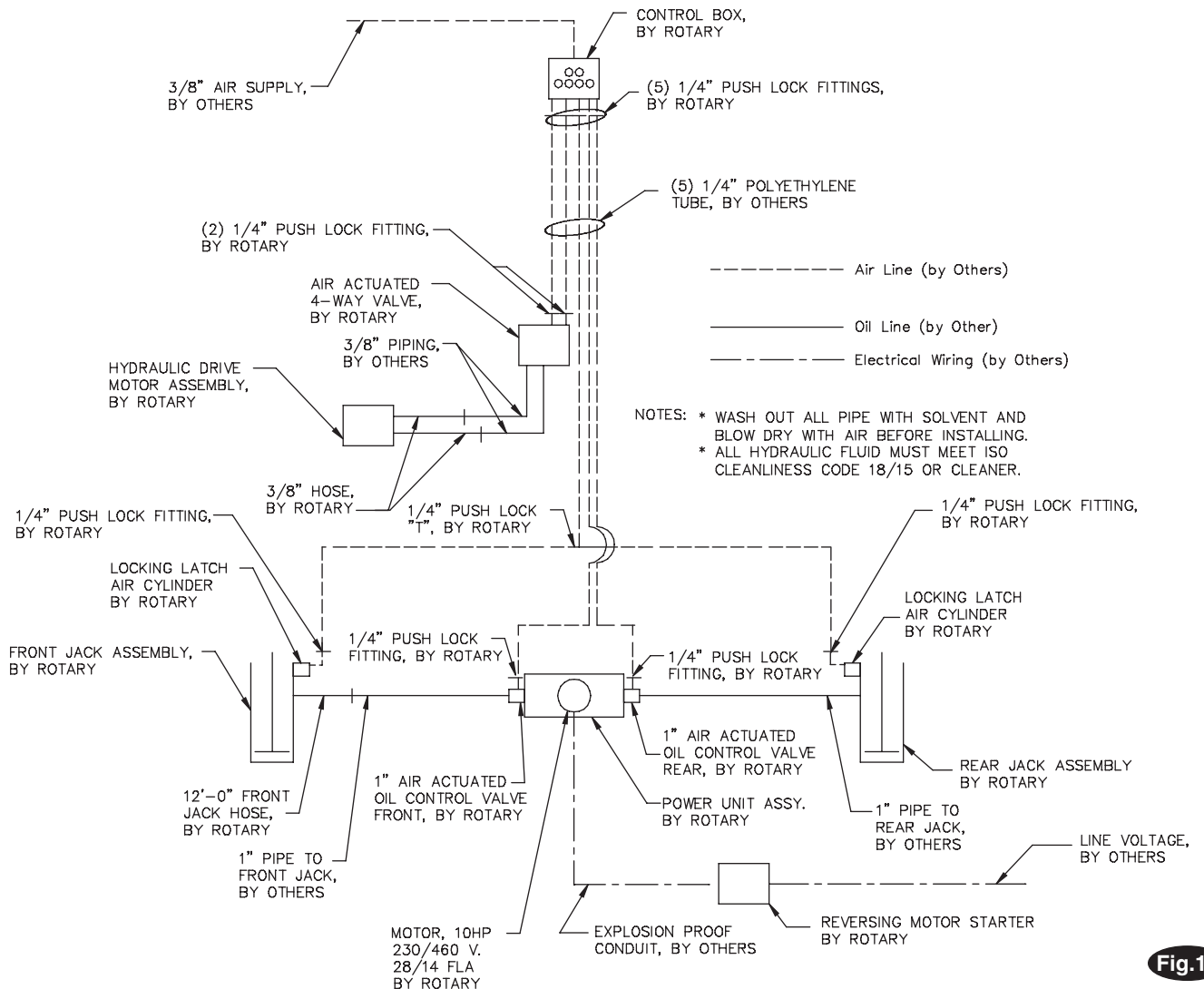


Fig. 12

15. Fluid Filling:

Electric/Hydraulic: Fill power unit tank with fluid. See recommended fluid specifications.

Recommended Fluid Specifications for Rotary Lifts

Fluids recommended for use in automotive lifts should conform to the following specifications.

Viscosity Range: 150 SUS (32CST) ISO32 / 10W
 Aniline Point: 210° F Min.
 Viscosity Index: 95 Min.
 Additives: Anti-Foam
 Anti-Rust
 Anti-Oxidation
 Pour Point: 20° F below operating temp.

16. Wiring Power Unit (electric/hydraulic):

Power unit motor is controlled by a Reversing Motor Starter. "Up-Stop-Down" starting switch, must be located in full view of lift. See wiring schematic for single motor unit, Fig. 13.

17. Ballast: Add 500 lbs. ballast to inside of both plungers to improve lowering when the lift is not loaded. Clean jack seal and gland area.

18. Bleeding:

Electric/Hydraulic:

A. Open bleeder at jack (2) full turns, Fig. 14.

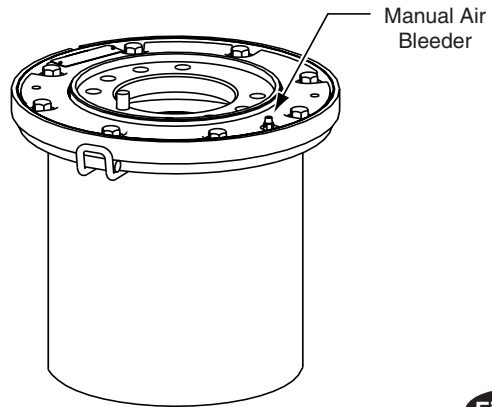


Fig. 14

B. Start power unit and slowly admit flow of fluid to ONE jack. Do Not raise plunger over 2'-0".

C. When constant stream of fluid appears at bleeder, close valve and tighten bleeder.

Note: Jacks may be damaged if lift is operated without being fully bled of air.

D. Repeat procedure with other jack.

E. Lower jacks and refill power unit tank to gage level.

F. Check packing gland bolts, torque to 150 ft.-lbs. and tighten bleeders.

G. Operate plunger to full rise several times. If operation is "jerky" lubricate plungers and repeat bleeding procedure.

Reversing Combination Starter Wiring

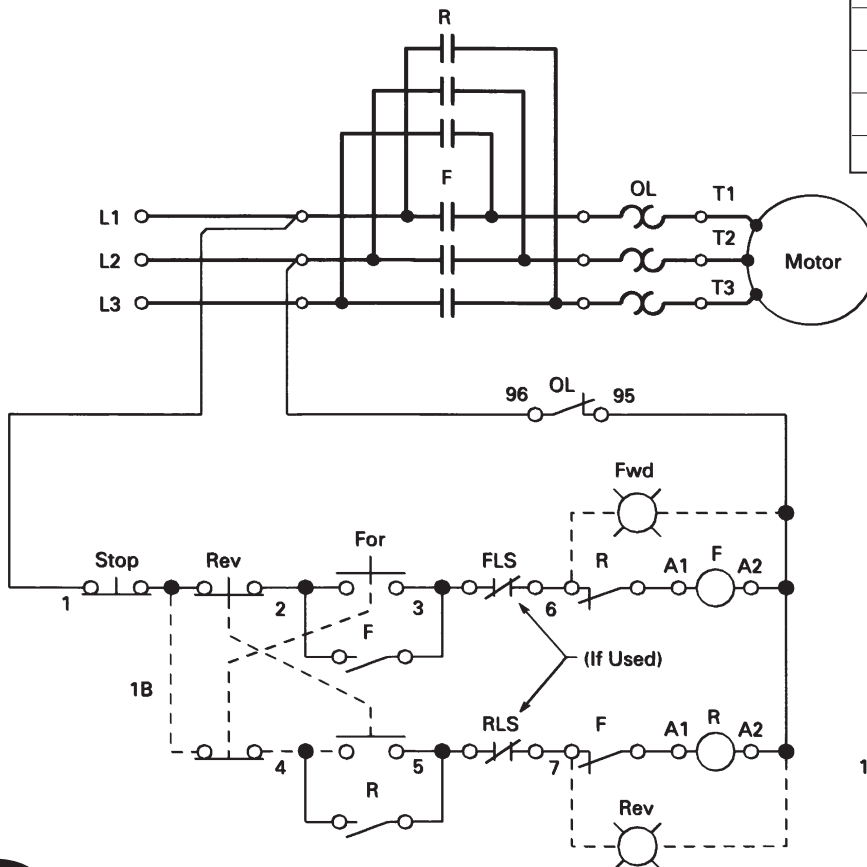
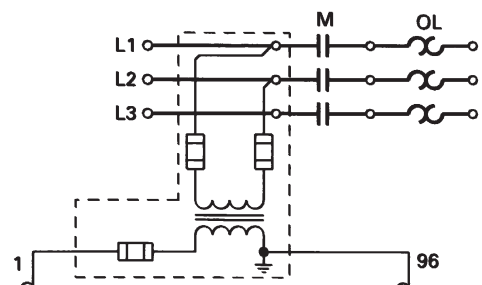


Fig. 13

Lift Model	Electrical Service	Current Required (FLA)
P863-200	208V, 3Ph., 60Hz.	30 Amps.
P863-460	230V, 3Ph., 60Hz.	28 Amps.
P863-460	460V, 3Ph., 60Hz.	14 Amps.
P863-575	575V, 3Ph., 60Hz.	11 Amps.

Control Power Transformer

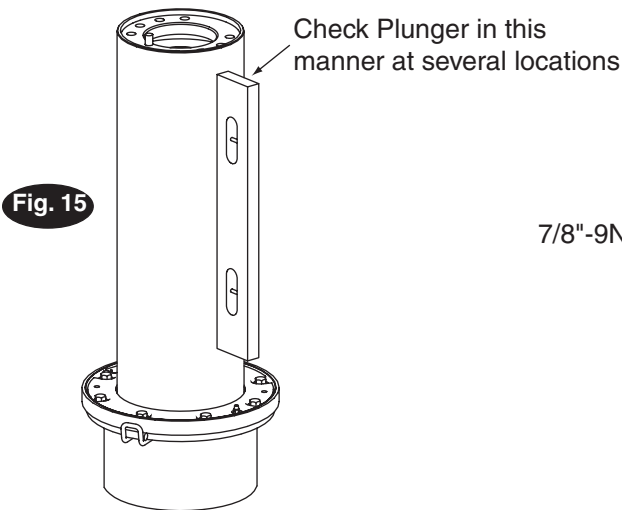


19. Testing:

- A. Raise lift to full rise and leave under pressure for (5) minutes. Do Not leave motor running.
- B. Check all pipe joints for leaks.

20. Rear Jack Leveling and Grouting:

- A. Raise jack to full rise and plumb jack with machinist level on the side of the plunger, Fig. 15.



- B. Use shims under/around 1" bolts if necessary to ensure uniform contact between jack mounting plate and the housing.
- C. Tighten (4) 1" bolts and lockwashers against jack mounting plate.
- D. Recheck plumb of plunger.
- E. Grout around and under the base of the rear jack to withstand horizontal reaction in Fig. 2. Provide at least 3" of grout above the bottom of the jack, Fig. 2.

21. Installing Locking Leg Struts:

- A. Raise each jack plunger about 36".
- B. Actuate the multi-lock control valve button and hold open so the locking latches will be in the unlocked position. Install the struts so the top of the strut is just below the top of the jack plunger. Release control valve button so locking latches can engage the strut and hold it in place, Fig.16.

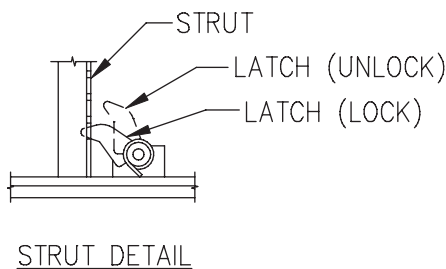


Fig. 16

22. Installing Superstructures, Coverplates and Nameplates

Superstructure:

- 1. Front:
 - a. Clean threads in front plunger bolting ring.

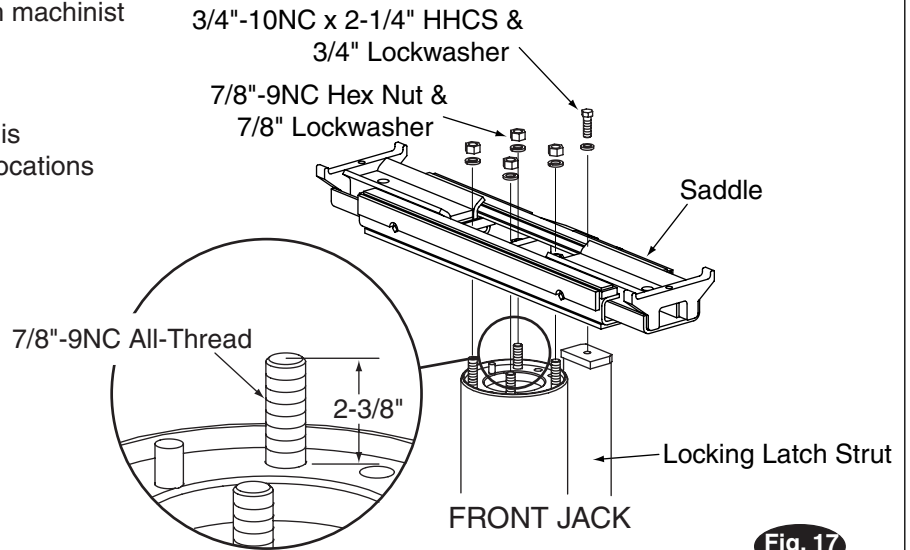


Fig. 17

- b. Apply Lockite 262 Red (provided in kit) to the threads in the front plunger and bottom 1/2" threads of studs.
 - c. Screw 7/8" all-thread studs into plunger, Fig. 17.
 - d. Wait 15 minutes for lockite to set-up.
 - e. Place saddle on plunger over all-thread studs.
 - f. Insert 7/8" nuts and lockwashers on all-thread studs. Torque 7/8" nuts to 150 ft.-lbs.
- 2. Rear: Bolt rear saddle to plunger, Fig. 18.

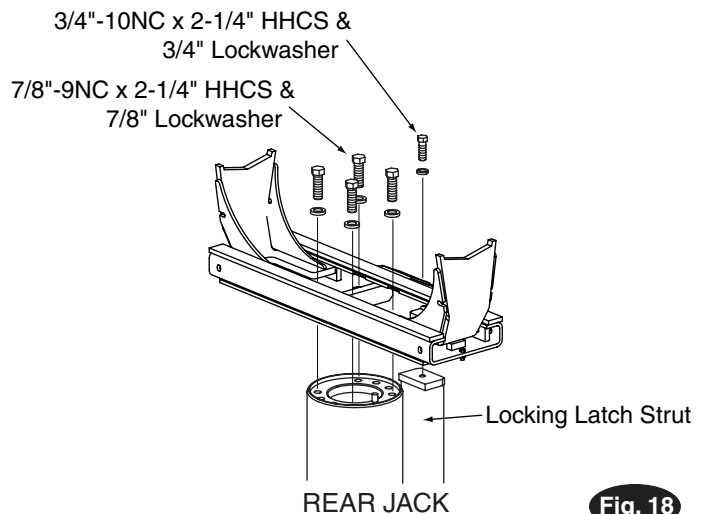


Fig. 18

- 3. Tighten saddle to plunger bolts to 150 ft.-lbs.
- 4. Bolt struts to saddles but do not tighten.
- 5. Install adapters and replace 3/8" stop bolts in saddles.

6. Locking Latch:

- a. Raise jack plungers to full rise.

b. Square up face of locking latch with notches in strut. Tighten $\frac{3}{4}$ " nuts to secure locking latch assembly to jack mounting bracket. Torque to 90 ft-lbs, Fig. 19.

c. The top of the locking latch should be $\frac{1}{4}$ " - $\frac{3}{8}$ " below

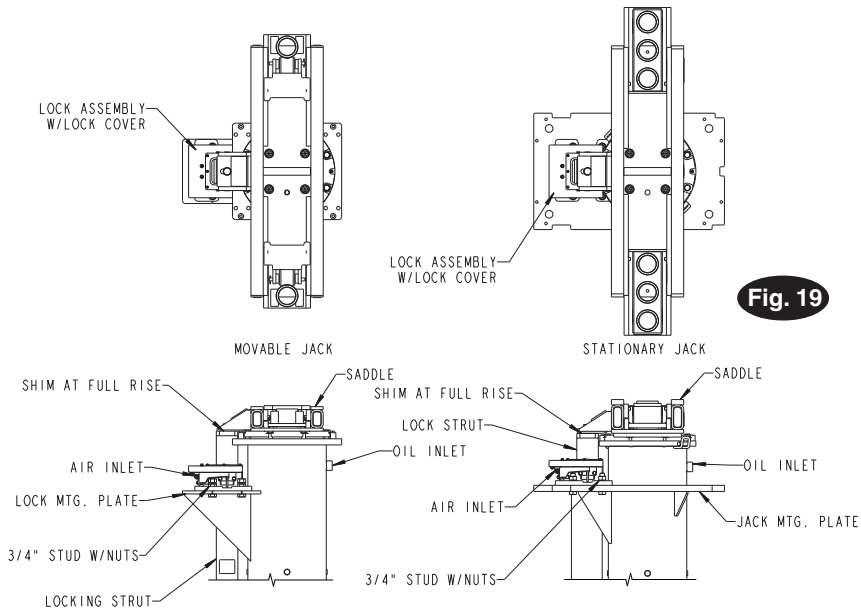


Fig. 19

the top of the last slot in strut. Make necessary adjustments by placing horseshoe shaped shims (by Rotary) between the top of the strut and saddle. Torque $\frac{3}{4}$ " bolts to 150 ft-lbs.

7. Cycle lift several times to check operation.
 - a. Bolt the trench cover plate ahead of front jack and notched cover plate to the rear. Cover plates must slide freely between cover plate guides.
 - b. Position intermediate cover plates between guides located on intermediate frame, between rear housing and front main frame.

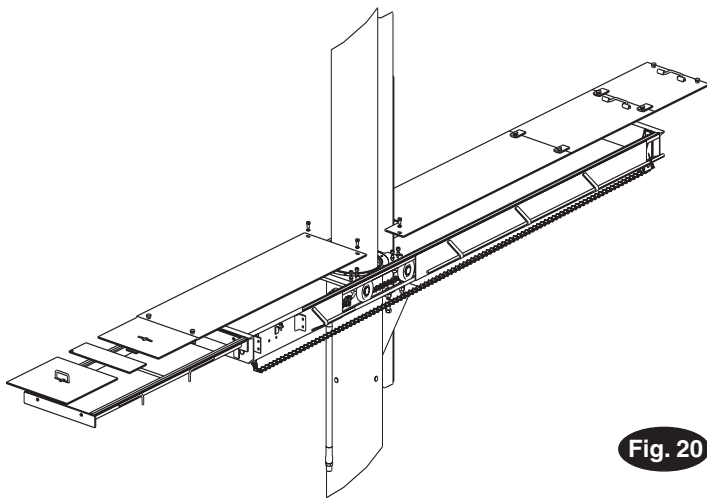


Fig. 20

8. Mount the lift identification/nameplate plaque near lift controls.
 - a. See nameplate package and instructions for placement of capacity nameplates on the lift.

SAFETY INSTRUCTIONS

- **Daily** inspect your lift. Never operate if it malfunctions or if it has broken or damaged parts. Use only qualified lift service personnel and genuine Rotary parts to make repairs.
- **Thoroughly** train all employees in use and care of lift, using manufacturer's instructions and "Lifting It Right" and "Safety Instructions" supplied with the lift.
- **Never** allow unauthorized or untrained persons to position vehicle or operate lift.
- **Prohibit** unauthorized persons from being in shop area while lift is in use.
- **Do Not** permit anyone on lift or inside vehicle when it is either being raised or lowered.
- **Always** keep the front trench cover plates in position to securely cover the trench at all times.
- **Always** keep rear housing doors closed when lift is not being used.
- **Always** keep area around lift free of tools, debris, grease and oil.
- **Never** Overload lift. Total lift capacity is based on the individual capacity of each jacking unit. Capacity is shown on nameplate affixed to each lift superstructure.
- **Do Not** hit or run over lift saddles or adapters. This could damage lift or vehicle. Before driving vehicle into bay, position saddles and adapters to provide unobstructed entrance onto lift.
- **Always** use the appropriate adapters to contact vehicle at vehicle manufacturer's recommended lift points.
- **Do Not** go under vehicle if locking latches are not engaged.
- **Load** vehicle on lift carefully. Position lift adapters to contact the vehicle at manufacturer's recommended lift points. Raise lift until adapters contact vehicle. Check adapters for secure contact with vehicle. Raise lift to desired working height.
- **Always** keep jacks and vehicle level while raising or lowering.
- **Never** operate lift with locking latches disconnected or inoperative.

CAUTION If you are working under vehicle, lift should be raised high enough for locking latches to engage.

- **Do Not** block open or override self-closing lift controls, they are designed to return to the Off or Neutral position when released.
- **Never** operate the control valve handles with your feet.
- **Remain** clear of lift and vehicle when lowering.
- **Avoid** excessive rocking of vehicle while on lift.
- **Clear** area if vehicle is in danger of falling.
- **Never** arc weld on vehicle while loaded on lift.
- **Remove** tool trays, stands, etc. before lowering lift. Release locking latches before attempting to lower lift.
- **Position** lift saddles and adapters to provide an unobstructed exit before removing vehicle from lift area.
- **Never** increase power unit relief pressure without factory authorization.
- **Do Not** perform any maintenance on the control valves, air or fluid lines, air-fluid tank, power unit tank, jack(s), or check fluid level until lift has been fully lowered and all pressure has been released from system.

Owner/Employer Responsibilities

The Owner/Employer:

- **Shall** ensure that lift operators are qualified and that they are trained in the safe use and operation of the lift using the manufacturer's operating instructions; ALI/SM 07-1, ALI Lifting it Right safety manual; ALI/ST-10 ALI Safety Tips card; ANSI/ALI ALOIM-2008 (R2013), American National Standard for Automotive Lifts-Safety Requirements for Operation, Inspection and Maintenance; ALI/WL Series, ALI Uniform Warning Label Decals/Placards; and in the case of frame engaging lifts, ALI/LP-GUIDE, Vehicle Lifting Points/Quick Reference Guide for Frame Engaging Lifts.
- **Shall** establish procedures to periodically inspect the lift in accordance with the lift manufacturer's instructions or ANSI/ALI ALOIM-2008 (R2013), American National Standard for Automotive Lifts-Safety Requirements for Operation, Inspection and Maintenance; and **The Employer Shall** ensure that lift inspectors are qualified and that they are adequately trained in the inspection of the lift.
- **Shall** establish procedures to periodically maintain the lift in accordance with the lift manufacturer's instructions or ANSI/ALI ALOIM-2008 (R2013), American National Standard for Automotive Lifts-Safety Requirements for Operation, Inspection and Maintenance; and **The Employer Shall** ensure that lift maintenance personnel are qualified and that they are adequately trained in the maintenance of the lift.
- **Shall** maintain the periodic inspection and maintenance records recommended by the manufacturer or ANSI/ALI ALOIM-2008 (R2013), American National Standard for Automotive Lifts-Safety Requirements for Operation, Inspection and Maintenance.
- **Shall** display the lift manufacturer's operating instructions; ALI/SM 07-1, ALI Lifting it Right safety manual; ALI/ST-10 ALI Safety Tips card; ANSI/ALI ALOIM-2008 (R2013), American National Standard for Automotive Lifts-Safety Requirements for Operation, Inspection and Maintenance; and in the case of frame engaging lifts, ALI/LP-GUIDE, Vehicle Lifting Points/Quick Reference Guide for Frame Engaging Lifts; in a conspicuous location in the lift area convenient to the operator.
- **Shall** provide necessary lockout/tagout means for energy sources per ANSI Z244.1-2003 (R2014), Safety Requirements for the Lockout/Tagout of Energy Sources, before beginning any lift repairs.
- **Shall** not modify the lift in any manner without the prior written consent of the manufacturer.

Operating Instructions

WARNING Permit only trained personnel to operate lift. After reviewing these instructions, get familiar with lift controls by running the lift through a few cycles before loading vehicle on lift.

Observe and heed SAFETY and WARNING labels on the lift.

1. Lift must be fully lowered and service bay clear of all personnel and/or other obstructions before vehicle is brought on lift.
2. Position lift saddles and adapters to provide unobstructed entrance of vehicle onto lift.
3. **Spotting:** Position vehicle centered laterally over the lift jacks and rear wheels centered in wheel dishes.
Note: Some vehicles may have a low slung differential housing or rear spring hanger brackets. It will be necessary to open the rear jack housing doors before positioning vehicle over the lift. Some vehicle applications may require adapter selections that are not standard with this lift.
4. **Lift Controls:** The air push buttons are designed to close when released. Do Not block open or override self-closing feature.

5. Loading:

Electric/Hydraulic:

- A. Start power unit by depressing "UP" on Reversing Motor Starter.
- B. Locate the front superstructure under the vehicle manufacturer's recommended lift points by moving the jack forward or backward with the hydraulic drive. The hydraulic drive is controlled by air push buttons located in control box marked "SPOT", Fig. 21.
- C. Slide adapters to proper vehicle manufacturer's recommended lift points. Shift lever may be used to adjust adapters. Adapter inserts (optional) are used to provide more clearance on some vehicles with independent front suspension.
- D. Adjust rear adapter for picking up by the rear axle, slide adapters to vehicle manufacturer's suggested lift points.

Before attempting to lift vehicles, be sure that:

- WARNING**
- A. Vehicle individual axle weight does not exceed one-half lift capacity.
 - B. Adapters are in secure contact with vehicle manufacturer's recommended lift points.
 - C. Adequate overhead clearance is provided to raise vehicle to desired height.

6. To Raise Lift:

Electric/Hydraulic:

- A. Start power unit by depressing "UP" on Reversing Motor Starter.
- B. Depress the "REAR" button located in control box, Fig. 21. Raise rear jack out of the housing. Stop with adapter just below rear axle, by releasing button.

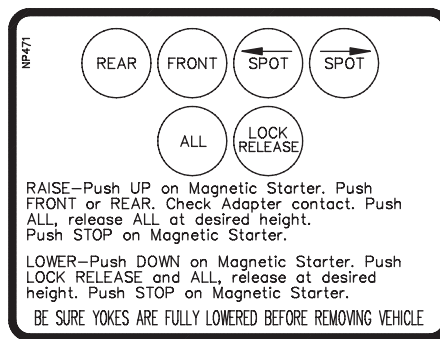


Fig. 21

- C. Depress "FRONT" button. Raise front jack and stop the adapter just below making contact with vehicle, by releasing button, Fig. 21.
- D. Check both front and rear adapters for lifting point alignment. Adjust adapters as required.
- E. Raise vehicle until tires clear the floor by depressing "ALL", Fig. 21.

Check Adapter Contact: Stop and check adapters for secure contact at vehicle manufacturer's recommended lift points.

- IMPORTANT**
- F. Continue to raise vehicle to desired height. Always watch vehicle. Maintain level front to rear while raising.
 - G. Do Not go under vehicle unless all four adapters are in secure contact at vehicle manufacturer's recommended lift points and the locking latches are engaged.
 - H. Lower lift and repeat vehicle spotting and loading procedure if required.
 - I. Turn off power unit by depressing "STOP" at motor starter.

7. Locking Latches:

- A. The air-operated multi-position remote release locking latches are designed (spring actuated) to engage at 3" increments.
- B. Do Not block the latches open or otherwise override this feature.

8. While Using Lift: Avoid excessive rocking of vehicle while on lift.

9. Before Lowering Lift: Remove tool trays, safety stands, etc. from area.

Note: If lift has been lowered onto locking latches, it is necessary to raise lift off locking latches (repeat raise procedure) before attempting to lower lift.

10. To Lower Lift:

A. Start power unit by depressing "Down" on Reversing Motor Starter.

B. Depress the "Lock Release" button to disengage the locking latches, Fig. 21.

Note: Do Not release "Lock Release" until lift has reached the desired lowered position.

C. While depressing "Lock Release", depress "All" and

lower lift. Always watch vehicle. Maintain level front to rear while lowering.

D. Remain clear of lift and vehicle when lowering. Observe pinch point WARNING decals.

E. Lower both jacks until front jack has come to rest on the floor and the rear jack has completely recessed into its housing.

F. Turn off power unit by depressing "STOP" at motor starter.

G. Slide front adapters in to provide an unobstructed exit before removing vehicle from lift area.

11. If lift is not operating properly, Do Not use until adjustment or repairs are made by qualified lift service personnel.

MAINTENANCE INSTRUCTIONS

If you are not completely familiar with automotive lift maintenance procedures **STOP:** contact

WARNING

factory for instructions. Permit only qualified personnel to perform maintenance on this equipment.

- **Never:** Run the power unit motor continuously. If the magnetic starter is not equipped with a timer, Be Sure to manually shut the system down by pushing the "STOP" on the electrical control panel.
- **Never:** Strike plunger with tools. Sharp edges may result in seal damage. If leak occurs, inspect plunger for sharp edges and sand smooth with fine emery paper before replacing seal.
- **Always:** Keep all packing gland bolts tight, torque to 150 ft-lbs. If lost, replace with Grade 8 cap screws. The Rotary seal is self adjusting. There should be a thin film of fluid on plungers for proper operation.
- **Always:** Keep all bolts tight.
- **Always:** Keep lift area, superstructure and trenches clean and free of tools, debris, grease, etc.
- **Always:** Keep motor mounting bolts tight.
- **Daily:** Drain air compressor tank to eliminate accumulation of water. (Do not rely on automatic drain.) Excessive water is harmful to lift system.
- **Monthly:** Lubricate carriage rollers, housing door hinges, chains, and sprockets.
- **Monthly:** Lubricate the pivot pins on the latch release air cylinders and locking latches.
- **Monthly:** Check adapters for distortion, broken parts, etc., replace as needed.

- **Monthly:** Check and keep superstructure to jack attachment bolts tight. Maintain 150 ft.-lbs. torque.
- **Monthly:** Check and keep locking latch strut to superstructure bolts tight. Maintain 150 ft.-lbs. torque.
- **Monthly:** Check fluid seals at each jack and control valve stems for leakage. Replace as required with genuine Rotary replacement parts.
- **Quarterly:** Check all hoses, pipes and fittings for leaks, damage or deterioration.
- **Quarterly:** Lubricate roller chain and trench chain with a good grade of chain lube. Check for proper tension.
- **Quarterly:** Check and keep roller channel clean of debris.
- **Quarterly:** Check fluid level in power unit at least once quarterly or as indicated by lift performance. Should jacks stop short of full rise or the power unit start to squeal, this is an indication the system may be low of fluid.

IMPORTANT

Do not mix or add "Hydraulic Oil" with Bio-Fluid.

IMPORTANT

Should you find the hydraulic system has lost fluid, it is imperative that the source of the fluid loss be diagnosed and repaired immediately. Federal and state environmental laws prohibits the discharge of contaminants into the subsoil or into sewer drains (without a permit).

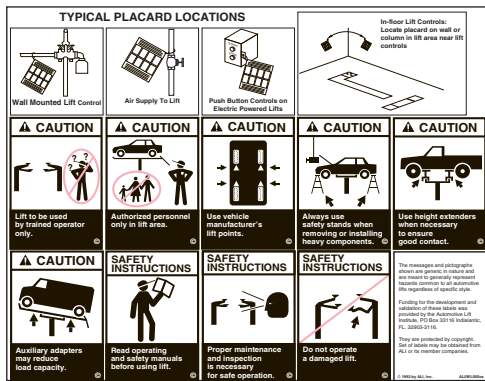
SAFETY WARNING LABELS FOR INGROUND LIFTS

Lift Owner/User Responsibilities:

- A. This Safety Warning placard SHALL be displayed in a conspicuous location in the lift area.
- B. Use one of the mounting arrangements illustrated on back of this placard.
- C. These Safety Warning labels supplement other documents supplied with the lift.
- D. Be certain all lift operators read and understand these labels, operating instructions and other safety related information supplied with the lift.

The following pictograph placard should be located, as shown by Fig. 24, 25, 26 & 27.

Typical Placard Locations



Wall Mounted Lift Controls

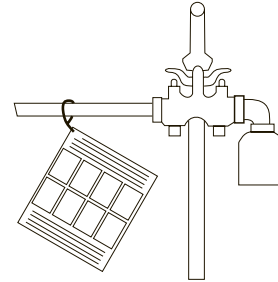


Fig. 24

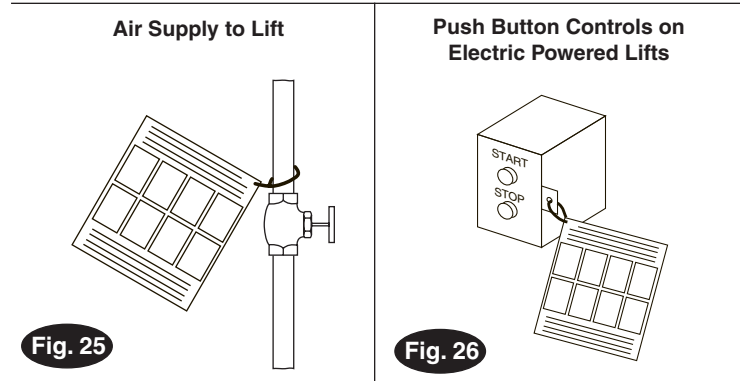


Fig. 25

Fig. 26

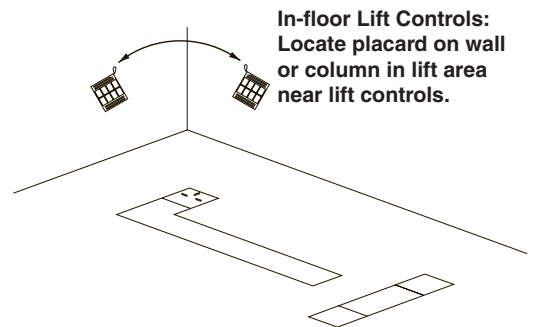


Fig. 27

Installer: Please return this booklet to literature package and give to lift owner/operator.

Trained Operators and Regular Maintenance Ensures Satisfactory Performance of Your Rotary Lift.

Contact Your Nearest Authorized Rotary Parts Distributor for Genuine Rotary Replacement Parts. See Literature Package for Parts Breakdown.

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1 **SECTION 021111 – SOILS REPORT**

2

3 Information regarding subsurface investigation and geotechnical recommendations are included to
4 inform the Contractor of the subsoil conditions. See a copy of the report following this page of the
5 specification section.

6

7 GME Testing
8 Subsurface Exploration and Recommendations
9 August 30, 2021

10

11

12

13 **END OF SECTION 021111**



SUBSURFACE EXPLORATION AND RECOMMENDATIONS

PROPOSED TRANSPORTATION CENTER
Centerville Abington Community Schools
Centerville Road
Centerville, Indiana

GME TESTING PROJECT NO.
G21-080843

PREPARED FOR:

Centerville Abington Community Schools
115 W South Street
Centerville, IN 47330
c/o: Moake Park Group, Inc.
Attn: Jeremy Ogle, RA

August 30, 2021



August 30, 2021
G21-080843

Centerville Abington Community Schools
115 W South Street
Centerville, IN 47330
c/o: Moake Park Group, Inc.
Attn: Jeremy Ogle, RA

REF: SUBSURFACE EXPLORATION AND RECOMMENDATIONS
Proposed Transportation Center
Centerville Abington Community Schools
Centerville Road
Centerville, Indiana

Gentlemen:

In compliance with your request and authorization, **GME Testing** is pleased to submit this report of our subsurface exploration and recommendations for the above referenced project. Our work was performed in accordance with our proposal GMEP21-080405 dated August 9, 2021. Authorization to proceed with our services was provided by acceptance of our proposal agreement on August 12, 2021.

1.0 INTRODUCTION

Geotechnical and Materials Engineers, Inc. (dba., **GME Testing**) has performed a geotechnical engineering evaluation at the site of the proposed transportation center project that is planned for construction on Centerville Abington Community Schools campus in Centerville, Indiana. This evaluation consisted of performing eight (8) vertical soil test boreholes, laboratory testing, engineering analysis and preparation of this report.

2.0 PROJECT COORDINATION

GME Testing coordinated their field work logistics, site access, utilities markings and our geotechnical drilling program schedule with a representative of Centerville Abington Community Schools in collaboration with Moake Park Group, Inc. to complete this geotechnical engineering investigation.

3.0 PURPOSE OF WORK

The general purpose of this evaluation was to develop geotechnical recommendations for the foundations, slab, pavement, and pond design for this project. Our scope of services included:

- Performing eight (8) small diameter, vertical soil test boreholes to observe the subsurface conditions at their respective locations;
 - Evaluating the physical properties of the soils by performing field and laboratory tests;
 - Summarizing the results of the subsurface exploratory program;
 - Analyzing the data from the field and laboratory tests to provide geotechnical recommendations; and
 - Preparing this engineering report that contains information on the subsurface conditions, conclusions and recommendations regarding:
 - a) Geotechnical Considerations;
 - b) Foundations Design Recommendations;
 - c) Ground-Supported Slabs;
 - d) Pavement Subgrade and Design Considerations;
 - e) Detention Pond and Hydraulic Conductivity; and
 - f) General Earthwork Recommendations.
-

4.0 SITE CONDITIONS AND PROJECT DESCRIPTION

4.1 Site Conditions

At the time of our field exploration, a single-story wood-frame building, and concrete basketball courts occupied the northwest portion of the site. The existing building and courts are anticipated to be razed and removed prior to the onset of construction. The rest of the site is relatively level and grass covered. It should be noted that construction materials including, old fill mounds, steel trusses, a tank, equipment, etc. were observed on site to the west and south of the existing building and on the basketball courts. The site is bordered by school driveways to the north and south, a football field with associated parking to the west, and Centerville Road to the east.

The surrounding areas are generally well-developed with several residential buildings, along with overhead and below-ground utilities.

The above description of site conditions is derived from our field investigation and our review of publicly available geologic and topographic maps.

4.2 Project Description

Although a plan and details were not available at this time, it is our understanding that Centerville Abington Community Schools and Moake Park Group, Inc. are developing plans to design and construct a transportation center. This center is to include a pre-engineered metal building, parking for the school corporations bus fleet, and a detention pond.

It is anticipated that the proposed building will be ground supported (i.e., no basement).

The civil and structural design of the proposed site and building will be prepared by others. Traffic criteria were not available at this submittal. However, it is anticipated that the proposed new parking lot will experience mostly bus and possibly infrequent vehicular traffic (of unknown magnitude).

Also, the size, exact location and depth of the proposed detention pond on site was not known at this time. For the purposes of this report, it is assumed that the bottom of the pond will be established at a depth of approximately 7 to 8-feet or less.

If new storm sewer and/or inlets are planned, it is anticipated that they will be constructed by conventional open-trench and backfill methods following applicable OSHA standards.

4.3 Existing Ground Elevations

Based on Beacon website, the existing surface site elevations vary from approximately El. 998 to El. 1006. Finished floor elevation for the proposed building is unknown but anticipated to match that of the existing building. Therefore, little grade change within the proposed building area is anticipated at this time. We recommend that GME Testing be allowed to review grading plans once they become available.

All depths and elevations referred to in this report are referenced from the ground surface existing at the time of this report.

4.4 Structural Loadings

No structural loading information for the proposed construction was available at this writing. For the purposes of this report, it is anticipated that generally moderate structural loadings may occur, pending on evaluation of detailed information of final design when becomes available.

GME Testing should be contacted to review design information that conflicts with our stated understanding of the project.

5.0 SUBSURFACE CONDITIONS

Our field exploration consisted of performing eight (8) vertical test borings (i.e., three building borings, B-1 through B-3, and five parking and detention borings,

B-4 through B-8) at the proposed site. The test borings were drilled to depths ranging from 10 to 20-feet below the existing ground surface as shown on the Borehole Logs, included in Appendix B of this report.

The planned locations of the test borings were established in the field by GME Testing. The site plan provided to us by Moake Park Group, Inc. was projected onto aerials provided by the Google Earth website allowing for the correlation of the approximate latitude and longitude coordinates with each boring location. These coordinates were then assigned as waypoints and uploaded into a handheld GPS unit. Utilizing the handheld GPS unit, the locations referred to on our boring logs and presented on Figure 1, included in Appendix A of this report. Additional details of field exploration, laboratory testing and geologic conditions are provided in Appendix A of this report.

The lines of demarcation shown on the logs represent approximate boundaries between the various classifications. The stratification of soils, as shown on the accompanying test borehole logs, represents the soil conditions at the drilled borehole locations, and variations may occur between the boreholes. In-situ strata changes could occur gradually or at different levels. Also, it should be noted that the boreholes depict conditions at the particular locations and times indicated.

5.1 Generalized Soil Profile

Building (B-1 through B-3)

Approximately 12 and 30-inches of sandy topsoil were disclosed in borings B-1 and B-2, respectively. In boring B-3, 12-inches of fill materials consisting of sand and gravel were disclosed.

The native soils below consisted of sandy clays, sandy silty clays, and clayey silty sands. The consistencies of the clays ranged from medium stiff to stiff to a depth of approximately 8-feet. Below 8-feet, the consistencies of the clays improved and were very stiff to hard. However, in borings B-2 and B-6 below depths of about 3-feet interbedded soft clayey soils were disclosed. The sands

relative densities ranged between loose to medium dense changing to very dense below a depth of about 18-feet in borings.

Parking and Detention (B-4 through B-8)

Approximately 2 to 12-inches of clayey and silty sandy topsoil were disclosed in borings B-4, B-5, B-7, and B-8. The topsoil was not apparent in boring B-6.

The cohesive soils disclosed beneath the surficial materials consisted of brown and gray, silty sandy clay soils of medium stiff over very stiff to hard consistencies. Additionally, cohesionless soils were also disclosed and consisted of loose brown clayey silty sands, and medium dense to very dense medium coarse sands and gravels.

Depending on the time of the year earthwork activities will take place, any existing soils that exhibit moisture content above optimum moisture will need to be mitigated by drying and aerating if they cannot be adequately compacted to desired density. Alternately, removal and replacement may be necessary if these soils cannot be dried naturally.

The consistencies and relative densities of the encountered soils were based on the Standard Penetration Test, N-values, according to ASTM D-1586.

The foregoing discussions of subsurface conditions on this site represent generalized soil profiles at the test boring locations. A more detailed description and data for each test boring can be found on the individual Borehole Logs in Appendix B of this report.

5.2 Groundwater Conditions

Groundwater measurements were taken during our field operations by noting the depth of water on the rods and in open boreholes following withdrawal of the drilling augers after the completion of drilling activities in test borings. Free groundwater was encountered during and following our drilling program in the borings at depths of approximately 8 to 20-feet in building borings and at 5 to 7-

feet in pavement and detention borings. Table 1 below summarizes groundwater depths at the various borings as shown on the boring logs, included in Appendix B of this report.

Table 1: Groundwater Depths in the Borings at Time of Drilling

Boring No.	*Groundwater Depth, ft	
	During Drilling	Immediately After Drilling
B-1	±8.5	±8.5
B-2	±20	±14
B-3	±10	±14
B-4	±7.5	±7.5
B-5	±5	±5
B-6	±7.5	±7.5
B-7	±7.5	±5
B-8	±5	±5

**Depths referenced below existing ground surface.*

The groundwater depths shown on the boring logs reflect groundwater levels only for the date which the borings were drilled.

It must be noted, however, that short term groundwater level observations made in test borings are not necessarily a reliable indication of the actual groundwater elevation. Fluctuations in the level of groundwater typically occur due to variations in rainfall, water level and other factors. Shallow trapped water may become evident during wet periods of the year, within interbedded sands, soft clays and loose granular soils.

6.0 EVALUATION AND RECOMMENDATIONS

The following design recommendations have been developed to assist the designers in preparing the foundation design and development plans for the proposed project. If any substantial changes in the proposed construction, scope, location, loads, or assumed grades should be brought to our attention so that we may evaluate how such changes may affect our conclusions and recommendations. Based on the test borings information and our understanding

of the foundation types considered for design, our geotechnical recommendations for the design of foundations for the planned construction areas are provided in the subsequent sections of this report.

6.1 Geotechnical Considerations

The project plans and specifications may call for demolition of existing building, removal of existing fill mounds, pavement and any old construction. After all existing construction elements are removed below the proposed construction areas, GME Testing recommends that the resulting grades be evaluated prior to placing any new grade raise fill. Any remnants of old construction and unsuitable materials should be removed and engineered fill materials, if required, can be placed on approved subgrade and compacted to desired densities provided in this report.

Extending foundation walls and columns below existing soft and/or compressible soils similar to those found in borings B-2 and B-3 should be anticipated.

The existing clayey sands encountered in the borings B-1 through B-3 to varying depths will become unstable if moisture content approaches near or above optimum moisture content as determined by ASTM D-1557.

6.2 Foundations Design Recommendations

The structural design of the foundation element will be the responsibility of others. However, the following minimum design recommendations are offered. Note, seismic site class "D" may be used for this project, and additional details of seismicity are provided in Appendix A of this report.

Removal and/or mitigation of existing subgrade and underlying compressible soils at test boring locations B-2 and B-3 will be needed. After the existing building is razed and all buried construction elements are properly removed, the resulting grade must be evaluated. Test pits may be needed at time of construction.

Provided that all unsuitable materials are properly removed, and the subgrade is satisfactory proofrolled before and after filling, the proposed building can be supported on conventional footings. Such footings must bear on approved properly compacted engineered fill and/or approved, firm native soils.

Conventional footings supported as recommended above should be proportioned for a maximum net allowable soil bearing pressure of **2,000 pounds per square foot (psf)** for column (square type) and **1,500 psf** for strip (wall type) footings. If significant changes are evident, modifications to our recommendations may be warranted. All footings should be designed by a qualified professional structural engineer.

Provided that the foundations are properly installed, and all unsuitable materials are removed below all footings, total foundation settlements are not expected to exceed about one (1) inch with differential settlements of one and one half (1½) inch. Field control and proper footing proportions will contribute substantially to minimizing total and differential settlements.

All footings should be designed by a qualified professional structural engineer for maximum required loads. Any footings that are excavated should be properly protected from disturbance and inclement weather.

In using net pressures, the weight of the footing and backfill over the footing including the weight of the floor slab need not be considered. Hence, only loads applied at or above the finished floor need to be used for dimensioning the footings.

It is essential that the soil below, above, and surrounding the footing consist of approved material, placed and compacted in accordance with this report.

Under no circumstance should footings bear on soft, wet, organic-containing materials or otherwise unsuitable compressible soils. A suitable hand penetration device (e.g., DCP or other approved method) should be used to check that the bearing soils at the base of the footings are consistent with the recommendations

provided in this report. **We strongly recommend that GME Testing be retained to check the foundation bearing soils for consistency with the conditions observed in our test boring, as well as other earthwork related matters during construction.**

All footings should be suitably reinforced and installed as discussed in **Foundation Excavations and Monitoring**, Section 7.4 of this report and as called for on project plans and specifications.

Positive drainage of surface water, including downspout discharge, should be maintained away from structure foundations to avoid wetting and weakening of the foundation soils both during construction and after construction is complete. Water must not be allowed to pond on or adjacent to the structures. If any water infiltration will be encountered in the footing excavations, it should be removed by adequate sumps placed outside the limits of the main footing excavations. Dewatering, if required, will be the responsibility of the contractor.

6.3 Ground-Supported Slabs

After the existing structure is removed, the new building slab subgrade will need to be comprehensively evaluated by proofrolling and testing until no yielding or pumping is observed. Existing utility corridors should be suitably backfilled as called for in the project plans and specifications.

If pumping and yielding is observed, the unsuitable materials should be either undercut and replaced with new compacted engineered fill or aerated and conditioned then compacted to 95 percent as evaluated by ASTM D-1557.

It is recommended that GME Testing be present on site to evaluate the subgrade. The slab subgrade should be prepared in accordance with the **Site Preparation**, Section 7.1 of this report and applicable project specifications. The floor slabs should be designed by a qualified structural engineer for the anticipated loadings.

Provided the subgrade areas are prepared in accordance with our recommendations, we recommend using 6 or more inches of free-draining granular material. Suitable clean, free-draining soil should contain 5 to 10 percent fines, by weight, passing the No. 200 U.S. Standard sieve (i.e., sand and gravel and/or INDOT No. 53 limestone). Utilizing the aggregate layer between the slabs will provide improved stability and greater protection of the subgrade. The thickness of aggregate needed to provide a stable construction platform at the exposed subgrade elevation will depend on the condition of the subgrade during construction and the type and volume of construction equipment expected to traffic the prepared subgrade. The above is a minimum stone thickness and may be increased under concentrated loaded areas (if required) and/or to replace any unsuitable soils on site.

Special attention should be made to the placement of backfill against the building foundations and walls as inadequate compaction of these locations may cause cracking of the slab edges and corners due to subsidence of the backfill.

Isolation joints should be provided at the junctions of the slab and foundation system so that a small amount of independent movement can occur without causing damage.

Depending on the choice of floor finishes, it may be appropriate to incorporate a moisture barrier below the floor slab. This decision should be evaluated by the architect and structural engineer based on the intended floor usage, planned finishes, and in accordance with ACI recommendations.

We recommend the slab-on-grade subgrade soils be protected from frost during winter construction. Frozen soils must be thawed and compacted or removed and replaced prior to slab-on-grade construction.

6.4 Pavement Subgrade and Design Considerations

Based on the subgrade conditions in borings B-4 through B-8, it is our opinion that the pavement design will be controlled by the existing cohesive soils.

The proposed pavement subgrade should be prepared as discussed in **Site Preparation**, Section 7.1 of this report. The installation of new pavement surfaces should be in accordance with project plans and specifications. We anticipate that the design pavement thicknesses will be determined by others and some modifications to the recommendations presented in this report may be needed at time of construction. Please note that all pavements require regular maintenance and repair due to the normal wear and tear.

Based on test borings, pavement established within soils similar to those disclosed near the surface in borings B-5 through B-8 may require improvement. Depending on weather condition and final grading plans, the existing clays that are pumping and yielding will require reworking until desired moisture and compaction results are achieved. Any areas that cannot be mitigated naturally should be replaced with engineered fill after evaluation by GME Testing geotechnical engineer or designee. To reduce construction difficulties below proposed pavement, final pavement subgrade should be established near or above the existing ground surface elevation.

All new fill materials supporting pavements must be compacted to achieve a dry density of 95 or more percent as evaluated by ASTM D-1557.

If it becomes necessary to chemically stabilize the subgrade, specialty contractor should determine the dosage, product, and thickness of stabilization. Based on our past experience, the chemically treated lift thickness should not be less than 14-inches.

For localized unsuitable areas, mitigation by placing large size limestone aggregate (e.g., INDOT No. 1 or 2) and choked with crushed 53 limestone can be used. However, to reduce undercutting in certain area that experience subgrade movement may require to place above stone over geogrid such as BX 1200 or 1300. For this reason, the designer may include an undistributed quantity of additional stone and geogrids to mitigate areas of the subgrade that may require stabilization similar to those found in borings B-5 through B-8. Other

approved geotextile products (i.e., Mirafi®) can also be used as specified on the plans or directed by the engineer.

A California Bearing Ratio (CBR) value of approximately 2 percent may be used for design of the proposed pavement section based on correlation obtained from our field and laboratory testing, provided that the subgrade is properly prepared and new fill is compacted as recommended in this report.

6.4.1 Pavement Drainage

Water infiltration into pavement subgrade soils can reduce the service life of the pavement. Therefore, we recommend that adequate surface drainage be provided at the site to minimize any increase in moisture content of the pavement soils. The subgrade surface should be uniformly sloped to facilitate drainage through the granular base to the shoulders or inlets and to avoid any ponding of water beneath the pavement.

During wet weather periods, increase in the moisture content of the soils can cause significant reduction in the soil strength and support capabilities. It will, therefore, be advantageous to accomplish earthwork and site preparation activities during typical seasonally dry times of the year with little to no rain fall.

6.5 Detention Pond and Hydraulic Conductivity

We understand that a detention pond will be constructed at the proposed project site. As previously mentioned, the exact location and depth of the detention pond on site was not known at this writing. Assuming that the proposed pond will be established and excavated in boring area for example B-7 or B-8 at depths of approximately 7 to 8 feet, cohesive and non-cohesive soils will likely be encountered.

Infiltration

Based on our past experience with similar soils and according to correlations established by Coduto, permeability coefficients of the various materials disclosed in our boring are presented in Table 2.

Table 2: Summary of Approximate Permeability Coefficients

Soil Classification/Description	Approximate (Un-factored) Permeability (cm/sec.)
Sandy Silty Clay (CL)	1×10^{-7} - 1×10^{-5}
Clayey Silty Sand (SM)	1×10^{-4} - 1×10^{-2}

Please note that the result provided is raw data that may be subject to modification by the engineer, and in accordance with accepted design procedures. The rates provided in Table 2 are un-factored and approximate. Given these factors and the high degree of variability, a conservative approach is recommended.

Based on the results of the subsurface evaluation of the borings, existing cohesive soils such as silty sandy clays will allow for water to seep into them at a relatively slow rate. While the existing cohesionless soils encountered in borings will allow for water to seep through them at a high rate.

If the existing granular soils are encountered at the exact bottom of the pond, a natural or synthetic clay liner should be incorporated into the design of the pond bottom and sides to allow for water seepage to flow through the soils at a low rate.

The clay liner should be tested and approved by the engineer prior to transporting on site and should exhibit a "CL" soil classification based on the Unified Soil Classifications System, according to ASTM D-2487. This clay should have a plasticity index of approximately between 15 and 30 percent according to ASTM D-4318.

Whenever groundwater is encountered during construction, measures should be taken to permit the construction to be completed in relatively dry conditions. The proper dewatering system must be determined by the contractor at the time of construction based upon field conditions.

We recommend that the slopes should be no steeper than 3(horizontal) to 1(vertical) [3(h):1(v)]. It should be noted that slope stability analysis for the proposed retention pond was beyond the scope of this investigation and will be the responsibility of others.

We recommend grass cover over the slopes to provide a suitable erosion protection system provided the root systems can sustain the peak velocities from the rainwater. Periodic observation of slopes should be planned to identify areas that may require a more positive erosion protection system or maintenance.

GME Testing should evaluate the pond materials are adequate after the proposed pond is excavated to desired depth. All new fill should be placed and compacted in accordance with the recommendations of this report.

7.0 GENERAL EARTHWORK RECOMMENDATIONS

7.1 Site Preparation

Based on the test boring logs, the topsoil was observed to be approximately 2 to 30-inches in thickness. However, the thickness of the surficial conditions will vary.

The following site preparation recommendations are provided to assist in preparing for the proposed project:

- Demolishing existing building and removing all construction debris;
 - Razing existing concrete basketball courts;
 - Removing topsoil and any organic-laden materials;
 - Proofrolling the subgrade after desired grades are established;
 - Aerating and conditioning existing soils exhibiting moisture contents greater than approximately 2 percent of the optimum moisture content determined by approved Proctor value per ASTM procedure;
 - Evaluating all excessively yielding, pumping and unsuitable subgrade;
 - Stabilizing existing very moist, yielding and pumping near surface soils;
 - Relocating existing buried utilities (if any present) as called for on plans;
-

- Backfilling all utility corridors (if included) with approved suitable materials; and
- Compacting new engineered fill materials to desired densities in this report.

The purpose of the proofrolling is to detect soft, yielding, or unstable areas under the influence of construction traffic. GME Testing should be retained to evaluate the exposed subgrade.

Depending on the final grading plans and the time of the year earthwork is expected to commence, the appropriate mitigation methods discussed above and encountered during site preparation program will be determined.

During wet weather periods, increase in the moisture content of the soils can cause significant reduction in the soil strength and support capabilities. It will, therefore, be advantageous to accomplish earthwork and site preparation activities during typical seasonally dry times of the year with little to no rain fall.

If any excavations are expected to be excavated near or below groundwater in borings, the wet sandy soils are expected to become “quick-acting” and significant groundwater related difficulties will be encountered; therefore, this should be avoided, if at all possible.

Repeated heavy construction traffic could cause the subgrade to pump, yield, and weak areas to develop and therefore should be avoided. Heavy construction traffic should use designated areas as directed by contractor.

The foregoing recommendations for earthwork and site preparation were developed based on our understanding of the project and the site conditions as interpreted in our field investigation. All earthwork and site preparation should be performed under the observation of the geotechnical engineers’ field representative. Additionally, the earthwork recommendations may require modifications based on the field observations during construction. The

appropriate course of action should be determined by the geotechnical engineer at the time of construction.

7.2 Engineered Fill

7.2.1 Fill Compaction Specifications

All engineered fill needed to replace undercut materials or as a grade-raise fill should be approved by GME Testing prior to placement on site and should be compacted to 95 or more percent of the modified Proctor maximum dry density (ASTM D-1557).

The fill should be placed in lifts of uniform thickness. Engineered fill should be placed in lifts no greater than 8-inches thick (loose). Structural fill supporting footings and placed over footings should be compacted to 95 or more percent of the maximum modified Proctor dry density in accordance with ASTM D-1557.

7.2.2 Fill Materials

Engineered fill material must be free of significant organic matter or debris, must not contain rocks or hard lumps greater than 3-inches, and should have a low to moderate plasticity. For cohesive soils, the maximum liquid limit (ASTM D-423) and plasticity index (ASTM D-424) shall be of 30 and 10 percent, respectively.

All fill materials must be tested and approved by a qualified geotechnical laboratory prior to placement. If the fill is to provide non-frost susceptible characteristics, it must be classified as a clean (i.e., with a maximum of 10 percent passing No. 200 standard US sieve) “GW”, “GP”, “SW” or “SP” per the Unified Soil Classification System (ASTM D-2487).

7.2.3 Fill Placement Procedures

Engineered fill must be placed on a prepared subgrade that has been evaluated by a geotechnical engineer as discussed in Site Preparation Section 7.1. The evaluation must include proofrolling of the exposed subgrade surface.

Compaction must be accomplished by placing the fill in lifts and mechanically compacting each lift to the above specified dry density. The maximum lift thickness depends upon the soil type, moisture content, specified compaction, and compaction equipment. In general, the thickness of about 6-inches and 10-inches should be used for clay soils and granular soils, respectively.

If clayey soils are used for fill, some modification of the moisture content (either through aeration in wet periods or adding water in dry periods) may be necessary.

7.3 Excavations and Trenches

All excavating and trenching operations should comply with the requirements of OSHA 29CFR, Part 1926, Subpart P, "Excavations", which deals with excavation and trench safety. Trenches and excavation for utilities and other construction activities are subject to caving sides and can expose workers to engulfment hazards. All excavations should be monitored by a "Competent Person", as defined by the OSHA standard, and appropriate shoring or sloping techniques used to prevent cave-ins.

If storm sewer is planned, trench excavation width and preparation should be according to the project plans and standard specifications or as deemed necessary by the engineer.

All current federal, state and local safety requirements should be followed in planning and maintaining excavations. Temporary excavations should be constructed in accordance with OSHA guidelines.

7.4 Foundation Excavations and Monitoring

Each foundation excavation should be evaluated by GME Testing to check that all unsuitable materials are removed, and that the foundation will bear on satisfactory material before forming and/or placing steel or concrete.

Concrete strength and consistency tests should also be carried out, in accordance with the project specifications.

Wherever unsuitable materials are encountered, undercutting and/or over-excavation will be required below footing excavations. The footings may be extended through unsuitable soils, soft, weak, or organic-containing materials to firm natural soils below or constructed on engineered fill placed in the undercut sized as shown in Figure 2, included in Appendix A. Alternately, lean concrete (i.e., 2,000 or more psi mix) may be used to replace unsuitable materials below footing excavations to limit lateral undercut and expedite construction activities.

If possible, all concrete for foundations should be poured the same day as the bearing surfaces are approved. If this is not practical, the foundation excavation should be adequately protected. Soils exposed in the bases of all excavations must be protected against any detrimental change in conditions such as from disturbance, rain, and freezing. Surface run-off water must be drained away and not allowed to pond in the excavations.

7.5 Groundwater Control

No significant groundwater related difficulties are anticipated for any excavations made above groundwater levels in borings. If minor water infiltration is experienced, conventional dewatering procedures should generally be sufficient. The appropriate dewatering system for each case must be determined by the contractor at the time of construction based upon actual field conditions.

When designing site drainage patterns, site runoff should be diverted away from the foundations and directed to on-site retention areas or storm sewer systems. It is anticipated that these measures can reduce the potential for softening and possible erosion of the foundation subgrade soils. It is necessary that water is not permitted to pond near the building areas and foundations.

8.0 LIMITATIONS

This field evaluation, laboratory testing, and geotechnical analyses presented in this geotechnical report have been conducted in general accordance with current practice and the standard of care exercised by geotechnical consultants performing similar tasks in the project area. No other warranty, expressed or implied, is made regarding the conclusions, recommendations, and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be encountered during construction. Additional subsurface evaluation will be performed upon request.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. GME Testing should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document.

Our geotechnical recommendations and opinions are based on an analysis of the observed site conditions. If geotechnical conditions different from those described in this report are encountered, our office should be notified and additional recommendations, if warranted, will be provided upon request.

Although general constructability issues have been considered in this report, the means, methods, techniques, sequences and operations of construction, safety precautions, and all items incidental thereto and consequences of, are the responsibility of parties to the Project other than GME Testing. This office should be contacted if additional guidance is needed in these matters.

The scope of our services does not include any environmental assessments or investigations for the possible presence of toxic materials in the soil, groundwater or surface water within or in the general vicinity of the site studied. Any statements made in this report or shown on the test borehole logs regarding unusual subsurface conditions and/or composition, odor, staining, origin or other

characteristics of the surface and/or subsurface materials are strictly for the information of our client.

We wish to remind you that we will store the samples for 30 days after which time they will be discarded unless you request otherwise.

We appreciate the opportunity to be of service on this project. Should you have any questions related to this report, please contact us at your convenience.

Sincerely,
GME Testing



Ramy M. Anabtawi, P.E., D.GE
Principal Engineer



Abby Laudenschlager
Staff Engineer

APPENDIX A

FIELD EXPLORATION

Drilling and Sampling Procedures

The test borings were drilled using conventional augers to advance the holes and representative samples of the soils were obtained employing split-barrel sampling techniques in accordance with ASTM procedures D-1586-84. After completion of the borings and water level readings, the auger holes were backfilled with auger cuttings.

The description and depths of soil strata encountered and levels at which samples were recovered are indicated on the accompanying borehole log sheets in the Appendix B. In the column "Soil/Material Description" on the drill borehole log, the horizontal lines represent stratum changes. A solid line represents an observed change, and a dashed line represents an estimated change. An explanation of the symbols and terms used on the boring log sheets is given in Appendix B of this report.

Field Tests and Measurements

Standard Penetration Test: During the sampling procedures, Standard Penetration Test (SPT) was performed at regular intervals through the depth of the borings. The SPT value ("N"-value) is defined as the number of blows required to advance a 2-inch O.D., split-barrel sampler a distance of one foot by a 140-pound hammer falling 30-inches. These values provide a useful preliminary indication of the consistency or relative density of most soil deposits and are included on the Borehole Logs in Appendix B.

Water Level Measurements: Groundwater level observations were made in the boring holes during and upon completion of the boring operations. The groundwater level measurements are noted on the boring logs presented herein.

All recovered samples were returned to GME Testing laboratory for visual examination and subsequent laboratory testing.

LABORATORY TESTING

Selected soil samples obtained from the drilling and sampling program were tested in the laboratory to evaluate additional pertinent engineering characteristics of the foundation materials necessary in estimating the engineering properties of these materials.

Soil Laboratory Tests and Measurements

Visual Classification: All samples were visually classified by a geotechnical engineer in general accordance with ASTM D-2488, and on the Borehole Logs, which are located in the Appendix B of this report.

Moisture Content Tests: The natural moisture content of selected samples was determined by ASTM method D-2216 and is recorded on the Borehole Logs as a percentage of dry weight of soil under the “MC”.

Hand Penetration Tests: Samples of cohesive soils obtained from the split spoon sampler were tested with a calibrated hand penetrometer to aid in evaluating the soil strength characteristics. The results from this testing are tabulated on the Borehole Logs under the heading “Q_P”.

Unconfined Compressive Strength Tests: The undrained shear strengths of the cohesive soils were evaluated utilizing unconfined compressive tests on specimens obtained from the split-barrel and/or thin wall tube sampler. The values of strength tests performed on soil samples obtained from the split-barrel sampler are considered approximate recognizing that the sampler provides a representative but somewhat disturbed sample. The test results are tabulated on the Borehole Logs under the heading “Q_u”.

SEISMICITY

The seismic design requirements for buildings and other structures are based on Seismic Design Category. Site Classification is required to determine the Seismic Design Category for a structure. The Site Classification is based on the upper 100-feet of the site profile defined by a weighted average value of either shear

wave velocity, standard penetration resistance, or undrained shear strength in accordance with Section 20.4 of ASCE 7. Seismic report is included in Appendix B of this report.

Description	Value
2012 International Building Code Site Classification (IBC)	D ¹
Site Latitude	39.812782
Site Longitude	-84.997504
S _s	0.141g
S ₁	0.075g
S _{DS}	0.15
S _{D1}	0.12

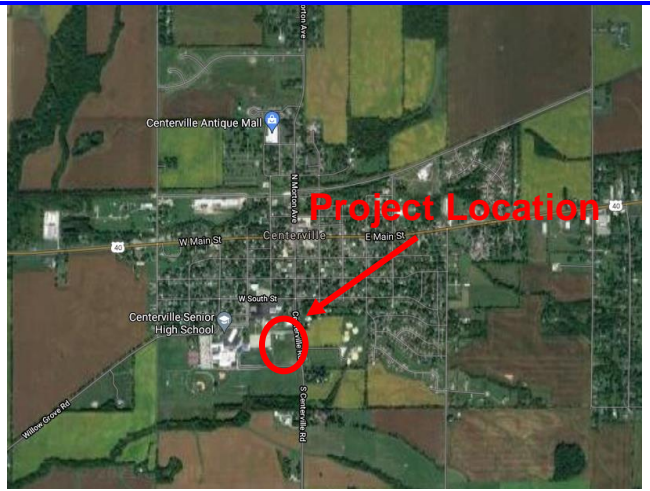
1. The 2012 IBC uses a site profile extending to a depth of 100 feet for seismic site classification. Borings at this site were extended to a maximum depth of 20-feet. The site properties below the boring depth to 100 feet were estimated based on our experience and knowledge of geologic conditions of the general area.

GEOLOGIC CONDITIONS

According to the *United States Department of Agriculture (USDA) Soil Survey and Natural Resources Conservation Service (NRCS)*, the natural soils covering the majority of the site are classified as Crosby silt loam (Southern Ohio Till Plain), and Treaty silty clay loam. A copy of the *Custom Soil Resource Report for Wayne County, Indiana* has been included in Appendix B of this report.



VICINITY MAP (NOT TO SCALE)

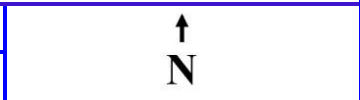


NOTES

1. All boring locations were designated by the client and are approximate.
2. Vicinity map generated using imagery from google.com/maps.

FIGURE 1 – APPROXIMATE BORING LOCATION MAP

Project Name: Proposed Transportation Center
Location: Centerville Road, Centerville, Indiana
Client Name: Centerville Abington Community Schools
C/o: Moake Park Group, Inc.
GME Project Number: G21-080843

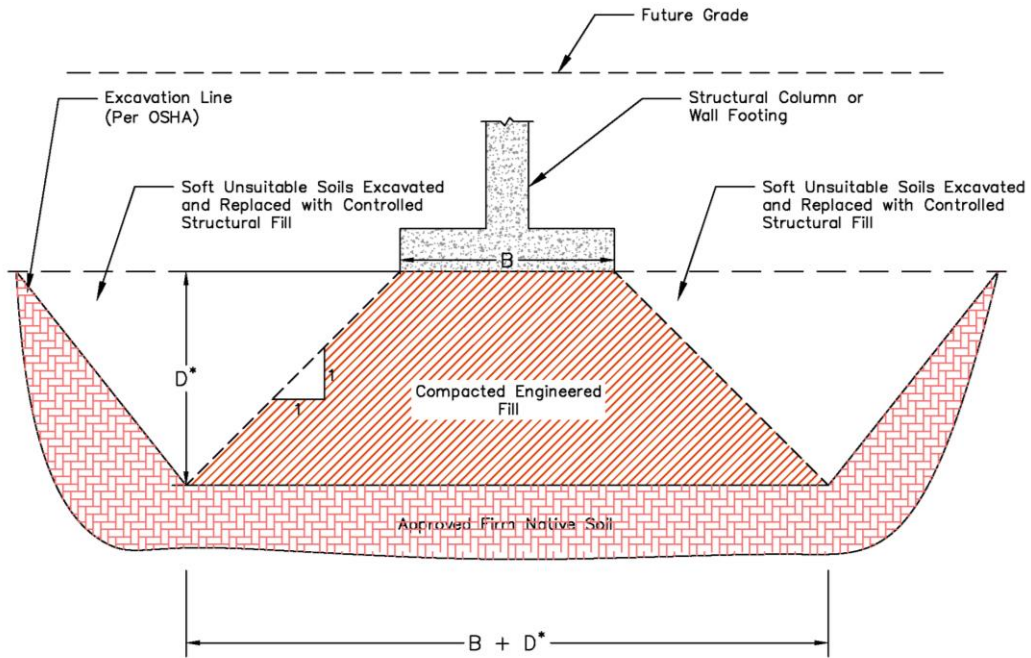


LEGEND

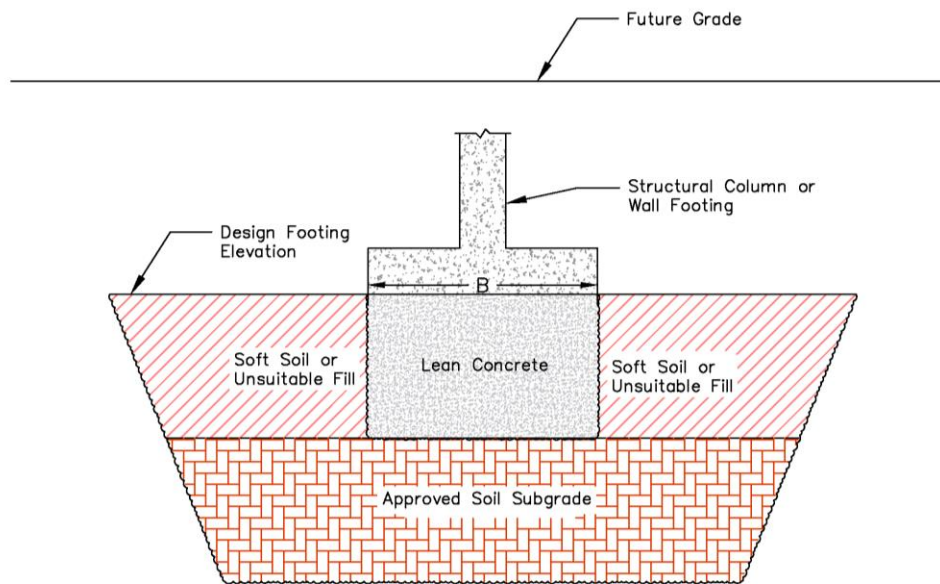
 B-1
 Test Boring Location and Designation



UNDERCUT EXCAVATION FOR FOOTINGS IN UNSTABLE MATERIALS
REPLACED WITH COMPACTED STRUCTURAL FILL



UNDERCUT EXCAVATION FOR FOOTINGS
IN UNSUITABLE MATERIALS REPLACED WITH
LEAN CONCRETE



APPENDIX B

TEST BORING LOG

BORING NO.: **B-01**
 SHEET 1 OF 1
GME PROJECT NO: **G21-080843**
 STRUCTURE _____
 DATUM : _____
 DATE STARTED : 08-18-21
 DRILLER/INSP : DB/JS

CLIENT: Centerville Abington Community Schools, c/o Moake Park Group
 PROJECT TYPE : Proposed Transportation Center
 LOCATION : Centerville Road, Centerville, Indiana

ELEVATION : <u>1005.0</u>	BORING METHOD : <u>ASTM D-1586</u>	LATITUDE : <u>39.812797</u>
STATION : _____	RIG TYPE : <u>ATV</u>	LONGITUDE : <u>-84.997623</u>
OFFSET : _____	CASING DIA. : <u>3.3 in</u>	
LINE : _____	HAMMER : <u>Auto</u>	
DEPTH : <u>20.0 ft</u>		

GROUNDWATER: Encountered at 8.5 ft At completion 8.5 ft Caved in at 8.5 ft

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	SAMPLE NUMBER	SPT per 6" (N)	% RECOVERY	MOISTURE CONTENT	UNCONF. COMP., tsf	Qp (tsf)	REMARKS
1004.0		±12" Dark Brown, Sandy TOPSOIL.							Grass
1002.5	2.5	Dark Brown, Moist, SILTY SANDY CLAY.	SS 1	6-6-5 (11)	100	20.8		2.5	
1000.0	5.0	Brown, Moist, SANDY CLAY.	SS 2	4-5-5 (10)	100	10.0	3.10	2.5	
	7.5		SS 3	5-6-5 (11)	100	11.5			
	10.0	Brown, Very Moist, CLAYEY SILTY SAND, Trace Gravel Wet @ ±8'.	SS 4	6-5-3 (8)	100				
993.0	12.5		SS 5	11-16-19 (35)	100	10.0		4.5+	
987.0	18.0		SS 6	33=6"- ()	100	16.0			
985.0	20.0	Gray, Very Moist, Medium Coarse, SAND and GRAVEL.							
		Bottom of Boring at 20.0 ft							

GENERAL NOTES

SAMPLE IDENTIFICATION

Visual soil classifications are made in general accordance with the United States Soil Classification System on the basis of textural and particle size categorization, and various soil behavior and characteristics. Visual classifications should be made by appropriate laboratory testing when more exact soil identification is required to satisfy specific project applications criteria.

RELATIVE PROPORTIONS OF COHESIONLESS SOILS

<u>Term</u>	<u>Defining Range by % of Weight</u>
Trace	1-10 %
Little	11-20 %
Some	21-35 %
And	36-50 %

WATER LEVEL MEASUREMENT

NE	No Water Encountered
BF	Backfilled upon Completion

ORGANIC CONTENT BY COMBUSTION METHOD

<u>Soil Description</u>	<u>LOI</u>
w/ organic matter	4-15 %
Organic Soil (A-8)	16-30 %
Peat (A-8)	More than 30%

LABORATORY TESTS

Qp	Penetrometer Reading, tsf
Qu	Unconfined Strength, tsf
MC	Moisture Content, %
LL	Liquid Limit, %
PL	Plastic Limit, %
PI	Plastic Index
SL	Shrinkage Limit, %
pH	Measure of Soil Alkalinity/Acidity
γ	Dry Unit Weight, pcf
LOI	Loss of Ignition, %

DRILLING AND SAMPLING SYMBOLS

AS	Auger Sample
BS	Bag Sample
PID	Photo ionization Detector (Hnu meter) volatile vapor level,(PPM)
COA	Clean-Out Auger
CS	Continuous Sampling
FA	Flight Auger
HA	Hand Auger
HAS	Hollow Stem Auger
NR	No Recovery
PT	3" O.D. Piston Tube Sample
RB	Rock Bit
RC	Rock Coring
REC	Recovery
RQD	Rock Quality Designation
RS	Rock Sounding
S	Soil Sounding
SS	2" O.D. Split-Barrel Sample
2ST	2" O.D. Tin-Walled Tube Sample
3ST	3" O.D. Thin-Walled Tube Sample
VS	Vane Shear Test
DB	Diamond Bit
WS	Wash Sample
RB	Roller Bit
ST	Shelby Tube, 2" O.D. or 3" O.D.
CB	Carbide Bit
WOH	Weight of the Hammer

GRAIN SIZE TERMINOLOGY

RELATIVE DENSITY

CONSISTENCY

PLASTICITY

<u>Soil fraction</u>	<u>Particle size</u>	<u>Us standard sieve size</u>	<u>Term</u>	<u>"N" Value</u>	<u>Term</u>	<u>"N" Value</u>	<u>Term</u>	<u>Plastic Index</u>
Boulders	larger than 75 mm	Larger than 3"	Very Loose	0-5	Very Soft	0-3	None to Slight	0-4
Gravel	2mm to 75 mm	#10 to 75 mm	Loose	6-10	Soft	4-5	Slight	5-7
Coarse Sand	0.425 mm to 2 mm	#40 to #10	Medium Dense	11-30	Medium Stiff	6-10	Medium	8-22
Fine Sand	0.075mm to 0.425 mm	#200 to #40	Dense	31-50	Stiff	11-15	High/Very High	Over 22
Silt	0.002 mm to 0.075 mm	Smaller than #200	Very Dense	51+	Very Stiff	16-30		
Clay	Smaller than 0.002 mm	Smaller than #200			Hard	31+		

Note(s):

The penetration resistance, "N" Value, is the summation of the number of blows required to effect two successive 6-inch penetrations of the 2-inch split-barrel sampler. The sampler is driven with a 140-lb. weight falling 30-inches and is seated to a depth of 6-inches before commencing the standard penetration test.

Water level measurements shown on the boring logs represent conditions at the time indicated and may not reflect static levels, especially in cohesive soils

GME TESTING

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GME

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SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		(LITTLE OR NO FINES)		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
		(APPRECIABLE AMOUNT OF FINES)		GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS	CLEAN SANDS		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		(LITTLE OR NO FINES)		SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
SANDS WITH FINES	(APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES	
	(APPRECIABLE AMOUNT OF FINES)		SC	CLAYEY SANDS, SAND - CLAY MIXTURES	
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS



G21-080843- Centerville Abington Transportation Center

Latitude, Longitude: 39.812782, -84.997504



Date	8/26/2021, 11:50:44 AM
Design Code Reference Document	IBC-2012
Risk Category	III
Site Class	D - Stiff Soil

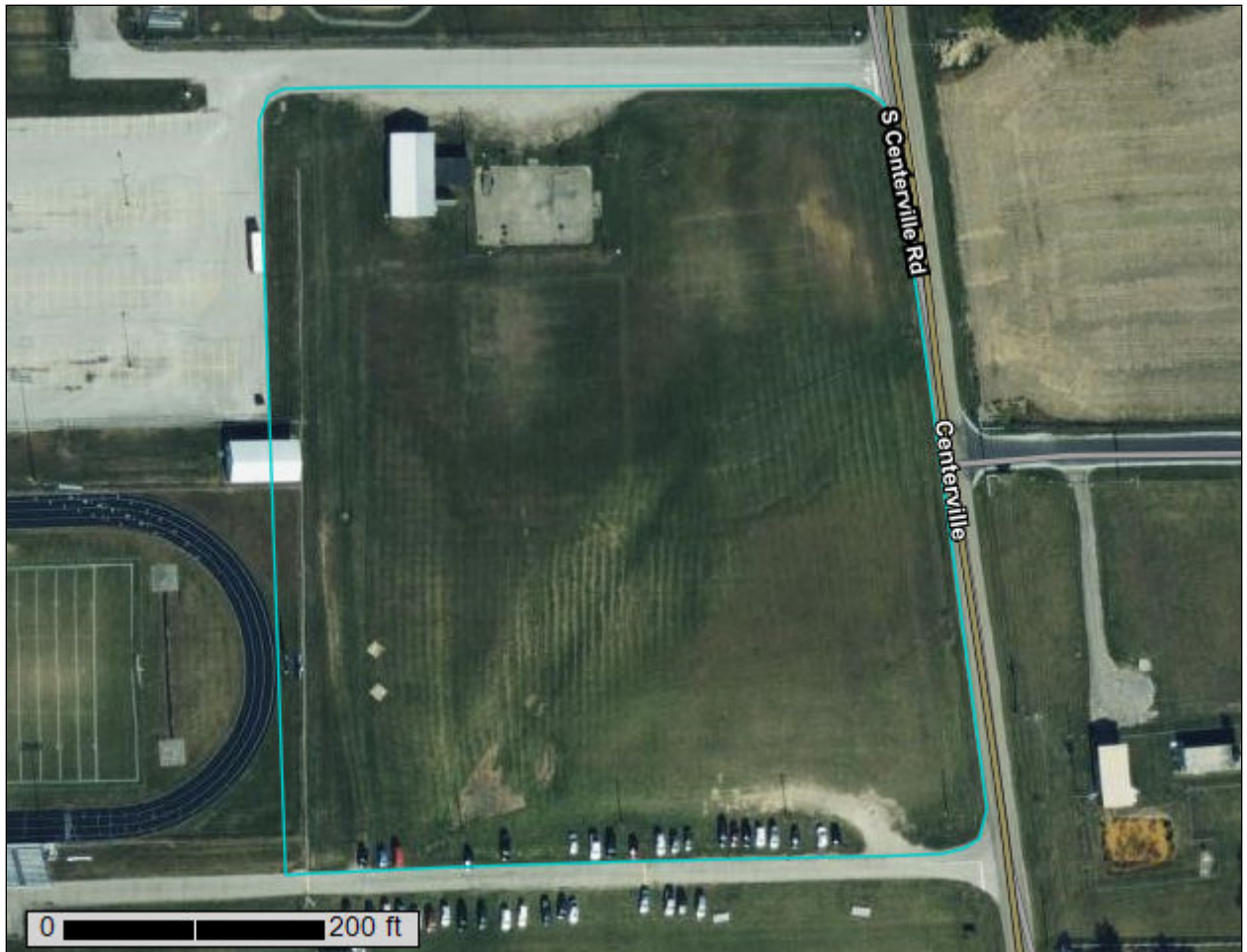
Type	Value	Description
S_S	0.141	MCE_R ground motion. (for 0.2 second period)
S_1	0.075	MCE_R ground motion. (for 1.0s period)
S_{MS}	0.226	Site-modified spectral acceleration value
S_{M1}	0.18	Site-modified spectral acceleration value
S_{DS}	0.15	Numeric seismic design value at 0.2 second SA
S_{D1}	0.12	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	B	Seismic design category
F_a	1.6	Site amplification factor at 0.2 second
F_v	2.4	Site amplification factor at 1.0 second
PGA	0.066	MCE_G peak ground acceleration
F_{PGA}	1.6	Site amplification factor at PGA
PGA_M	0.106	Site modified peak ground acceleration
T_L	12	Long-period transition period in seconds
$SsRT$	0.141	Probabilistic risk-targeted ground motion. (0.2 second)
$SsUH$	0.154	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	1.5	Factored deterministic acceleration value. (0.2 second)
$S1RT$	0.075	Probabilistic risk-targeted ground motion. (1.0 second)
$S1UH$	0.086	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
$S1D$	0.6	Factored deterministic acceleration value. (1.0 second)
$PGAd$	0.6	Factored deterministic acceleration value. (Peak Ground Acceleration)
C_{RS}	0.918	Mapped value of the risk coefficient at short periods
C_{R1}	0.874	Mapped value of the risk coefficient at a period of 1 s

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Custom Soil Resource Report for Wayne County, Indiana



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

Preface	2
How Soil Surveys Are Made	5
Soil Map	8
Soil Map.....	9
Legend.....	10
Map Unit Legend.....	11
Map Unit Descriptions.....	11
Wayne County, Indiana.....	13
CrA—Crosby silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes.....	13
Tr—Treaty silty clay loam, 0 to 1 percent slopes.....	14
References	17

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

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scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

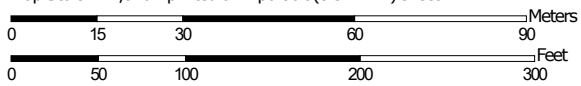
Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map




Map Scale: 1:1,320 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)




















Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

Special Point Features






-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features


Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Wayne County, Indiana
 Survey Area Data: Version 22, Jun 11, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 17, 2019—Oct 20, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CrA	Crosby silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes	2.3	32.1%
Tr	Treaty silty clay loam, 0 to 1 percent slopes	4.8	67.9%
Totals for Area of Interest		7.0	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the

Custom Soil Resource Report

development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Wayne County, Indiana

CrA—Crosby silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2thy7
Elevation: 520 to 1,550 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 48 to 54 degrees F
Frost-free period: 145 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Crosby and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Crosby

Setting

Landform: Water-lain moraines, ground moraines, recessional moraines
Landform position (two-dimensional): Footslope, summit, backslope
Landform position (three-dimensional): Interfluve, rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Silty material or loess over loamy till

Typical profile

Ap - 0 to 8 inches: silt loam
BE - 8 to 11 inches: silt loam
Bt1 - 11 to 14 inches: silt loam
2Bt2 - 14 to 28 inches: silty clay loam
2BCt - 28 to 36 inches: loam
2Cd - 36 to 79 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 24 to 40 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high
(0.01 to 0.20 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 50 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111AY008IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Kokomo, drained

Percent of map unit: 5 percent
Landform: Depressions, water-lain moraines, swales
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111AY007IN - Till Depression Flatwood
Hydric soil rating: Yes

Celina, eroded

Percent of map unit: 4 percent
Landform: Water-lain moraines, ground moraines, recessional moraines
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Side slope, crest, head slope, nose slope, rise
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111AY009IN - Till Ridge
Hydric soil rating: No

Miamian, eroded

Percent of map unit: 1 percent
Landform: Water-lain moraines, ground moraines, recessional moraines
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Side slope, crest, head slope, nose slope, rise
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111AY009IN - Till Ridge
Hydric soil rating: No

Tr—Treaty silty clay loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2ygz
Elevation: 450 to 1,200 feet
Mean annual precipitation: 37 to 46 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 145 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Treaty, frequently ponded, drained, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Treaty, Frequently Ponded, Drained

Setting

Landform: Swales, water-lain moraines, ground moraines, depressions
Landform position (three-dimensional): Dip, talf
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Silty material or loess over loamy till

Typical profile

Ap - 0 to 10 inches: silty clay loam
A - 10 to 14 inches: silty clay loam
Btg1 - 14 to 36 inches: silty clay loam
2Btg2 - 36 to 59 inches: loam
2C - 59 to 79 inches: loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111AY007IN - Till Depression Flatwood
Hydric soil rating: Yes

Minor Components

Pella, frequently ponded, drained

Percent of map unit: 5 percent
Landform: Ground moraines, lake plains, till plains, outwash plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R111AY016IN - Outwash Mollisol
Hydric soil rating: Yes

Rensselaer, frequently ponded, drained

Percent of map unit: 5 percent
Landform: Glacial drainage channels, ground moraines, depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R111AY016IN - Outwash Mollisol
Hydric soil rating: Yes

Custom Soil Resource Report

Crosby

Percent of map unit: 5 percent

Landform: Water-lain moraines, ground moraines, recessional moraines

Landform position (three-dimensional): Rise

Down-slope shape: Convex

Across-slope shape: Linear

Ecological site: F111AY008IN - Wet Till Ridge

Hydric soil rating: No

Southwest, frequently ponded, drained

Percent of map unit: 5 percent

Landform: Drainageways, ground moraines, depressions

Landform position (three-dimensional): Dip

Down-slope shape: Linear, concave

Across-slope shape: Concave, linear

Ecological site: F111AY004IN - Wet Alluvium

Hydric soil rating: Yes

References

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1 **SECTION 077253 - SNOW GUARDS**

2 **PART 1 - GENERAL**

3 **1.1 RELATED DOCUMENTS**

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

6 **1.2 SUMMARY**

- 7 A. Section Includes:

- 8 1. Snow guards.

9 **1.3 ACTION SUBMITTALS**

- 10 A. Product Data: Include construction details, material descriptions, dimensions of individual
11 components and profiles, and finishes for snow guards.

- 12 B. Shop Drawings: Include roof plans showing layouts and attachment details of snow guards.

- 13 1. Include details of Snow guards.

- 14 2. Include calculation of number and location of snow guards based on snow load, roof
15 slope, roof type, components, spacings, and finish.

16 **PART 2 - PRODUCTS**

17 **2.1 PERFORMANCE REQUIREMENTS**

- 18 A. Performance Requirements: Provide snow guards that withstand exposure to weather and
19 resist thermally induced movement without failure, rattling, or fastener disengagement due to
20 defective manufacture, fabrication, installation, or other defects in construction.

- 21 1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material
22 surfaces.

23 **2.2 RAIL-TYPE SNOW GUARDS**

- 24 A. Flat-Mounted, Snow Guards:

- 25 1. Manufacturers: Subject to compliance with requirements, available manufacturers
26 offering products that may be incorporated into the Work include the following:

- 27 a. Alpine SnowGuards; a division of Vermont Slate & Copper Services, Inc.

- 1 b. Berger Building Products.
- 2 c. SnoGuard.
- 3 d. Snow Management Systems; a division of Contek, Inc.

- 4 2. Description: Units fabricated from metal baseplate anchored to fixed bracket and
- 5 equipped with three bars.
- 6 3. Brackets and Baseplate: Aluminum.
- 7 4. Bars: Stainless steel; mill finished.

8 **PART 3 - EXECUTION**

9 **3.1 EXAMINATION**

- 10 A. Examine substrates and conditions, with Installer present, for compliance with requirements
- 11 for installation tolerances, snow guard attachment, and other conditions affecting
- 12 performance of the Work.

- 13 1. Verify compatibility with and suitability of substrates including compatibility with
- 14 existing finishes or primers.

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

16 **3.2 PREPARATION**

- 17 A. Clean and prepare substrates for bonding snow guards.

- 18 B. Prime substrates according to snow guard manufacturer's written instructions.

19 **3.3 INSTALLATION**

- 20 A. Install snow guards according to manufacturer's written instructions. Space rows as
- 21 recommended by manufacturer.

22 **END OF SECTION 077253**

SECTION 087100 - DOOR HARDWARE**PART 1- GENERAL****1.1 RELATED DOCUMENTS**

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

1.2 SUMMARY

- A. This section includes items known commercially as finish or door hardware that are required for swing, sliding, and folding doors, except special types of unique hardware specified in the same sections as the doors and door frames on which they are installed.

- B. This section includes the following:

1. Hinges.
2. Lock cylinders and keys.
3. Lock and latch sets.
4. Bolts.
5. Push/pull units.
6. Closers.
7. Overhead stops
8. Kick plates.
9. Smoke Seals

- C. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 6 Section "Interior Architectural Woodwork" for cabinet hardware.
2. Division 8 Section "Standard Steel Doors and Frames" for silencers integral with hollow metal frames.
3. Division 8 Section "Flush Wood Doors" for factory prefitting and factory premachining of doors for door hardware.

1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification sections.
- B. Product data including manufacturer's technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
- C. Final hardware schedule coordinated with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

- 1 1. Final Hardware Schedule Content: Based on hardware indicated, organize schedule into
2 “hardware sets” indicating complete designations of every item required for each door or
3 opening. Include the following information:
4
5 a. Type, style, function, size, and finish of each hardware item.
6 b. Name and manufacturer of each item.
7 c. Fastenings and other pertinent information.
8 d. Location of each hardware set cross referenced to indications on Drawings both on floor
9 plans and in door and frame schedule.
10 e. Explanation of all abbreviations, symbols, and codes contained in schedule.
11 f. Mounting locations for hardware.
12 g. Door and frame sizes and materials.
13 h. Keying information.
14
- 15 2. Submittal Sequence: Submit final schedule at earliest possible date particularly where
16 acceptance of hardware schedule must precede fabrication of other work that is critical in
17 the Project construction schedule. Include with schedule the product data, samples, shop
18 drawings of other work affected by door hardware, and other information essential to the
19 coordinated review of schedule
- 20 3. Keying Schedule: Submit separate detailed schedule indicating clearly how the Owner’s final
21 instructions on keying of locks has been fulfilled.
22
- 23 D. Templates for doors, frames, and other work specified to be factory prepared for the installation
24 of door hardware. Check shop drawing of other work to confirm that adequate provision are
25 made for locating and installing door hardware to comply with indicated requirements.
26

27 **1.4 QUALITY ASSURANCE**

28

- 29 A. Single Source Responsibility: Obtain each type of hardware (latch and lock sets, hinges, closers,
30 etc.) From a single manufacturer
31
- 32 B. Supplier Qualification: A recognized architectural door hardware supplier, with warehousing
33 facilities within 50 miles of the job site that has a record of successful in-service performance for
34 supplying door hardware similar in quantity, type, and quality to that indicated for this Project
35 and that employs an experienced architectural hardware consultant who is available to Owner,
36 Architect, and Contractor, at reasonable times during the course of the Work, for consultation..
37
- 38 1. Require supplier to meet with Owner to finalize keying requirements and to obtain final
39 instructions in writing.
40
- 41 C. Fire-Rated Openings: Provide door hardware for fire-rated openings that complies with NFPA
42 Standard No. 80 and requirements of authorities having jurisdiction. Provide only items of door
43 hardware that are listed and are identical to Protect tested by UL, Warnock Hersey, FM, or other
44 testing and inspecting organization acceptable to authorities having jurisdiction for use on types
45 and sizes of door indicated in compliance with requirements of fire-rated door and door frame
46 labels

1.5 PRODUCT HANDLING

- A. Tag each item or package separately with identification related to final hardware schedule, and include basic installation instructions with each item or package.
- B. Packaging of door hardware is responsibility of supplier. As material is received by hardware supplier from various manufacturers, sort and repackage in containers clearly marked with appropriate hardware set number to match set number of approved hardware schedule. Two or more identical sets may be packed in same container.
- C. Inventory door hardware jointly with representative of hardware supplier and hardware installer until each is satisfied that count is correct.
- D. Deliver individually packaged door hardware items promptly to place of installation (shop or Project site).
- E. Provide secure lock-up for door hardware delivered to the Project, but not yet installed. Control handling and installation of hardware items that are not immediately replaceable so that completion of the Work will not be delayed by hardware losses both before and after installation.

1.6 MAINTENANCE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS**2.1 MANUFACTURERS**

- A. Available Manufacturers: subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include the following: (Manufacturer whose name is prefixed with an asterisk *, indicates the manufacturer whose products are listed in the schedule at the end of this section.)

1. Butts and Hinges:

- a. * Ives
- b. Stanley
- c. Hager

2. Lock and Latchsets

- a. *Schlage

1 3. Wall and Floor Stops and Flush Bolts

- 2
3 a. * H.B. Ives Co.
4 b. Rockwood
5 c. Trimco

6
7 4. Overhead Closer and Automatic Door Operators:

- 8
9 a. *LCN

10
11 5. Kick, Mop, and Armor Plates:

- 12
13 a. * Ives
14 b. Baldwin
15 c. Trimco

16
17 6. Exit Devices, Mullions

- 18
19 a. *Von Duprin

20
21 7. Lock Cores

- 22
23 a. *Best

24
25 8. Overhead Stops/holders

- 26
27 a. *Glynn Johnson

28
29 9. Threshold, Weatherstripping, Seals

- 30
31 a. *National Guard Products

32
33 **2.2 SCHEDULED HARDWARE**

34
35 A. Requirements for design, grade, function, finish, size, and other distinctive qualities of each type
36 of finish hardware are indicated in the "Hardware Schedule" at the end of this Section. Products
37 are identified by using hardware designation numbers of the following:

- 38
39 1. Manufacturer's Product Designation: The product designation and name of one
40 manufacturer are listed for each hardware type required for the purpose of establishing
41 minimum requirements. Provide either the product designated or, where more than one
42 manufacturer is specified under the Article "Manufacturers" in Part 2 for each hardware
43 type, the comparable product of one of the other manufacturers that complies with
44 requirements.

45
46

2.3 MATERIALS AND FABRICATION

- 1
2
3 A. Manufacturer's Name Plate: Do not use manufacturers' products that have manufacturer's
4 name or trade name displayed in a visible location (omit removable nameplates) except in
5 conjunction with required fire-rated labels and as otherwise acceptable to Architect.
6
7 1. Manufacturer's identification will be permitted on rim of lock cylinders only.
8
9 B. Base Metals: Produce hardware units of basic metal and forming method indicated using
10 manufacturer's standard metal alloy, composition, temper, and hardness, but in no case of
11 lesser (commercially recognized) quality than specified for applicable hardware unit for finish
12 designations indicated.
13
14 C. Fastener: provide hardware manufactured to conform to published templated, generally
15 prepared for machine screw installation. Do not provide hardware that has been prepared for
16 self-tapping sheet metal screws, except as specifically indicated.
17
18 D. Furnish screws for installation with each hardware item. Provide Phillips flat-head screws
19 except as otherwise indicated. Finish exposed (exposed under any condition) screws to match
20 hardware finish or, if exposed in surfaces of other work, to match finish of this other work as
21 closely as possible including "prepared for paint" surfaces to receive painted finish.
22

2.4 HINGES, BUTTS, AND PIVOTS

- 23
24
25 A. Templates: Except for hinges and pivots to be installed entirely (both leaves) into wood doors
26 and frames, provide only template-produced units.
27
28 B. Screws: Provide Phillips flat-head screws complying with the following requirements:
29
30 1. For metal doors and frames install machine screws into drilled and tapped holes.
31 2. For wood doors and frames install wood screws.
32 3. For fire-rated wood doors install #12 x 1 1/4-inch (32mm), threaded-to-the-head steel wood
33 screws.
34 4. Finish screw heads to match surface of hinges or pivots
35
36 C. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
37
38 1. Out-Swing Exterior Doors: Nonremovable pins.
39 2. Interior Doors: Nonrising pins.
40 3. Tips: Flat button and matching plug, finished to match leaves, except where hospital tip (HT)
41 indicated.
42
43 D. Number of Hinges: Provide number of hinges indicated but not less than 3 hinges per door leaf
44 for doors 90 inches (2250mm) or less in height and one additional hinge for each 30 inches
45 (750mm) of additional height.
46

- 1 1. Fire-Rated Doors: Not less than 3 hinges per door leaf for doors 86 inches (2150mm) or less
2 in height with same rule for additional hinges.

3
4 **2.5 LOCK CYLINDERS AND KEYING**

- 5
6 A. Provide Best lock cylinders keyed into the existing Best keying system. Allow for 3 change keys
7 per lock/cylinder.

8
9 **2.6 LOCKS, LATCHES, AND BOLTS**

- 10
11 A. Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with
12 curved lip extended to protect frame, finished to match hardware set, unless otherwise
13 indicated.

- 14
15 1. Provide flat lip strikes for locks with 3-piece, antifriction latch bolts as recommended by
16 manufacturer.
17 2. Provide extra long strike lips for locks used on frames with applied wood casing trim.
18 3. Provide recess type top strikes for bolts locking into head frames, unless otherwise
19 indicated.

- 20
21 B. Lock Throw: Provide 5/8-inch (16mm) minimum throw of latch on pairs of doors. Comply with
22 UL requirements for throw of bolts and latch bolts on rated fire openings.

- 23
24 1. Provide ½-inch (13mm) minimum throw of latch for other bored and preassembled types of
25 locks and 3/4-inch (19mm) minimum throw of latch for mortise locks. Provide 1-inch
26 (25mm) minimum throw for all dead bolts.

- 27
28 C. Flush Bolt Heads: Minimum of ½-inch (13mm) diameter rods of brass, bronze, or stainless steel
29 with minimum 12-inch (300mm) long rod for doors up to 84 inches (2100mm) in heights.
30 Provide longer rods as necessary for doors exceeding 84 inches (2100mm) in height.

- 31
32 D. Exit Device Dogging: Except on fire-rated doors where closers are provided on doors equipped
33 with exit devices, equip the unit with keyed dogging device to keep the latch bolt retracted,
34 when engaged.

35
36 **2.7 PUSH/PULL UNITS**

- 37
38 A. Exposed Fasteners: Provide manufacturer's standard exposed fasteners for installation, thru-
39 bolted for matched pairs but not for single units.

- 40
41 B. Concealed Fasteners: Provide manufacturer's special concealed fastener system for installation,
42 thru-bolted for matched pairs but not for single units.

2.8 CLOSERS AND DOOR CONTROL DEVICES

- 1
- 2
- 3 A. Size of Units: Except as otherwise specifically indicated, comply with the manufacturer's
- 4 recommendations for size of door control unit depending on size of door, exposure to weather,
- 5 and anticipated frequency of use.
- 6
- 7 1. Where parallel arms are indicated for closers, provide closer unit one size larger than
- 8 recommended for use with standard arms.
- 9 2. Provide parallel arms for all overhead closers, except as otherwise indicated.
- 10
- 11 B. Access-Free Manual Closers: Where manual closers are indicated for doors required to be
- 12 accessible to the physically handicapped, provide adjustable units complying with ANSI A117.1
- 13 provisions for door opening force and delayed action closing.
- 14
- 15 C. Combination Door Closers and Holders: Provide units designed to hold door in open position
- 16 under normal usage and to release and close door automatically under fire conditions.
- 17 Incorporate an integral electromagnetic holder mechanism designed for use with UL listed fire
- 18 detectors, provided with normally closed switching contacts.
- 19

2.9 DOOR TRIM UNITS

- 20
- 21
- 22 A. Fasteners: Provide manufacturer's standard exposed fasteners for door trim units consisting of
- 23 either machine screws or self-tapping screws.
- 24
- 25 B. Fabricate edge trim of stainless steel to fit door thickness in standard lengths or to match height
- 26 of protection plates.
- 27
- 28 C. Fabricate protection plates not more than 2 inches less than door width on the push side by the
- 29 height indicated.
- 30
- 31 1. Metal Plates: Stainless Steel, .050 inch (U.S. 16 gage) (1.6mm).
- 32

2.10 HARDWARE FINISHES

- 33
- 34
- 35 A. Match items to the manufacturer's standard color and texture finish for the latch and lock sets
- 36 (for push-pull units if no latch or lock sets).
- 37
- 38 B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness,
- 39 and other qualities complying with manufacturer's standards, but in no case less than specified
- 40 by referenced standards for the applicable units of hardware.
- 41
- 42 C. The designations used in schedules and elsewhere to indicate hardware finishes are the industry
- 43 recognized standard commercial finishes, except as otherwise noted.
- 44
- 45

- 1 1. Rust-Resistant Finish: For iron and steel base metal required for exterior work and in areas
2 shown as “High Humidity” areas (and also when designed with the suffix-RR), provide 0.2ml
3 (0.005mm) thick copper coating on base metal before applying brass, bronze, nickel, or
4 chromium plated finishes.
5
6

7 **PART 3 - EXECUTION**

8 9 **3.1 INSTALLATION**

- 10
11 A. Mount hardware units at heights indicated in following applicable publication, except as
12 specifically indicated or required to comply with governing regulation and except as otherwise
13 directed by Architect.
14

- 15 1. “Recommended Locations for Builders Hardware for Standard Steel Doors and Frames” by
16 the Door and Hardware Institute.
17

- 18 B. Install each hardware item in compliance with the manufacturer’s instructions and
19 recommendations. Where cutting and fitting is required to install hardware onto or into
20 surfaces that are later to be painted or finished in another way, coordinate removal, storage,
21 and reinstallation or application of surface protection with finishing work specified in the
22 Division 9 Section. Do not install surface mounted items until finishes have been completed on
23 the substrates involved.
24

- 25 C. Set units level, plumb, and true to line and location. Adjust and reinforce the attachment
26 substrate as necessary for proper installation and operation.
27

- 28 D. Drill and countersink units that are not factory prepared for anchorage fasteners. Space
29 fasteners and anchors in accordance with industry standards.
30

- 31 E. Set thresholds for exterior doors in full bed of butyl-rubber or polyisobutylene mastic sealant
32 complying with requirements specified in Division 7 Section “Joint Sealers.”
33

- 34 F. Weatherstripping and Seals: Comply with manufacturer’s instructions and recommendations to
35 the extent installation requirements are not otherwise indicated.
36

37 **3.2 ADJUSTING, CLEANING, AND DEMONSTRATING**

- 38
39 A. Adjust and check each operating item of hardware and each door to ensure proper operation or
40 function of every unit. Replace units that cannot be adjusted to operate freely and smoothly or
41 as intended for the application made.
42

- 43 B. Clean adjacent surfaces soiled by hardware installation.
44

- 45 C. Instruct Owner’s personnel in proper adjustment and maintenance of door hardware and
46 hardware finishes.

3.3 ELECTRONIC DOOR HARDWARE – Responsibility

- 1
2
3 A. *Hardware supplier is responsible to provide/install all low voltage wiring for all electronic door*
4 *hardware provided in this section, including electronic exit devices, power supplies, power*
5 *transfers, electric strikes, electric locks, automatic door operators, operator actuators, and other*
6 *electronic door hardware specified and provided as part of this specification section.*
7
8 B. *Hardware supplier is also required to install/wire/program all new automatic door operators and*
9 *actuators and to relocate/reinstall reused automatic door operators and actuators.*
10
11 C. *Installers are required to be factory trained/certified by manufacturers of electronic door*
12 *hardware.*
13
14 D. *Electrical Contractor is responsible to Provide and Install 120V power to all power supplies,*
15 *automatic operator headers, and other locations required, noted herein, and/or shown on the*
16 *electrical drawings. Electrical Contractor is also responsible to provide and install all conduit*
17 *and/or wire chases for low voltage wiring and all required electrical boxes and junction boxes.*
18
19 E. *Hardware Supplier is to meet with Electrical Contractor early during the construction period to*
20 *instruct E.C. in requirements for power and for low voltage conduit/chases. Hardware supplier*
21 *and E.C. are to communicate continually during construction as necessary to coordinate power*
22 *with low voltage (hardware) requirements.*
23
24 F. *Access Control System and all materials provided by the security contractor (including, but not*
25 *limited to Card Readers) are to be installed and wired by that contractor.*
26

3.4 HARDWARE SCHEDULE

- 27
28
29 A. General: Provide hardware for each door to comply with requirements of Section “Door
30 Hardware,” hardware set numbers indicated in door schedule, and in the following schedule of
31 hardware sets.
32
33

Hardware Sets

SET #001

Doors: 100

6	1	Continuous Hinge	112HD 83" EPT	710	IV
7	1	Exit Device	SD-QEL 99NL-OP x 110MD-NL	SP313, 313	VO
8	2	Core	1CB-7B101	606	BE
9	1	Mortise Cylinder Housing	80-102	613	SC
10	1	Rim Cylinder Housing	80-129	613	SC
11	1	Offset Door Pull	BF158	10BE	RO
12	1	Closer	4040XP RWPA	DKBRZ	LC
13	1	Adapter Plate	4040XP-18PA	DKBRZ	LC
14	1	Overhead Stop	104S	US10B	GL
15	1	Power Supply	PS902 900-2RS		VO
16	1	Electric Power Transfer	EPT 10	SP313	VO
17	1	Door Sweep	D698DKB 36"		NA

NOTE: Card Readers by Others. Perimeter seals by aluminum door supplier.

SET #002

Doors: 101

24	1	Continuous Hinge	112HD 83"	710	IV
25	1	Push/Pull Bar	BF15847 32"	10BE	RO
26			NOTE: confirm CTC dimension with door supplier.		
27	1	Closer	4040XP RWPA	DKBRZ	LC
28	1	Adapter Plate	4040XP-18PA	DKBRZ	LC
29	1	Wall Stop	WS406/407CCV	US10B	IV

SET #003

Doors: 102A

34	3	Hinges	5BB1 4 1/2 x 4 1/2	652	IV
35	1	Lockset	ND53BDC RHO 10-025	626	SC
36	1	Core	1CB-7B101 3856	626	BE
37	1	Wall Stop	WS406/407CCV	US32D	IV

1	SET #004				
2	Doors: 102B				
3					
4	3	Hinges	5BB1 4 1/2 x 4 1/2	652	IV
5	1	Lockset	ND53BDC RHO 10-025	626	SC
6	1	Core	1CB-7B101 3856	626	BE
7	1	Closer	4040XP REGARM	AL	LC
8	1	Wall Stop	WS406/407CCV	US32D	IV
9					
10	SET #005				
11	Doors: 103, 105				
12					
13	3	Hinges	5BB1 4 1/2 x 4 1/2	652	IV
14	1	Deadbolt	B571 10-087	626	SC
15			NOTE: Locate 48" C/L AFF		
16	1	Leverset	ND10 RHO 10-025	626	SC
17	1	Closer	4040XP REGARM	AL	LC
18	1	Wall Stop	WS406/407CCV	US32D	IV
19					
20	SET #006				
21	Doors: 104				
22					
23	3	Hinges	5BB1 4 1/2 x 4 1/2	652	IV
24	1	Lockset	ND70BDC RHO 10-025	626	SC
25	1	Core	1CB-7B101 3856	626	BE
26	1	Closer	4040XP RWPA	AL	LC
27	1	Wall Stop	WS406/407CCV	US32D	IV
28					
29	SET #007				
30	Doors: 108				
31					
32	6	Hinges	5BB1 4 1/2 x 4 1/2	652	IV
33	2	Flush Bolt	FB458 12"	US26D	IV
34	1	Lockset	ND70BDC RHO 10-025	626	SC
35	1	Core	1CB-7B101 3856	626	BE
36	2	Overhead Holder	904H	US32D	GL
37					
38					

1	SET #008				
2	Doors: 111B, 111E				
3					
4	1	Continuous Hinge	112HD 83"	628	IV
5	1	Lockset	ND80BDC RHO 10-025	626	SC
6	1	Core	1CB-7B101 3856	626	BE
7	1	Closer	4040XP RW62A	AL	LC
8	1	Overhead Stop	904S	US32D	GL
9	1	Gasketing Set	160 V 3' X 7'		NA
10	1	Drip Cap	16 A 40"		NA
11	1	Door Sweep	D698A 36"		NA
12	1	Panic Threshold	884 V 36"	AL	NA

13					
14	SET #009				
15	Doors: 112				
16					
17	3	Hinges	5BB1 4 1/2 x 4 1/2	652	IV
18	1	Lockset	ND80BDC RHO 10-025	626	SC
19	1	Core	1CB-7B101 3856	626	BE
20	1	Overhead Stop	904S	US32D	GL

21					
22	SET #010				
23	Doors: 202, 203				
24					
25	3	Hinges	5BB1 4 1/2 x 4 1/2	652	IV
26	1	Lockset	ND80BDC RHO 10-025	626	SC
27	1	Core	1CB-7B101 3856	626	BE
28	1	Wall Stop	WS406/407CCV	US32D	IV

29					
30	SET #011				
31	Doors: 111A, 111C, 111D, 111F				

NOTE: All hardware by door manufacturer.

32
33
34
35
36
37
38 **END OF SECTION 087100**

1 **SECTION 133419 – METAL BUILDING SYSTEMS**

2 **PART 1 GENERAL**

3 **1.01 SECTION INCLUDES**

- 4 A. Manufacturer-engineered, shop-fabricated structural steel building frame.

5 **1.02 RELATED REQUIREMENTS**

- 6 A. Section 055000 - Metal Fabrications.

- 7 B. Section 079200 - Joint Sealants: Sealing joints between accessory components and wall
8 system.

- 9 C. Section 081113 - Hollow Metal Doors and Frames.

- 10 D. Section 083613 - Sectional Doors.

- 11 E. Section 084113 – Aluminum-Framed Entrances and Storefronts.

12 **1.03 REFERENCE STANDARDS**

- 13 A. AISC 360 - Specification for Structural Steel Buildings 2016 (Revised 2021).

- 14 B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.

- 15 C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron
16 and Steel Products 2017.

- 17 D. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel
18 Hardware 2016a.

- 19 E. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000
20 PSI Tensile Strength 2021.

- 21 F. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon
22 Steel Structural Tubing in Rounds and Shapes 2021a.

- 23 G. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon
24 Steel Structural Tubing 2021.

- 25 H. ASTM A529/A529M - Standard Specification for High-Strength Carbon-Manganese Steel of
26 Structural Quality 2019.

- 27 I. ASTM A572/A572M - Standard Specification for High-Strength Low-Alloy Columbium-
28 Vanadium Structural Steel 2021, with Editorial Revision.

- 29 J. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-
30 Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2020.

- 1 K. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated
2 by the Hot-Dip Process 2021a.
- 3 L. ASTM A992/A992M - Standard Specification for Structural Steel Shapes 2020.
- 4 M. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light
5 Frame Construction and Manufactured Housing 2017.
- 6 N. ASTM C827/C827M - Standard Test Method for Change in Height at Early Ages of Cylindrical
7 Specimens of Cementitious Mixtures 2016.
- 8 O. ASTM C920 - Standard Specification for Elastomeric Joint Sealants 2018.
- 9 P. ASTM C991 - Standard Specification for Flexible Fibrous Glass Insulation for Metal Buildings
10 2016.
- 11 Q. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout
12 (Nonshrink) 2020.
- 13 R. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials
14 2021a.
- 15 S. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor
16 Transmission Rate of Materials 2021.
- 17 T. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield
18 Strength 2020.
- 19 U. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and
20 Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi
21 Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile
22 Strength 2021.
- 23 V. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination 2020.
- 24 W. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification 2014
25 (Amended 2015).
- 26 X. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020, with Errata (2021).
- 27 Y. IAS AC472 - Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building
28 Systems 2018.
- 29 Z. MBMA (MBSM) - Metal Building Systems Manual 2019.
- 30 AA. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic) 2019.
- 31 BB. UL 580 - Standard for Tests for Uplift Resistance of Roof Assemblies Current Edition, Including
32 All Revisions.

33 **1.04 ADMINISTRATIVE REQUIREMENTS**

- 34 A. Preinstallation Meeting: Convene one week before starting work of this section.

1 **1.05 SUBMITTALS**

- 2 A. See Section 013000 - Administrative Requirements, for submittal procedures.
- 3 B. Product Data: Provide data on profiles, component dimensions, fasteners.
- 4 C. Shop Drawings: Indicate assembly dimensions, locations of structural members, connections;
5 wall and roof system dimensions, panel layout, general construction details, anchors and
6 methods of anchorage, and installation; framing anchor bolt settings, sizes, locations from
7 datum, and foundation loads; indicate welded connections with AWS A2.4 welding symbols;
8 indicate net weld lengths; provide professional seal and signature.
- 9 D. Samples: Submit two samples of precoated metal panels for each color selected, illustrating
10 color and texture of finish.
- 11 E. Manufacturer's Instructions: Indicate preparation requirements, anchor bolt placement.
- 12 F. Erection Drawings: Indicate members by label, assembly sequence, and temporary erection
13 bracing.
- 14 G. Certifications: Shop drawings and design analysis shall bear the seal of a registered
15 professional engineer upon request. Design analysis shall be on file and furnished by
16 manufacturer upon request.
- 17 H. Manufacturer's Qualification Statement: Provide documentation showing metal building
18 manufacturer is accredited under IAS AC472.
- 19 1. Include statement that manufacturer designs and fabricates metal building system as
20 integrated components and assemblies, including but not limited to primary structural
21 members, secondary members, joints, roof, and wall cladding components specifically
22 designed to support and transfer loads and properly assembled components form a
23 complete or partial building shell.
- 24 I. Bill of Materials: Bills of material shall be furnished and shall include item weights.
- 25 J. Erector's Qualification Statement.
- 26 K. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M
27 and dated no more than 12 months before start of scheduled welding work.
- 28 L. Project Record Documents: Record actual locations of concealed components and utilities.
- 29 M. Preventative Maintenance Manual.

30 **1.06 QUALITY ASSURANCE**

- 31 A. Designer Qualifications: Design structural components, develop shop drawings, and perform
32 shop and site work under direct supervision of a Professional Structural Engineer experienced
33 in design of this type of work.
- 34 1. Design Engineer Qualifications: Licensed in the State in which the Project is located.
- 35 2. Comply with applicable code for submission of design calculations as required for
36 acquiring permits.

- 1 3. Cooperate with regulatory agency or authorities having jurisdiction (AHJ), and provide
2 data as requested.
- 3 B. Perform work in accordance with AISC 360 and MBMA (MBSM).
- 4 1. Maintain one copy on site.
- 5 C. Manufacturer Qualifications: Company specializing in the manufacture of products similar to
6 those required for this project.
- 7 1. Not less than five years of documented experience.
- 8 2. Accredited by IAS in accordance with IAS AC472.
- 9 D. Erector Qualifications: Company specializing in performing the work of this section with
10 minimum five years experience.
- 11 E. Welder Qualifications: Welding processes and welding operators qualified in accordance with
12 AWS D1.1/D1.1M and no more than 12 months before start of scheduled welding work.

13 **1.07 WARRANTY**

- 14 A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
- 15 B. Building System Warranty
- 16 1. Furnish manufacturer's standard warranty for the metal building system, excluding paint.
17 2. The manufacturer shall warrant the metal building system against failure due to defective
18 material or workmanship for a period of one (1) year from date of substantial completion.
- 19 C. Roof and Wall Paint Finish Warranty
- 20 1. Furnish manufacturer's standard warranty for the metal panel paint system against
21 chipping, peeling, blistering, fading in excess of 5 NBS Hunter units as set forth in ASTM-
22 D-2244, and chalking in excess of 8 units as set forth in ASTM-D-4214.
23 2. The warranty shall be for a period of 25 years from the date of shipment for silicone-
24 polyester paint systems.

25 **1.08 DELIVERY, STORAGE AND HANDLING**

- 26 A. Delivery and Acceptance Requirements: Deliver materials to site in manufacturer's original,
27 unopened containers and packaging, with labels clearly identifying product name and
28 manufacturer.
- 29 B. Storage and Handling Requirements:
- 30 1. Store and handle materials in accordance with manufacturer's instructions.
31 2. Keep materials in manufacturer's original, unopened containers and packaging until
32 installation.
33 3. Do not store materials directly on ground.
34 4. Store materials on flat, level surface, raised above ground, with adequate support to
35 prevent sagging.
36 5. Protect materials and finish during storage, handling, and installation to prevent damage.

1 C. Maintain environmental conditions (temperature, humidity, and ventilation) within limits
2 recommended by manufacturer for optimum results. Do not install products under
3 environmental conditions outside manufacturer's absolute limits.

4 D. Store and dispose of hazardous materials, and materials contaminated by hazardous materials,
5 in accordance with requirements of local authorities having jurisdiction.

6 **1.09 DESIGN REQUIREMENTS**

7 **A. General**

8 1. The building manufacturer will use standards, specifications, recommendations, findings
9 and/or interpretations of professionally-recognized groups such as AISC, AISI, AWS,
10 ASTM, CSA, CWB, MBMA, Federal Specifications, and unpublished research by MBMA
11 as the basis for establishing design, drafting, fabrication, and quality criteria, practices,
12 and tolerances. The Manufacturer's design, drafting, fabrication and quality criteria,
13 practices, and tolerances shall govern, unless specifically countermanded by the contract
14 documents.

15 2. Design structural mill sections and built-up plate sections in accordance with:

16 a. (US) code-appropriate edition of AISC's "Specification for the Design, Fabrication
17 and Erection of Structural Steel for Buildings", ANSI/AISC 360 ASD method.

18 3. Cold-Formed steel structural members and panels will generally be designed in
19 accordance with "Specifications for the Design of Cold-Formed Steel Structural Members",
20 2007 Edition, ANSI/AISI S-100-07 or CAN CSA S136-07.

21 4. Design weldments per the following:

22 a. Structural Welding

23 1) (US) Design per AWS D1.1, "Structural Welding Code – Steel", Latest Edition.

24 b. Cold-Formed Welding

25 1) (US) Design per AWS D1.3, "Structural Welding Code – Sheet Steel", Latest
26 Edition.

27 **B. Design Code:**

28 1. Structural design for the building structural system shall be provided by the metal building
29 system manufacturer for the following design criteria:

30 a. Governing Building Code: 2014 Indiana Building Code (2012 IBC)

31 b. Occupancy Category: B and S1

32 2. Insulation requirements for the building system shall be provided by for the following
33 energy code or energy standard criteria:

34 a. Governing Energy Code (IECC) or Energy Standard (ASHRAE 90.1).

35 b. Year/Version: 2007.

36 c. Climatic Zone: 5.

37 **C. Design Loads:**

38 1. Dead Load - weight of the building system as determined by manufacturer.

- 1 2. Roof Live Load - 20 psf
- 2 3. Collateral Load - 5 psf
- 3 4. Roof Snow Load - 30 psf ground snow
- 4 5. Wind Load - per 2014 Indiana Building Code (2012 IBC) Exposure C
- 5 6. Seismic Load - per 2014 Indiana Building Code (2012 IBC)
- 6 7. Crane Loads

- 7 a. Crane loads shall be a function of the Service Class as defined by the governing
- 8 code and Crane Manufacturers Association of America (CMAA) and the rated
- 9 tonnage (A- Standby or Infrequent service, B- Light service, C- Moderate service, D-
- 10 Heavy Service, E- Severe Service, F- Continuous Severe Service).
- 11 b. Cranes in Service Class E or F shall be in accordance with AISE 13.
- 12 c. Crane loads will be obtained from the crane manufacturer and supplied by the
- 13 Architect to the metal building system manufacturer at the time of bid.

- 14 1) Basis of design Crane-Tec information:

- 15 (a) Hoist weight: 200 lbs
- 16 (b) Runway electric weight: 200 lbs
- 17 (c) Runway beam: W12x45, 1,800 lbs
- 18 (d) 1-ton load: 2,000 lbs
- 19 (e) Load at each of two support points: 3,200 lbs

- 20 d. Building structure shall be designed for the crane loads in accordance with the
- 21 governing code.

22 **PART 2 PRODUCTS**

23 **2.01 MANUFACTURERS**

24 A. Metal Buildings Systems:

- 25 1. Nucor Building Systems;[Basis of design]: www.nucorbuildingsystems.com/#sle.
- 26 2. Butler Manufacturing Company: www.butlermfg.com/#sle.
- 27 3. Ceco Building Systems: www.cecobuildings.com/#sle.
- 28 4. Kirby Building Systems: www.kirbybuildingsystems.com/#sle.
- 29 5. VP Buildings: www.vp.com/#sle.
- 30 6. Substitutions: See Section 016000 - Product Requirements.

31 **2.02 ASSEMBLIES**

- 32 A. Single span rigid frame.
- 33 B. Primary Framing: Rigid frame of rafter beams and columns, canopy beams and end wall
- 34 columns, and wind bracing.
- 35 C. Secondary Framing: Purlins, Girts, Eave struts, and Clips, and other items detailed.
- 36 D. Wall System: Preformed metal panels of vertical profile, with sub-girt framing/anchorage
- 37 assembly, insulation, and liner sheets, and accessory components.

1 E. Roof System: Preformed metal panels oriented parallel to slope, with sub-girt
2 framing/anchorage assembly and insulation, and accessory components.

3 F. Roof Slope: 3 inches in 12 inches (3/12).

4 **2.03 PERFORMANCE REQUIREMENTS**

5 A. Installed Thermal Resistance of Wall System: R-value of 13.

6 B. Installed Thermal Resistance of Roof System: R-value of 24.

7 C. Design structural members to withstand dead load, applicable snow load, and design loads due
8 to pressure and suction of wind calculated in accordance with applicable code.

9 D. Design structural members to withstand Class 30 wind uplift in accordance with UL 580.

10 E. Exterior wall and roof system shall withstand imposed loads with maximum allowable deflection
11 of 1/90 of span.

12 F. Provide drainage to exterior for water entering or condensation occurring within wall or roof
13 system.

14 G. Size and fabricate wall and roof systems free of distortion or defects detrimental to appearance
15 or performance.

16 **2.04 MATERIALS**

17 A. Primary Framing Steel:

18 1. Steel for hot rolled shapes must conform to the requirements of ASTM Specifications A-
19 36, A-572 or A-992, with minimum yield of 36 or 50 ksi, respectively.

20 2. Steel for built-up sections must conform to the requirements of ASTM A-1011, A-1018, A-
21 529, A-572 or A-36 as applicable, with minimum yield of 42, 46, 50, or 55 ksi as indicated
22 by the design requirements.

23 3. Round Tube must conform to the requirements of ASTM A-500 Grade B with minimum
24 yield strength of 42 ksi.

25 4. Square and Rectangular Tube must conform to the requirements of ASTM A-500 Grade B
26 with a minimum yield strength of 46 ksi.

27 5. Steel for Cold-Formed Endwall "C" sections must conform to the requirements of ASTM A-
28 1011 or A-1039 Grade 55, or ASTM A-653 Grade 55 with minimum yield strength of 55
29 ksi.

30 6. X-bracing will conform to ASTM A-36 or ASTM A-529 for rod and angle bracing or ASTM
31 A-475 for cable bracing.

32 B. Secondary Framing Steel:

33 1. Steel used to form purlins, girts and eave struts must meet the requirements of ASTM A-
34 1011 or ASTM A-1039 Grade 55 for primed material or ASTM A-653 Grade 55 for
35 galvanized material with a minimum yield of 55 ksi.

36 2. Design Thicknesses – Gauge to be determined by design to meet specified loading
37 conditions.

- 1 C. Plate or Bar Stock: ASTM A529/A529M, Grade 50.
- 2 D. Anchor Bolts: ASTM A307, Grade A, with no preference for protective coatings.
- 3 E. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1; galvanized to ASTM A153/A153M.
- 4 F. Welding Materials: Perform in accordance with AWS D1.1/D1.1M.
- 5 G. Grout: ASTM C1107/C1107M; Non-shrink; premixed compound consisting of non-metallic
6 aggregate, cement, water reducing and plasticizing agents.
- 7 1. Minimum Compressive Strength at 48 Hours: 2,000 pounds per square inch (13.7 MPa).
8 2. Minimum Compressive Strength at 28 Days: 7,000 pounds per square inch (48 MPa).
- 9 H. Panels:
- 10 1. Through-fastened panels must have:
- 11 a. (For US and Export) 50 percent minimum aluminum-zinc alloy coating and conform to
12 ASTM A-792 or ASTM A-653 with a minimum yield of 50 ksi.
- 13 2. Panel Finish:
- 14 a. SP Finish: Modified Siliconized Polyester paint system with a 25-year finish warranty.
- 15 I. Panel Fasteners:
- 16 1. For Galvalume® and Painted finished roof panels: Long Life Cast Zinc head.
17 2. For wall panels: Coated carbon steel.
18 3. Color of exposed fastener heads to match the wall and roof panel finish.
19 4. Concealed Fasteners: Self-drilling type, of size required.
- 20 J. Flashing and Trim: Match material, finish, and color of adjacent components. Provide trim at
21 rakes, including peak and corner assemblies, high and low eaves, corners, bases, framed
22 openings and as required or specified to provide weathertightness and a finished appearance.
- 23 K. Roof Clips:
- 24 1. All clips must have factory-applied mastic and designed so that movement between the
25 panel and the clip does not occur.
- 26 2. Short or Tall Fixed clips; shall be either 3 ½ inches (89mm) or 4 ½ inches (114mm) in
27 height. Used for applications where only a moderate amount of thermal expansion and
28 contraction in the roof panel is expected.
- 29 3. Short or Tall Sliding clips: shall be either 3 ½ inches (89mm) or 4 ½ inches (114mm) in
30 height and provide either 1-7/8 inches from neutral position or 3 3/4 total inches of travel
31 for panel thermal expansion and contraction, depending on clip choice.
- 32 4. Super Tall Sliding clips: shall be 5 ½ inches (140mm) in height and provide either 1-7/8
33 inches from neutral position or 3 3/4 total inches of travel for panel thermal expansion and
34 contraction.
- 35 L. Sealant and Closures:

- 1 1. Sidelaps: Factory applied non-skinning Butyl mastic.
- 2 2. Endlaps, Eave, Ridge Assembly, and Gable Flashings: Field applied 100% solids butyl-
- 3 based elastomeric tape sealant, furnished in pre-cut lengths.
- 4 3. Outside Closures: Closed-cell, plastic or metal
- 5 4. Inside Closures: Closed-cell, plastic or metal

6 **2.05 PRIMARY FRAMING**

- 7 A. Rigid Frames: Fabricated as welded built-up "I" sections or hot-rolled sections.
- 8 1. Frame Design: Gable Symmetrical.
- 9 B. Rigid Frame Columns:
- 10 1. Tapered
- 11 C. Rigid Frame Rafters:
- 12 1. Tapered
- 13 D. Endwall Frames / Roof Beams: Fabricated as mill-rolled sections or built-up "I" sections
- 14 depending on design requirements. Fabricate endwall columns of cold-formed "C" sections,
- 15 mill-rolled sections, or built-up "I" sections depending on design requirements.
- 16 E. Interior Columns: Columns supporting rafters of mainframes shall be of the following cross-
- 17 section type(s):
- 18 1. "I"-Shaped (Built-Up or Mill-Rolled depending on design requirements).
- 19 F. Finish: Red-Oxide or Gray Primer
- 20 G. Field Bolted Connections: All field bolted connections shall be designed and detailed utilizing
- 21 ASTM A-325 or A-490 depending on design requirement.

22 **2.06 SECONDARY FRAMING**

- 23 A. Purlins and Girts: Purlins and girts shall be cold-formed "Z" sections with stiffened
- 24 flanges. Flange stiffeners shall be sized to comply with the requirements of the latest edition of
- 25 AISI and LGSi. They shall be pre-punched at the factory to provide for field bolting to the rigid
- 26 frames. They shall be simple or continuous span as required by design. Connection bolts will
- 27 install through the purlin/girt webs, not purlin/girt flanges.
- 28 B. Purlins (Excluding Open Web Joists): Horizontal structural members which support roof
- 29 coverings.
- 30 1. Depth: To be determined by design (8", 9.5", 10" or 12")
- 31 2. Maximum Length: To be determined by design.
- 32 3. Finish: Red Oxide or Gray Primer.
- 33 C. Girts: Horizontal structural members that support vertical panels.
- 34 1. Depth: To be determined by design (8", 9.5", 10", or 12")

- 1 2. Maximum Length: To be determined by design.
- 2 3. Finish: Red Oxide or Gray Primer.
- 3 D. Eave Struts: Unequal flange, cold-formed "C" sections or "Z" purlins.
- 4 1. Depth: To be determined by design (8", 9.5", 10" or 12")
- 5 2. Maximum Length: To be determined by design.
- 6 3. Finish: Red Oxide or Gray Primer.
- 7 E. Base Framing: Base members to which the base of the wall covering may be attached to the
- 8 perimeter of the slab. Secured to the concrete slab with mechanical anchors.
- 9 1. Base channel.
- 10 2. Finish: Red Oxide or Gray Primer.

11 2.07 ROOF PANELS

- 12 A. Nucor Classic Roof™ Panel: A through-fastened roof with 1 1/4 inch (32mm) ribs at 12 inches
- 13 (305mm) on center. The area between the ribs is reinforced to minimize oil-canning.
- 14 1. Gauge: 24
- 15 2. Dimensions: 36 inches (915mm) wide by 1 1/4 inch (32mm) high
- 16 3. Finish/Color: As specified in Article 2.8 PANEL FINISH

17 2.08 WALL PANELS

- 18 A. Nucor Classic™ Wall Panel: A through-fastened sidewall panel with 1 1/4 inch (32mm) ribs at
- 19 12 inches (305mm) on center. The area between the ribs is reinforced to minimize oil-canning.
- 20 1. Gauge: 26
- 21 2. Dimensions: 36 inches (915mm) wide by 1 1/4 inch (32mm) high
- 22 3. Finish/Color: As specified in Article 2.8 PANEL FINISH

23 2.09 ACCESSORIES

- 24 A. Canopies: Overhanging or projecting roof structures off the sidewall or endwall with the extreme
- 25 end usually unsupported. For aesthetic application or to cover entrance or walkway.
- 26 B. Roof Line Trim:
- 27 1. Trim Type: Low-Eave Gutter / Sculptured Rake Trim
- 28 C. Purlin Extensions: Overhanging or projecting roof structure at the end of a building.
- 29 D. Framed Openings: Used to frame out doors, windows, louvers, and any other openings. Refers
- 30 to the framing members and flashing which surround an opening and includes jambs, header
- 31 and or sill, trim, and fasteners.
- 32 E. Liner Panels: Nucor Classic™ Liner Panel: A through-fastened sidewall panel with 1 1/4 inch
- 33 (32mm) ribs at 12 inches (305mm) on center. The area between the ribs is reinforced to
- 34 minimize oil-canning.

- 1 1. Gauge: 24
- 2 2. Dimensions: 36 inches (915mm) wide by 1 1/4 inch (32mm) high
- 3 3. Finish: As specified in Article 2.8 PANEL FINISHES

- 4 F. Soffit Panels:

- 5 1. Nucor Classic™ Wall Panel: A through-fastened sidewall panel with 1 1/4 inch (32mm)
- 6 ribs at 12 inches (305mm) on center. The area between the ribs is reinforced to minimize
- 7 oil-canning.

- 8 a. Gauge: 26
- 9 b. Dimensions: 36 inches (915mm) wide by 1 1/4 inch (32mm) high
- 10 c. Finish: As specified in Article 2.8 PANEL FINISHES

- 11 G. Pipe Flashings: Pipe flashing shall be of a one piece construction and fabricated from an EPDM
- 12 membrane and shall have an aluminum base that can be field conformed to any panel
- 13 configuration. Pipe flashings shall be flexible for mounting on any roof slope. Service
- 14 temperature ranges shall be from -30°F to +250°F. Three standard flashing sizes shall
- 15 accommodate pipe sizes from 1/4" diameter up to 13" diameter.

- 16 1. Size: 1/4" to 4" (6 to 102mm) Pipe
- 17 2. Size: 4" to 7" (102 to 178mm) Pipe
- 18 3. Size: 7" to 13" (178 to 330mm) Pipe

- 19 **2.10 PANEL FINISHES**

- 20 A. Roof Panel:

- 21 1. Nucor Standard Panel Paint System (Siliconized Polyester Resin, 25-year Finish
- 22 Warranty):

- 23 a. Color to be selected from full range of standard colors.

- 24 B. Wall Panel:

- 25 1. Nucor Standard Panel Paint System (Siliconized Polyester Resin, 25-year Finish
- 26 Warranty):

- 27 a. Color to be selected from full range of standard colors.

- 28 C. Liner Panel:

- 29 1. Nucor Standard Panel Paint System (Siliconized Polyester Resin, 25-year Finish
- 30 Warranty):
- 31 2. 24 gauge:

- 32 a. Color to be selected from full range of standard colors.

- 33 D. Soffit Panel:

- 34 1. Nucor Standard Panel Paint System (Siliconized Polyester Resin, 25-year Finish
- 35 Warranty):

1 a. Color to be selected from full range of standard colors.

2 **2.11 COMPONENTS**

3 A. Doors and Frames: Specified in Section 081113.

4 B. Overhead Doors: Specified in Section 083613.

5 C. Windows: Specified in Section 085200.

6 **2.12 FABRICATION - FRAMING**

7 A. General:

- 8 1. Shop-fabricate all framing members for field bolted assembly. The surfaces of the bolted
9 connections must be smooth and free from burrs or distortions.
- 10 2. Shop connections must conform to the manufacturer's standard design practices as
11 defined in this section. Certification of welder qualifications will be furnished when required
12 and specified in advance.
- 13 3. All framing members must carry an identifying mark.

14 B. Anchor Bolts: Formed with bent shank, assembled with template for casting into concrete.

15 C. Primary Framing:

- 16 1. Plates, Stiffeners and Related Members: Factory weld base plates splice plates, cap
17 plates, and stiffeners into place on the structural members.
- 18 2. Bolt Holes and Related Machining: Shop fabricate base plates, splices and flanges to
19 include bolt connection holes. Shop fabricated webs to include bracing holes.
- 20 3. Secondary structural connections (purlins and girts) to be ordinary bolted connections,
21 which may include welded clips.
- 22 4. Manufacturer is responsible for all welding inspection in accordance with the
23 manufacturer's IAS Accreditation or CAN/CSA A660 Certification. Special inspection by
24 the buyer or owner may be done in the manufacturer's facility and must be noted on the
25 Contract Documents.
- 26 5. Non-Destructive Testing (NDT) - NDT shall be performed and documented as required by
27 the governing building code for this project.

28 D. Zee Purlins:

- 29 1. Fabricate purlins from cold-formed "Z" sections with stiffened flanges. Size flange
30 stiffeners to comply with the requirements of the latest edition of AISI. Connection bolts
31 will install through the webs, not the flanges.

32 E. Girts:

- 33 1. Girts must be simple or continuous span as required by design. Connection bolts will
34 install through the webs, not the flanges.

35 F. Bracing:

- 1 1. Special Bracing: When diagonal bracing is not permitted in the sidewall, a rigid frame type
2 portal or fixed base column will be used. Shear walls can also be used where adequate to
3 resist the applied wind or seismic forces.
- 4 2. Flange Braces: The inside compression flange of all primary framing must be braced
5 laterally with angles connecting to the bottoms chords of joists or to the webs of
6 purlins/girts so that the flange compressive stress is within allowable limits for any
7 combination of loading.
- 8 3. Bridging: Laterally bridge the top and bottom chords of the open-web bar joists as required
9 by design thereof and specified on the building erection drawings.

- 10 G. Provide wall opening framing for doors, windows, and other accessory components.

11 **2.13 FABRICATION - GUTTERS AND DOWNSPOUTS**

- 12 A. Fabricate of same material and finish as roofing metal.
- 13 B. Form gutters and downspouts of profile and size indicated to collect and remove water.
14 Fabricate with connection pieces.
- 15 C. Form sections in maximum possible lengths. Hem exposed edges. Allow for expansion at
16 joints.
- 17 D. Fabricate support straps of same material and finish as roofing metal, color as selected.

18 **2.14 FINISHES**

- 19 A. Framing Members: Clean, prepare, and shop prime. Do not prime surfaces to be field welded.
- 20 B. Exterior Surfaces of Wall Components and Accessories: Precoated enamel on steel of modified
21 silicone finish, color as selected from manufacturer's standard range.
- 22 C. Interior Surfaces of Wall Components and Accessories: Precoated enamel on steel of modified
23 silicone finish, color as selected from manufacturer's standard range.

24 **PART 3 EXECUTION**

25 **3.01 EXAMINATION**

- 26 A. Verify that foundation, floor slab, mechanical and electrical utilities, and placed anchors are in
27 correct position

28 **3.02 ERECTION - FRAMING**

- 29 A. Erect framing in accordance with AISC 360.
- 30 B. Provide for erection and wind loads. Provide temporary bracing to maintain structure plumb
31 and in alignment until completion of erection and installation of permanent bracing. Locate
32 braced bays as indicated.
- 33 C. Set column base plates with non-shrink grout to achieve full plate bearing.
- 34 D. Do not field cut or alter structural members without approval.

1 E. After erection, prime welds, abrasions, and surfaces not shop primed.

2 **3.03 ERECTION - WALL AND ROOF PANELS**

3 A. Install in accordance with manufacturer's instructions.

4 B. Exercise care when cutting prefinished material to ensure cuttings do not remain on finish
5 surface.

6 C. Fasten cladding system to structural supports, aligned level and plumb.

7 D. Locate end laps over supports. End laps minimum 2 inches (50 mm). Place side laps over
8 bearing.

9 E. Provide expansion joints where indicated.

10 F. Use concealed fasteners.

11 G. Install sealant and gaskets, providing weather tight installation.

12 **3.04 ERECTION - GUTTERS AND DOWNSPOUTS**

13 A. Rigidly support and secure components. Join lengths with formed seams sealed watertight.
14 Flash and seal gutters to downspouts.

15 B. Connect downspouts to storm sewer system.

16 **3.05 INSTALLATION - ACCESSORY COMPONENTS IN WALL SYSTEM**

17 A. Install door frames, doors, overhead doors, and windows and glass in accordance with
18 manufacturer's instructions.

19 **3.06 TOLERANCES**

20 A. Framing Members: 1/4 inch (6 mm) from level; 1/8 inch (3 mm) from plumb.

21 B. Siding and Roofing: 1/8 inch (3 mm) from true position.

22 **END OF SECTION 133419**

1 **SECTION 412200 – CRANES AND HOISTS**

2 **PART 1 GENERAL**

3 **1.01 SECTION INCLUDES**

- 4 A. Cranes and hoisting equipment.

5 **1.02 CRANE SUMMARY**

- 6 A. Crane #1

- 7 1. Span: 35 feet, 0 inches
- 8 2. Capacity: 1 ton
- 9 3. Crane type: single girder
- 10 4. Classification: Crane shall be designed and constructed to CMAA Specification # 70 or #74,
11 as applicable, for Class "C" service requirements and operation in a non-hazardous
12 environment.
- 13 5. Crane speed: 16 FPM. Close headroom electric chain hoist and motorized trolley. Clearly
14 identify load rating on the equipment, visible from the floor.
- 15 6. Crane drive: Dual motor drive
- 16 7. Trolley speed: 65 FPM, VFD. Provide unit with AC or DC motor brakes, thermal overload
17 relays and mainline disconnects.
- 18 8. Trolley drive: Motorized
- 19 9. Hoist speed: Two speed
- 20 10. Hoist type: Chain hoist. Maximum duty and as appropriate for indicated capacity, sized to
21 reach floor.
- 22 11. Hoist motor:
- 23 a. 2.6 HP, 208V / 3-phase / 60A
- 24 b. Class F insulation
- 25 c. 30 minute hoist duty rated with 75° C rise over 90° C ambient temperature
- 26 d. TENV thermostats
- 27 12. Bottom blocks: 360° hook rotation. Safety latch. Yielding - fracture resistant hooks.
- 28 13. Control: Pendant from independent track on bridge
- 29 14. Gears: Case hardened. Drop forged or machine steel. Ductile iron gear case and
30 aluminum gear case cover. Fabricated steel gear case.
- 31 15. Clearances: A minimum clearance of three inches should be provided between the crane
32 and any lateral or overhead obstruction and two inches for lateral obstruction.

33 **1.03 PRICE AND PAYMENT PROCEDURES**

- 34 A. Alternates:

1 1. See Section 012300 - Alternates for product alternates affecting this section.

2 **1.04 REFERENCE STANDARDS**

3 A. Equipment furnished under this section shall, except as otherwise noted, comply in all respects
4 with the requirements of the following standards:

5 1. Occupational Safety and Health Administration

6 a. Part 1926.554 - Overhead Hoists

7 b. Part 1910.179 – Overhead and Gantry Cranes

8 2. *CMAA Crane Manufacturer’s Association of America

9 a. Specifications for Top Running Bridge & Gantry Type Multiple Girder Electric
10 Overhead Traveling Cranes - No. 70 (2015)

11 b. Specifications for Top Running and Under Running Single Girder Electric Overhead
12 Cranes Utilizing Under Running Trolley Hoist - No. 74 (2015)

13 3. American National Standards Institute / American Society of Mechanical Engineers

14 a. ANSI / ASME HST-4 - 2016 Performance Standard for Overhead Electric Wire Rope
15 Hoists

16 b. ANSI / ASME B30.16 – 2017 Overhead Underhung and Stationary Hoists

17 c. ANSI / ASME B30.2 - 2016 Overhead and Gantry Cranes (Top Running Bridge, Single
18 or Multiple Girder, Top Running Trolley Hoist)

19 d. ANSI / ASME B30.17 – 2015 Cranes and Monorails (with Underhung Trolley or
20 Bridge)

21 e. ANSI / ASME B30.30 – 2019 Ropes

22 4. National Electric Manufacturer’s Association

23 5. National Electric Code – 2017

24 a. Article 100, Article 240-1, Article 430-31, Article 430-51, Article 610-1, Article 610-31

25 b. Compliance to this standard is limited to the extent such standard is incorporated
26 into and made mandatory by OSHA regulations.

27 **1.05 SUBMITTALS**

28 A. See Section 013300 - Administrative Requirements for submittal procedures.

29 B. Product Data: Manufacturer's catalog data for hoist..

30 C. Shop Drawings: dimensional drawings and details for crane system.

31 D. Wiring Schematics

- 1 E. Manufacturer's qualification statement.
- 2 F. Testing agency's qualification statement.
- 3 G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project:
- 4 1. One set of Owner's manuals in paper and CD:
- 5 a. Equipment function, normal operating characteristics, and limiting conditions
- 6 b. Assembly, installation, alignment, and maintenance instructions
- 7 c. Lubrication and maintenance instructions.
- 8 d. Guide to "troubleshooting".
- 9 e. Parts list.
- 10 f. As-built drawing.
- 11 g. Test results.
- 12 2. See Section 016000 - Product Requirements for additional provisions.

13 **1.06 APPLICABLE STANDARDS**

- 14 A. Contractor shall adhere to OSHA, state, and local safety guidelines, laws, rules, and regulations.
- 15 B. Contractor shall conform to all applicable ANSI, CMAA, and HMI specifications and/or standards.
- 16 C. Comply with CMAA specification 74 or 70, as applicable.
- 17 D. Long lead items [hoist, end trucks, drives and controls] will be ordered by contractor upon
- 18 receipt of purchase order and credit approval. Steel will not be ordered until shop drawings and
- 19 submittals have been approved by the customer.
- 20 E. All electric equipment shall be UL, CSA c/us or ETL labeled.

21 **1.07 QUALITY ASSURANCE**

- 22 A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this
- 23 section, with at least five years of documented experience.
- 24 B. Testing Agency Qualifications: Independent firm specializing in performing testing and
- 25 inspections of type specified in this section.
- 26 C. Documents at Project Site: Maintain at project site one copy of manufacturer's instructions,
- 27 erection drawings, and shop drawings.

28 **1.08 DELIVERY, STORAGE, AND HANDLING**

- 29 A. See Section 017400 – Cleaning and Waste Management for packaging waste requirements.

1.09 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide 1-year manufacturer warranty against failure due to defective material or workmanship commencing on the date of Substantial Completion. Complete forms in Owner's name and register with manufacturer.
- C. Installer Warranty: Provide 1-year warranty against failure due to defective workmanship commencing on the Date of Substantial Completion. Complete forms in Owner's name and register with installer.

PART 2 PRODUCTS**2.01 MANUFACTURERS**

- A. Bridge Crane:
 - 1. Basis of design: Crane-Tec
- B. Hoist:
 - 1. Basis of design: R&M Materials Handling, Inc.
- C. Substitutions: See Section 016000 - Product Requirements.

2.02 EQUIPMENT

- A. Hoist and Trolley
 - 1. Basis of design: R&M LK Chain Hoist with standard features
 - 2. The hoist shall be equipped with an electro-mechanical load-limiting device that shall prevent lifting more than 110% of the rated load.
 - 3. Hoist and trolley motors shall be per 1.01B above, as applicable.
 - 4. Hoisting motor(s) shall be two-speed/two winding squirrel cage type with a speed ratio of 6:1.
 - 5. Hoisting motor(s) shall be totally enclosed with IP55 protection, minimum class F insulation, Klixon type bimetal switch for thermal protection and shall have a 60% ED rating.
 - 6. Trolley shall be furnished with an adjustable frequency inverter drive and two-step or infinitely variable speed control for smooth acceleration and deceleration.
 - 7. Trolley motors shall be inverter duty motors with minimum class "F" insulation and motor enclosures shall be TENV [totally enclosed non-ventilated].
 - 8. Rotary cam type limit switch equipped with 4 micro-switches shall be provided. Limit switch shall provide upper and lower limit of hoist travel, hoist slow down prior to reaching upper limit and phase sequence supervision at upper limit. An additional block operated limit shall be included.

- 1 9. Hoist motor brake shall be DC disc type with adequate torque to stop and hold over **125%**
2 of the hoist rated load.
- 3 10. Large diameter rope drum with a minimum of 36:1 drum to wire rope diameter
4 ratio. Groove depth shall be at least 35% of rope diameter. The rope drum shall be
5 equipped with a rope guide to help keep the rope aligned in the grooves of the drum.
- 6 11. Wire rope shall be constructed from galvanized steel having a minimum safety factor of 5.
- 7 12. Hoist reeving shall be single reeved. Lateral hook drift shall not exceed 1/8 inch per foot
8 of vertical travel on single reeved models.
- 9 13. The hoist nameplate is to carry a CSA c/us rating. The actual hoist control enclosure rating
10 shall be at least equivalent to IP55 / NEMA 4 type.
- 11 14. Hooks shall be made of forged alloy steel (34CrMo4QT or 34CrNiMo6QT) and shall be
12 fitted with a spring-loaded flipper-type safety latch.
- 13 15. Hoist shall have a duty rating suitable for the load class and load cycles of the application
14 (reference appendix A).
- 15 16. AGMA quality class 12 machine cut, hardened and precision ground hoist gearing. The
16 gears inside the hoist gearboxes on models up to 5 ton capacity are lubricated by semi-
17 fluid grease. On models over 5 ton capacity the gears inside the hoist gearbox are
18 lubricated with semi-fluid grease or oil.
- 19 17. AGMA quality class 10, hardened and precision ground trolley drive gearing, lubricated by
20 semi-fluid grease.
- 21 18. Trolleys shall have safety drop lugs and energy absorbing bumpers.

22 B. Bridge Girder

- 23 1. Bridge girder shall be per 1.01B above, as applicable.
- 24 2. Bridge girders shall be constructed from welded box girders or Structural beams, Steel,
25 ASTM A36 or A992, as required.

26 C. Power Supply

- 27 1. Power supply for the hoist shall be 208 volt, 3 ph., 60 Hz. All power required for the
28 operation of the hoist, and trolley shall be developed from this source.
- 29 2. Runway electrification shall be 4-bar safety type rigid conductors as manufactured by
30 Insul-8, Duct-O-Wire Company or Wampfler. Wall mounted disconnect switch and power
31 to runway conductors provided by Electrical Contractor.
- 32 3. Cross bridge electrification shall be flat cable style festoon system with terminal box,
33 multi-conductor cord, plug connectors (when available) and accessories. Cables are to be
34 hardwired when plug connectors are not available.

35 D. Controls

- 36 1. Six-way operation, plug-in pushbutton pendant suspended from independent festoon
37 track.
- 38 2. Pendant shall include Start (momentary) button and Emergency Stop (push to maintain,
39 turn to release) that controls a mainline contactor in the bridge control panel.
- 40 3. Pushbutton shall be clearly marked with hoist and trolley travel directions.

- 1 4. Hoist shall be 2 speed magnetic reversing type (standard) and the trolley controls shall be
2 variable frequency inverter control (standard), as required per section 1.01.B.
3 5. Electrical control enclosures shall be IP55 or NEMA 4 type. Pushbutton enclosure shall
4 have a rating of IP65, NEMA 4X, 4 or 5.

5 E. Labeling

- 6 1. Hoist and bridge beam shall be labeled with load rating.
7 2. A corrosion-resistant nameplate shall be fixed to the bridge with the following
8 information:
9 a. Name of manufacturer
10 b. Mfg.'s model number and serial number
11 c. Capacity
12 d. Date of manufacture (month and year)

13 F. Painting

- 14 1. Hoist and trolley shall be factory painted (2-part epoxy) per manufacturer's standards.
15 2. Bridge shall be shop cleaned, primed, and painted per manufacturer's standards.
16 3. The following items shall not be painted:
17 a. Rail surfaces in contact with wheels
18 b. Wheel running surfaces
19 c. Hoist chain
20 d. Conductor bar, festoon cables and supports

21 **2.03 MATERIALS**

- 22 A. Bridge beams: Steel, ASTM A36 or A992.
23 B. Trolley: Steel, ASTM A36 (or equal)
24 C. Wheels: Cast iron or steel
25 D. Hooks: Forged steel

26 **PART 3 EXECUTION**

27 **3.01 INSTALLATION**

- 28 A. Install in accordance with manufacturer's written instructions.
29 B. Inspect structure and crane rail erection for conformance with reviewed shop drawings and
30 contract documents prior to installation of equipment. Bring nonconforming work to the
31 attention of the customer prior to proceeding with crane installation. Non-conforming runway
32 structure or installation must be corrected prior to load testing of crane system.

- 1 C. Crane shall be installed in conformance with manufacturer's instructions and inspected by a
2 manufacturer's representative. Provide all necessary accessories to make crane complete,
3 usable, and capable of meeting the operating requirements specified in the Operating
4 Requirements. Test, adjust and clean equipment for acceptance by Owner.

5 **3.02 TESTING**

- 6 A. All crane equipment shall be operated through a complete lift and lowering cycle and through a
7 complete travel of the bridge and trolley to determine that the equipment shall perform
8 smoothly and safely and that pendant cable length is sufficient to permit operation from desired
9 floor levels. All tests shall be carried out with the bridge crane equipment loaded at 125 percent
10 of capacity. The crane provider shall provide the test weight loads. Any defects shall be
11 corrected by the crane provider without any expense to the Owner.

12 **3.03 CLEANING**

- 13 A. See Section 017300 – Execution and Section 017700 – Closeout Requirements for additional
14 requirements.
- 15 B. Upon completion of work, area shall be cleaned and restored to original condition, acceptable to
16 the Owner.

17 **3.04 CLOSEOUT ACTIVITIES**

- 18 A. See Section 017800 - Closeout Submittals for additional submittals.
- 19 B. Demonstrate proper operation of equipment to Owner's designated representative.
- 20 C. Training: Train Owner's personnel on operation and maintenance of system.
- 21 1. Training Reference: Operation and maintenance manual and additional training materials
22 as required.
- 23 2. Provide minimum of two hours of training.

24 **END OF SECTION 412200**

Addendum

6534 Constitution Drive
Fort Wayne, IN 46804
(260) 436-9213
fax (260) 432-5481

ADDENDA NO. 1
DATE: March 10, 2022
PROJECT: Centerville-Abington Transportation Building
COMMISSION NO. **SCO** Engineering, LLC – 212600

The Contractor shall incorporate, into the Contract Documents and into his bid, the following changes and/or clarifications to the Drawings, Specifications and Scope of Work.

PLUMBING

Specifications

1. Section 221319.13 – Sanitary Drains
Revise paragraph 2.4, A., 1., a. to read “Dura Trench”
Add paragraph 2.4, A., 1., b. to read “Josam Company”
Add paragraph 2.4, A., 1., c. to read “Jay R. Smith Mfg. Co.”
Add paragraph 2.4, A., 1., d. to read “Zurn Industries, LLC.”

Sheet P6.1

1. Revise Fixture TD-1 manufacturer to read: “DURA TRENCH”, fixture model to read: “DTPF12” on the plumbing fixture schedule.
2. Revise Note #36 on the plumbing fixture schedule to read: “PROVIDE AND INSTALL WITH 14” WIDE CAST IRON ADA/HEEL PROOF SLOTTED GRATE, HEAVY DUTY GALVANIZED STEEL FRAME AND GRATE LOCKS, AND 4” BOTTOM OUTLET.”

Sheet P6.1

1. Revise Fixture TD-1 manufacturer to read: “DURA TRENCH”, fixture model to read: “DTPF12” on the plumbing fixture schedule.

ELECTRICAL

Sheet E3.2

1. Delete existing drawing 2600E3.2 and replace with the attached revised 2600E3.2, for information on the hoist electrical termination.

END OF ADDENDA NO. 1

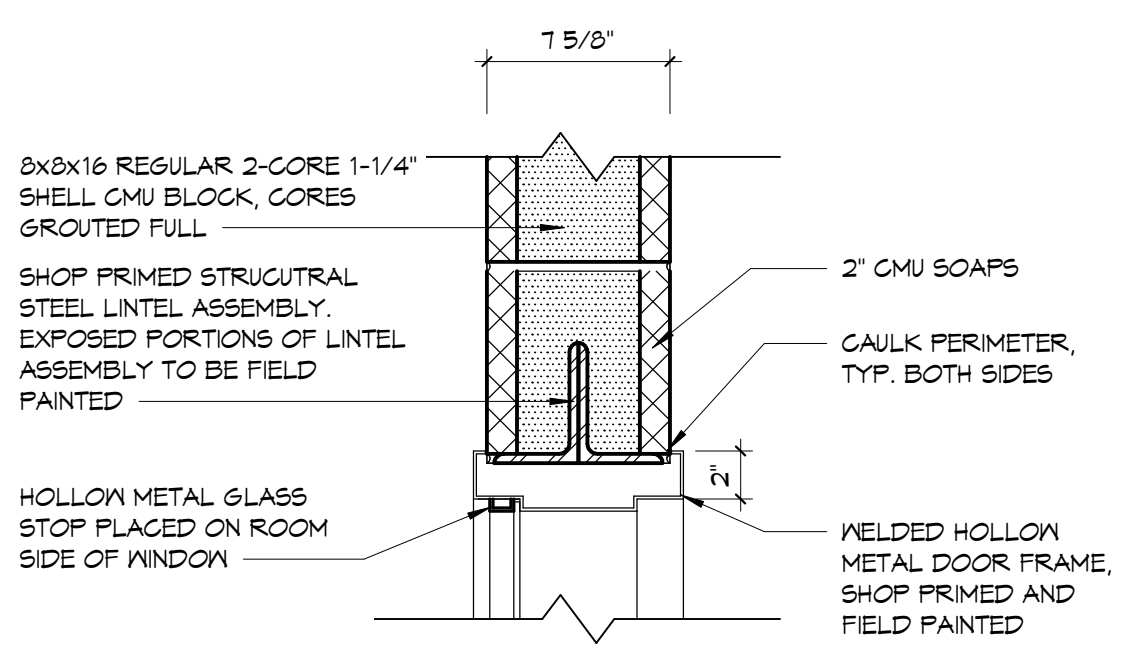
DOOR NUMBER	DOOR SLAB					DOOR FRAME					GLAZING	RATING	HARDWARE SET	ELECTRICAL REQ'D	REMARKS	
	WIDTH	HEIGHT	THICKNESS	ELEVATION	MATERIAL	ELEVATION	MATERIAL	HEAD	JAMB	SILL						DEPTH
100	3'-0"	7'-0"	2 1/4"	AL1	ALUM	2	ALUM	3/A4.10	2/A4.10	1/A4.10	4 1/2"	1" INSUL	0	1	Yes	
101	3'-0"	7'-0"	1 3/4"	AL1	ALUM	2	ALUM	3/A4.10	4/A4.10		4 1/2"	1/4" TEMP	0	2		
102a	3'-0"	7'-0"	1 3/4"	NV	HM	1	HM	10/A4.10	9/A4.10		8 3/4"	1/4" TEMP	0	3		
102b	3'-0"	7'-0"	1 3/4"	NV	HM	1	HM	10/A4.10	9/A4.10		8 3/4"	1/4" TEMP	0	4		
103	3'-0"	7'-0"	1 3/4"	F	HM	1	HM	10/A4.10	9/A4.10		6 3/4"	-	0	5		
104	3'-0"	7'-0"	1 3/4"	NV	HM	1	HM	10/A4.10	9/A4.10		8 3/4"	1/4" TEMP	0	6		
105	3'-0"	7'-0"	1 3/4"	F	HM	1	HM	10/A4.10	9/A4.10		6 3/4"	-	0	7		
109	6'-0"	7'-0"	1 3/4"	F	HM	1	HM	10/A4.10	9/A4.10		8 3/4"	-	0	5		DOUBLE DOOR.
111a	12'-6"	14'-0"	2"	SOD	ISTL	0	STL	3/A4.10	7/A4.10	6/A4.10	2"	1/2" INSUL	0	11		
111b	3'-0"	7'-0"	1 3/4"	F	HMIG	1	HMIG	12/A4.10	11/A4.10	6/A4.10	8 3/4"	-	0	8		
111c	12'-6"	14'-0"	2"	SOD	ISTL	0	STL	3/A4.10	7/A4.10	6/A4.10	2"	1/2" INSUL	0	11		
111d	12'-6"	14'-0"	2"	SOD	ISTL	0	STL	3/A4.10	7/A4.10	6/A4.10	2"	1/2" INSUL	0	11		
111e	3'-0"	7'-0"	1 3/4"	F	HMIG	1	HMIG	12/A4.10	11/A4.10	6/A4.10	8 3/4"	-	0	8		
111f	12'-6"	14'-0"	2"	SOD	ISTL	0	STL	3/A4.10	7/A4.10	6/A4.10	2"	1/2" INSUL	0	11		
112	3'-0"	7'-0"	1 3/4"	F	HM	1	HM	10/A4.10	9/A4.10		8 3/4"	-	0	9		
202	3'-0"	7'-0"	1 3/4"	F	HM	1	HM	10/A4.10	9/A4.10		8 3/4"	-	0	10		
203	3'-0"	7'-0"	1 3/4"	F	HM	1	HM	10/A4.10	9/A4.10		8 3/4"	-	0	10		

ISTL= INSULATED STEEL DOOR
L= LOUVER DOOR
NV= NARROW VISION GLASS
OPM= OPERABLE PARTITION WALL
RC= ROLLING COUNTER
RG= ROLLING GRILLE
SCAD= SOLID CORE WOOD DOOR
SS= STAINLESS STEEL

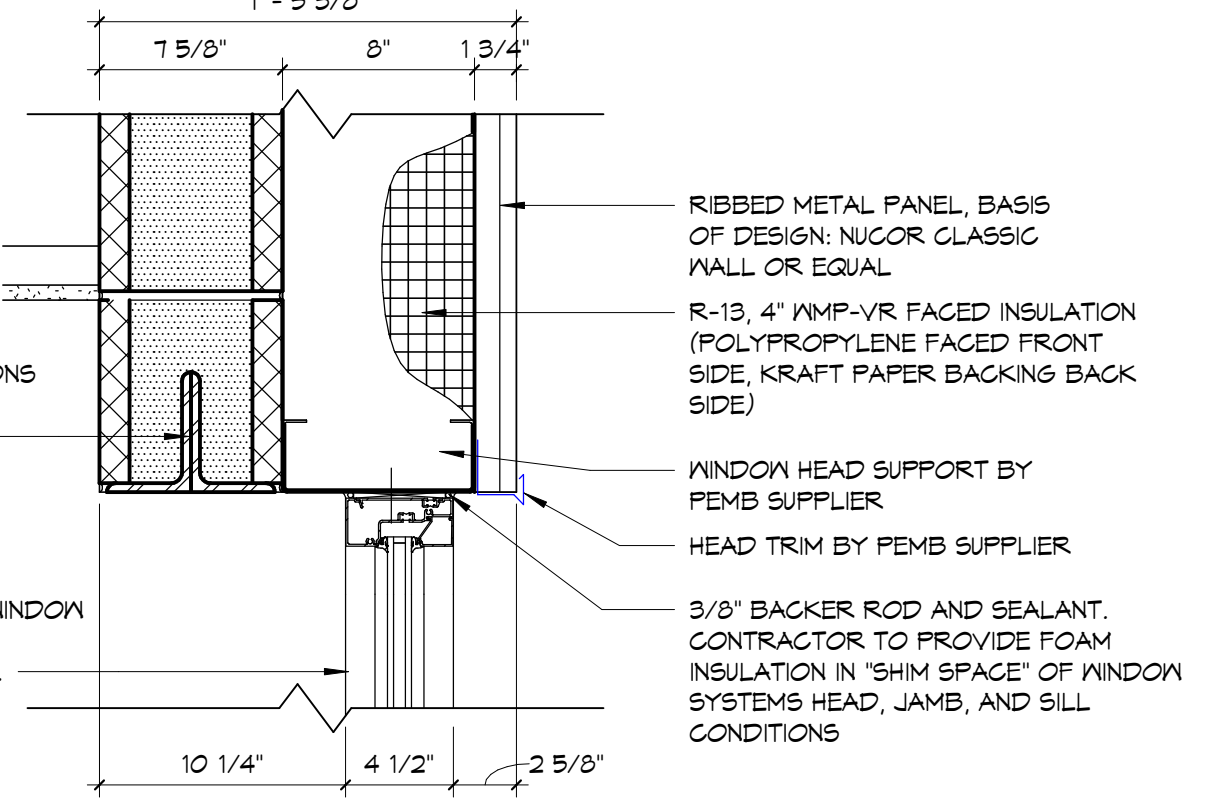
AC= ACCORDIAN DOOR
ALUM= ALUMINUM
COD= COILING OVERHEAD
DL= DOUBLE LOUVER
F= FLUSH DOOR
FG= FULL GLASS
HG= HALF GLASS
HM= HOLLOW METAL
HMIG= HOLLOW METAL GALV.
HMIG= HOLLOW METAL INSUL. GALV.



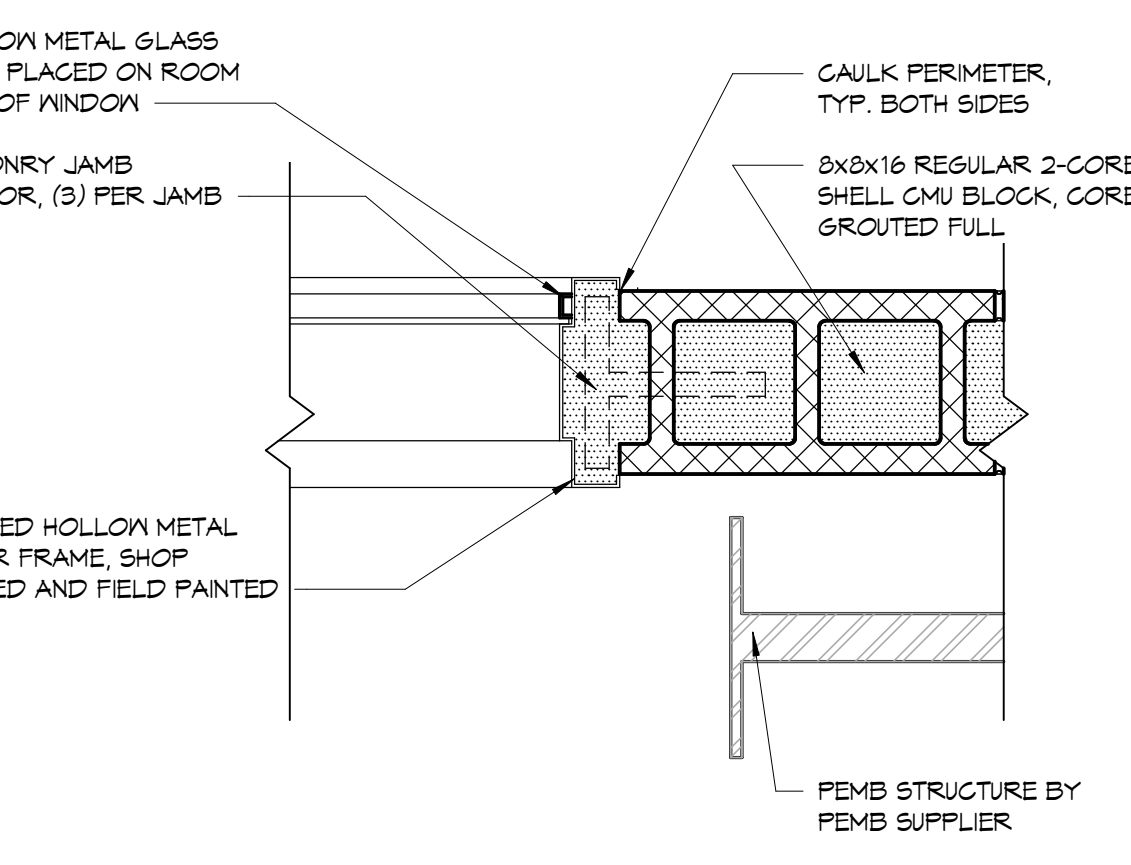
CENTERVILLE-ABINGTON COMMUNITY SCHOOLS TRANSPORTATION BUILDING



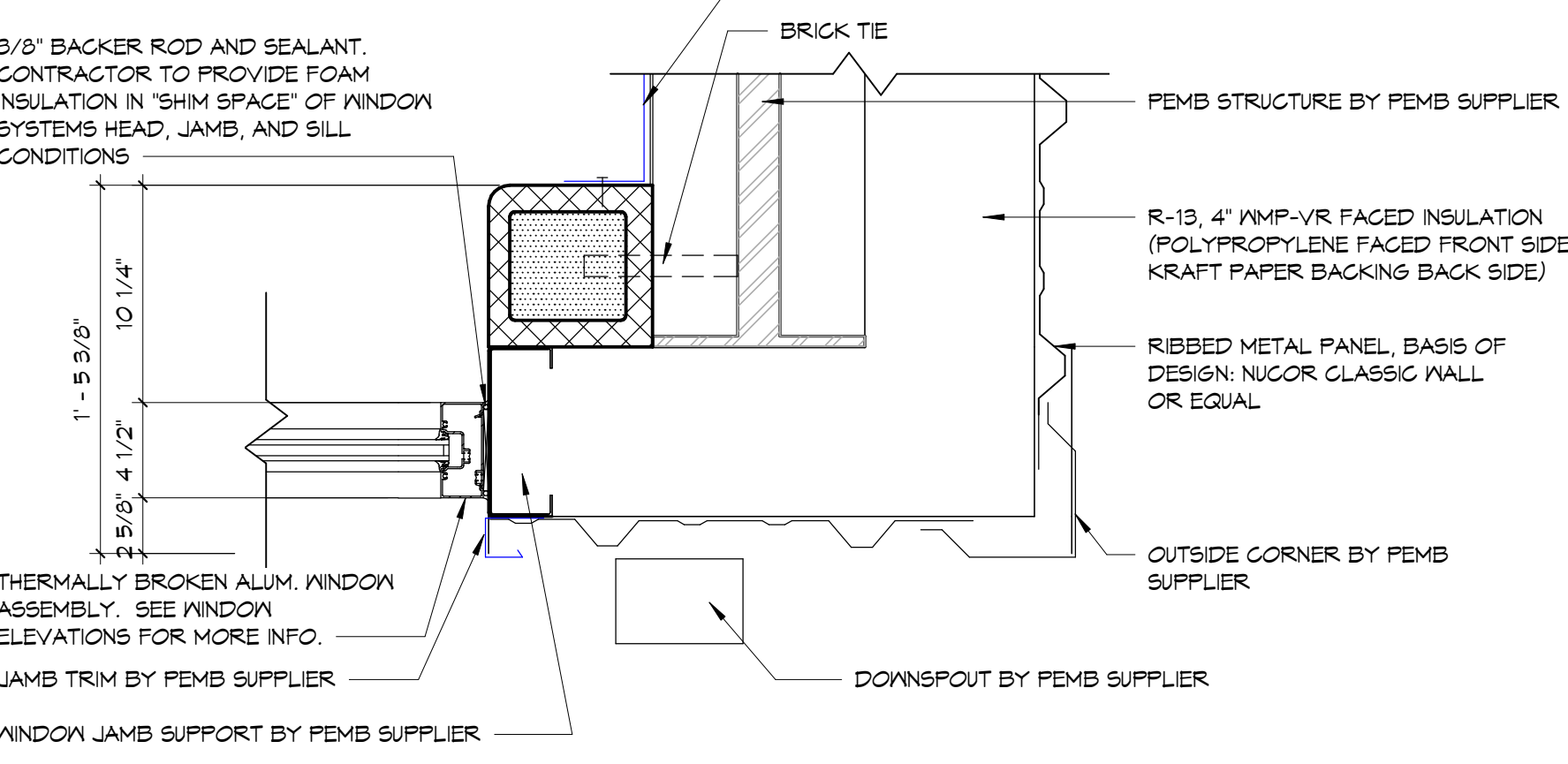
6 Head Detail
1 1/2" = 1'-0"



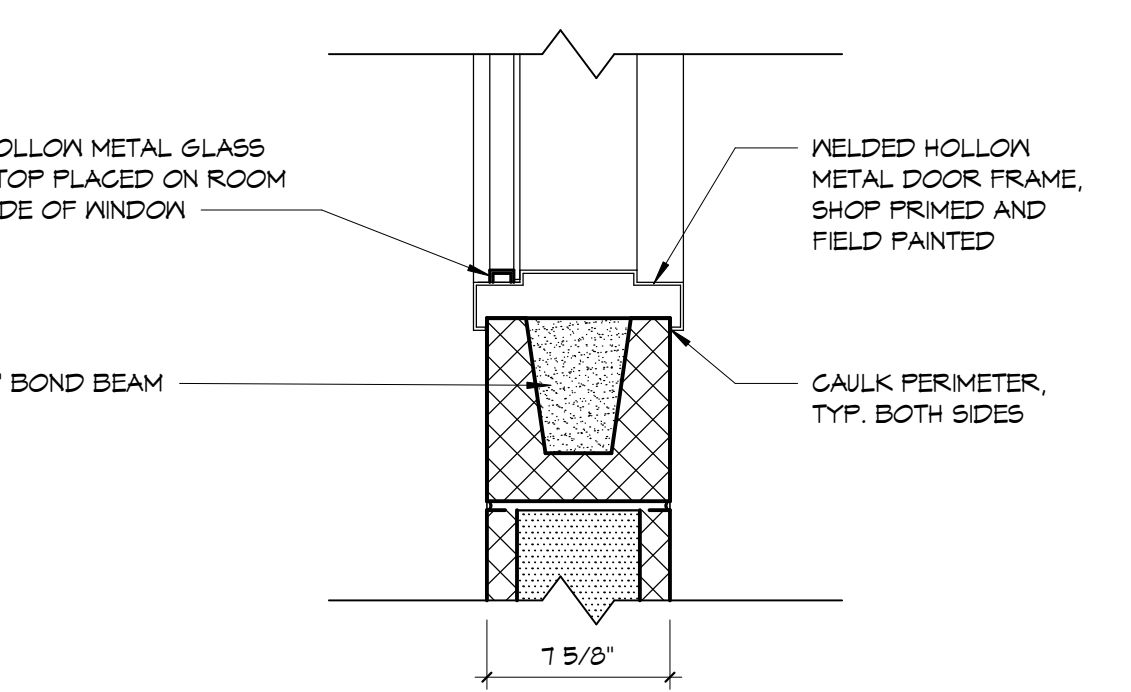
3 Head Detail
1 1/2" = 1'-0"



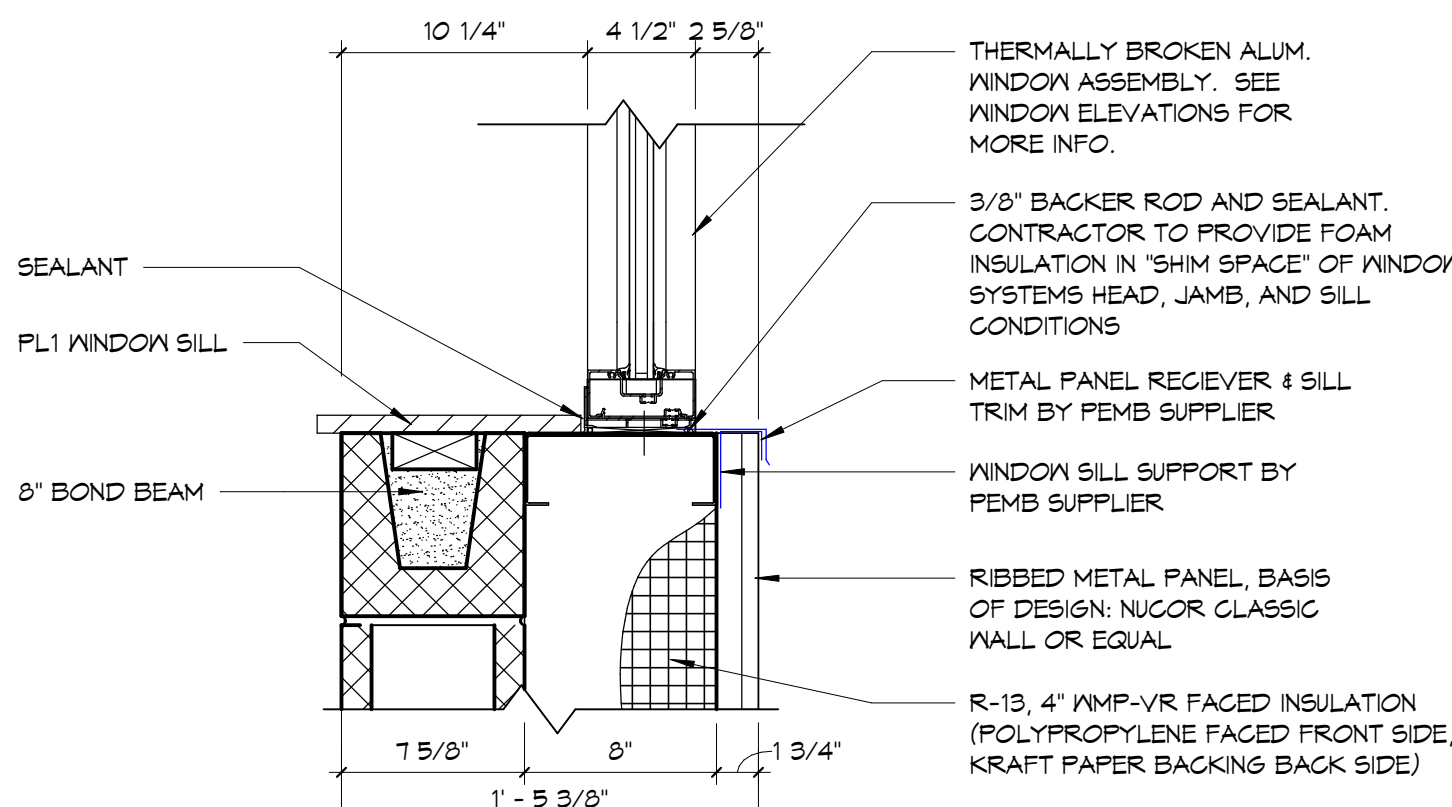
5 Jamb Detail
1 1/2" = 1'-0"



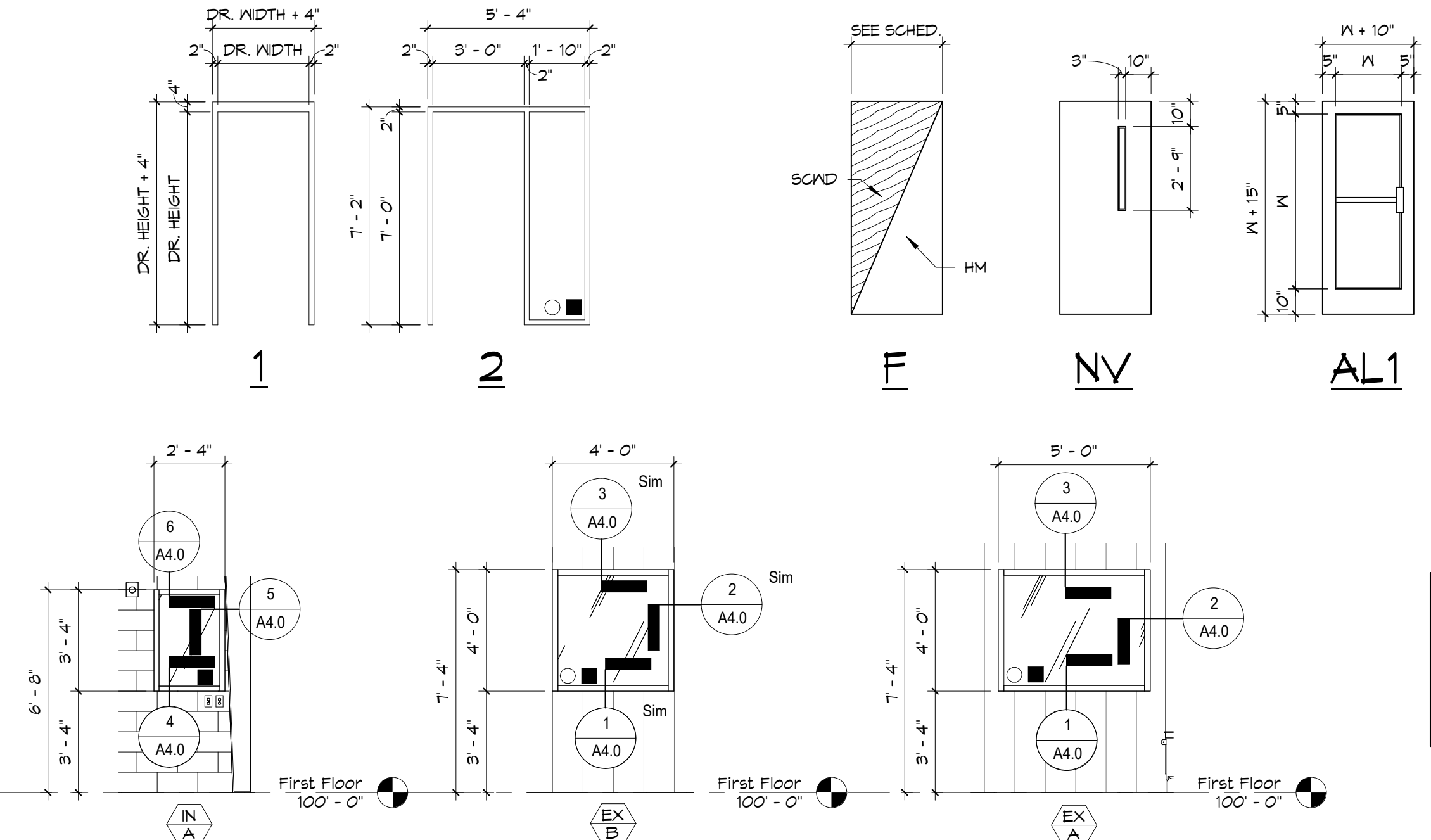
2 Jamb Detail
1 1/2" = 1'-0"



4 Sill Detail
1 1/2" = 1'-0"



1 Sill Detail
1 1/2" = 1'-0"



Glazing Legend

- 1/4" CLEAR TEMPERED SAFETY GLASS
- 1" LOW-E INSULATED GLAZING CONSISTING OF 1/4" TINTED, TEMPERED OUTSIDE LITE AND 1/4" CLEAR, TEMPERED INSIDE LITE w/ SOFT-COAT, LOW-E FILM AND 1/2" AIR SPACE

NOTE: BORROWED LIGHT / INTERIOR WINDOW SYSTEM TO HAVE GLASS STOPS INSTALLED ON OPPOSITE SIDE OF CORRIDOR.

A PROJECT FOR:



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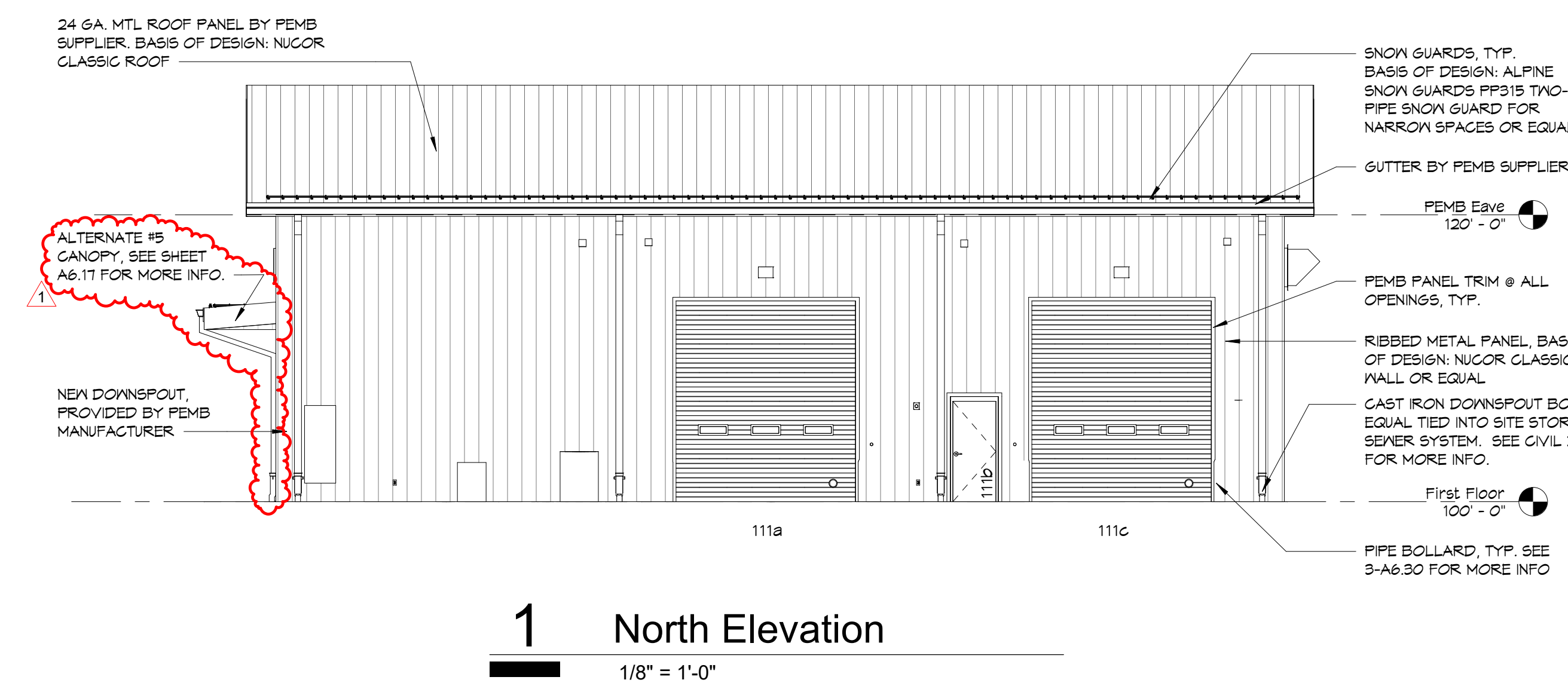
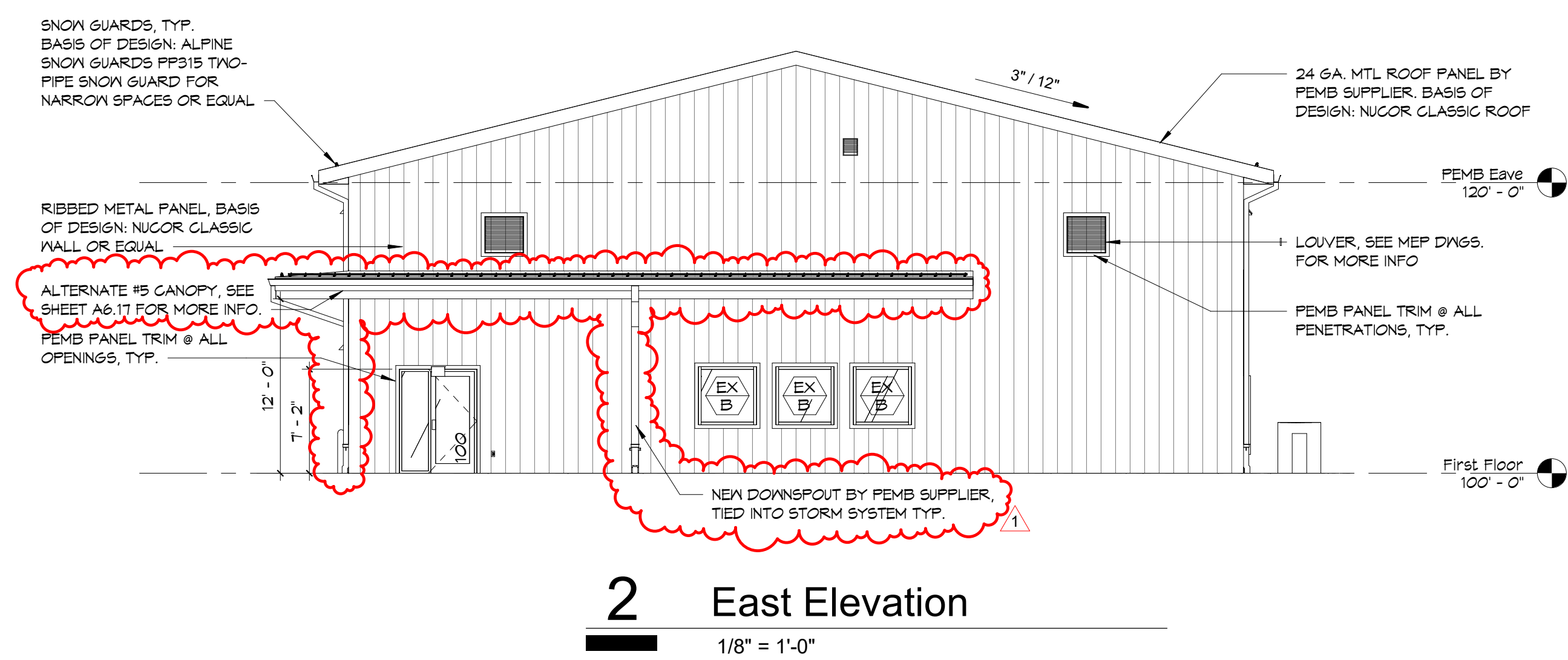
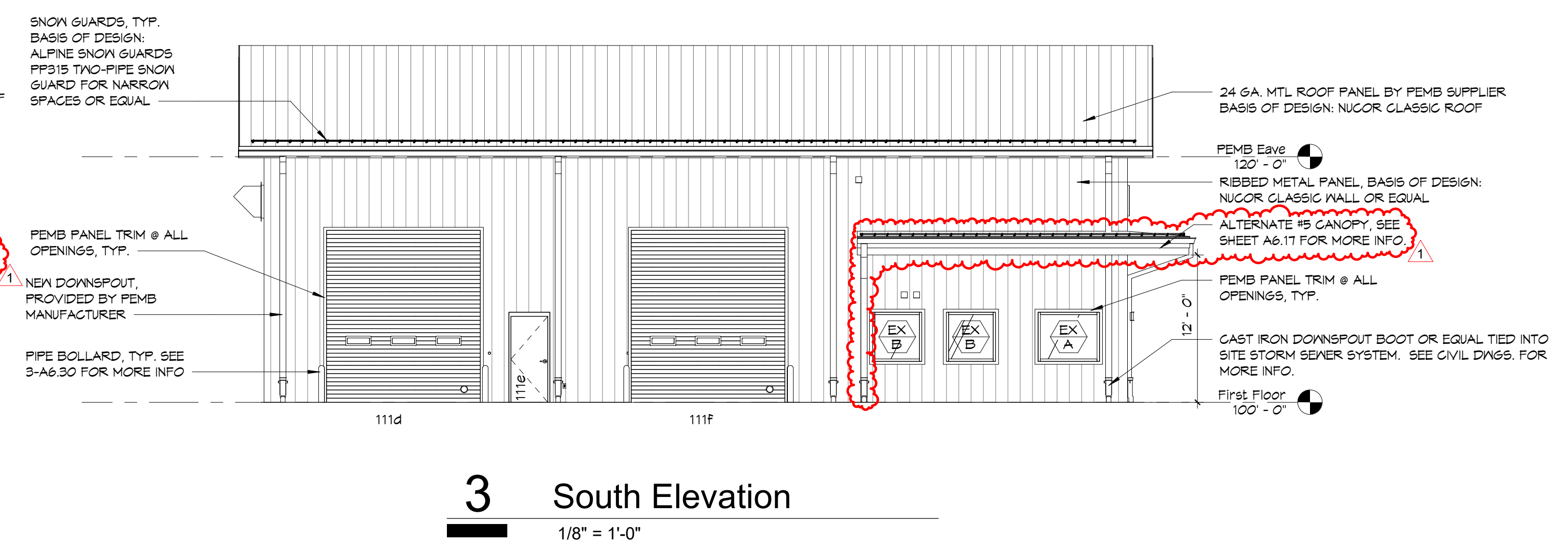
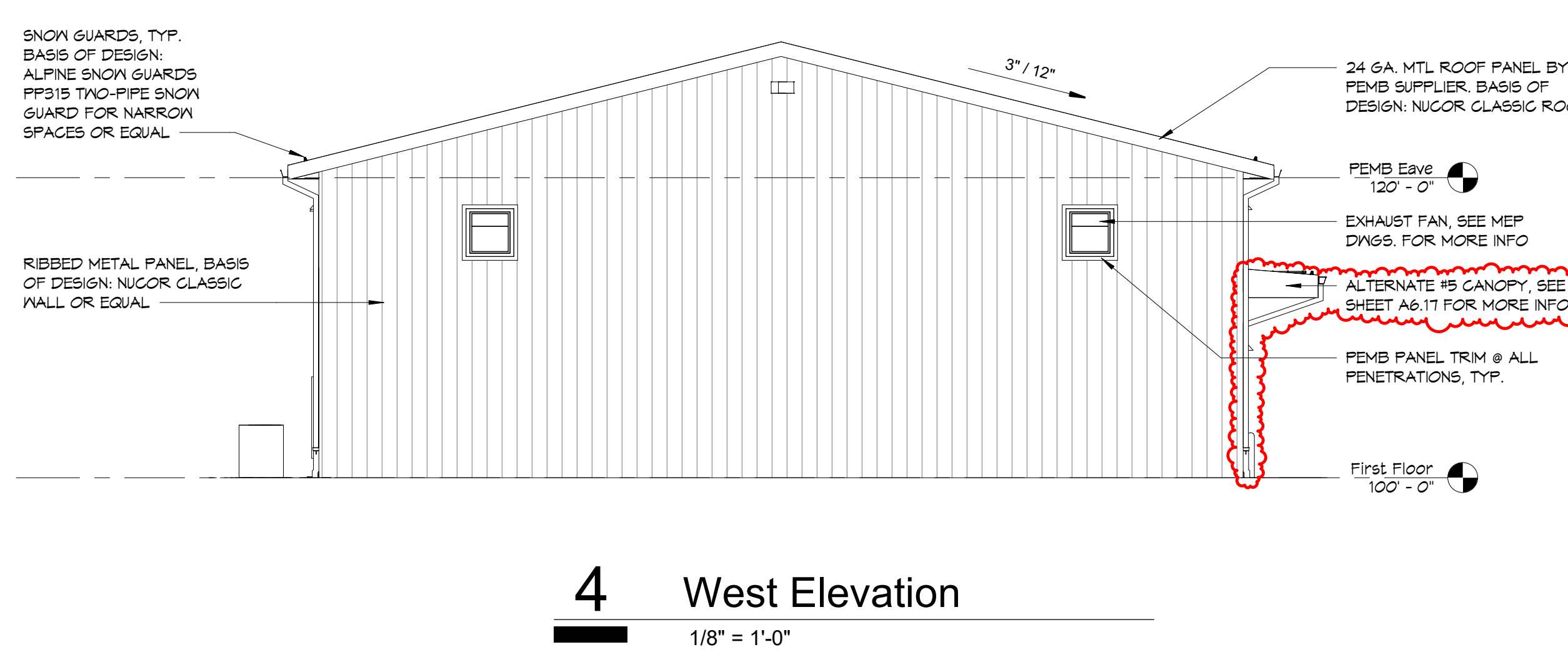
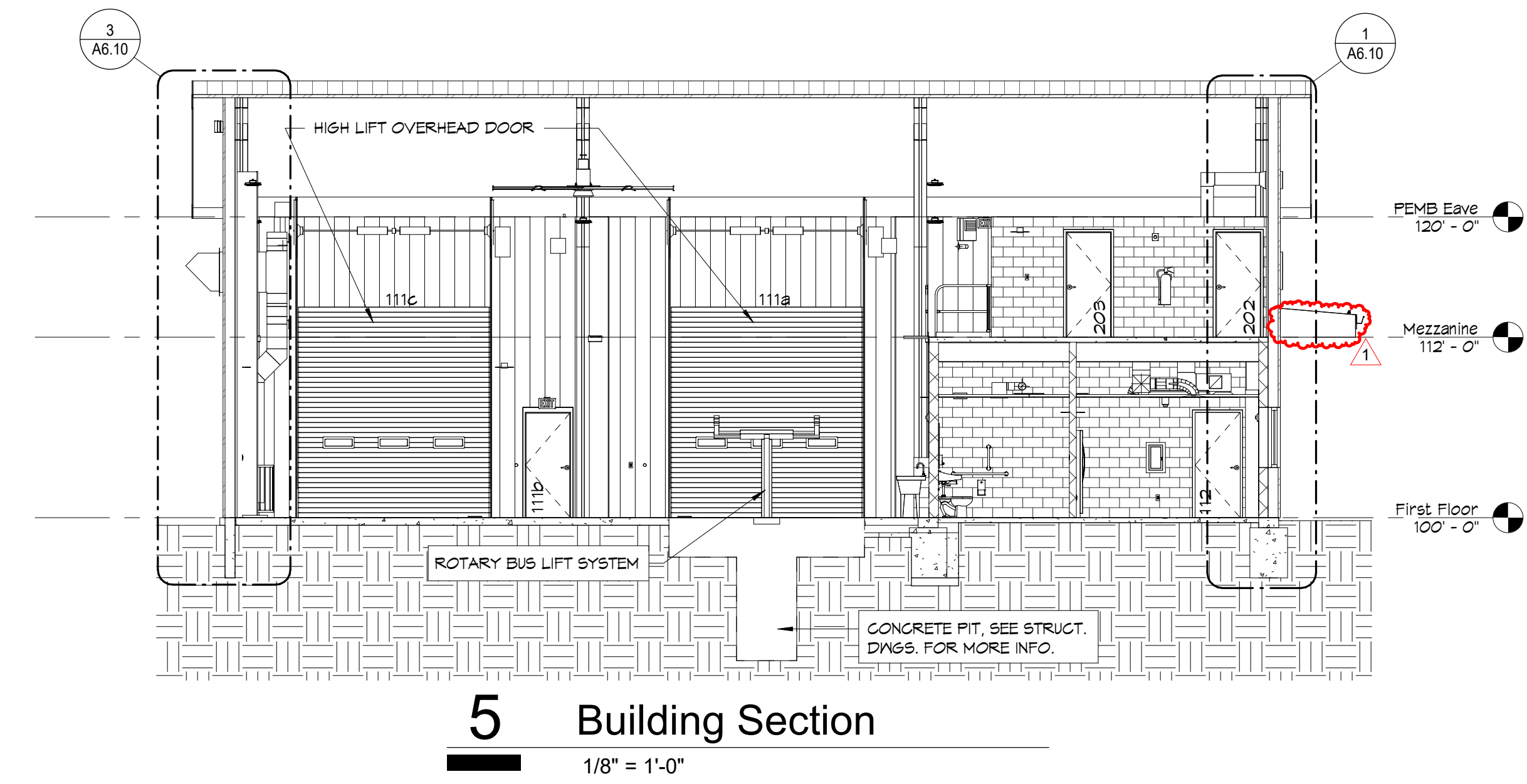
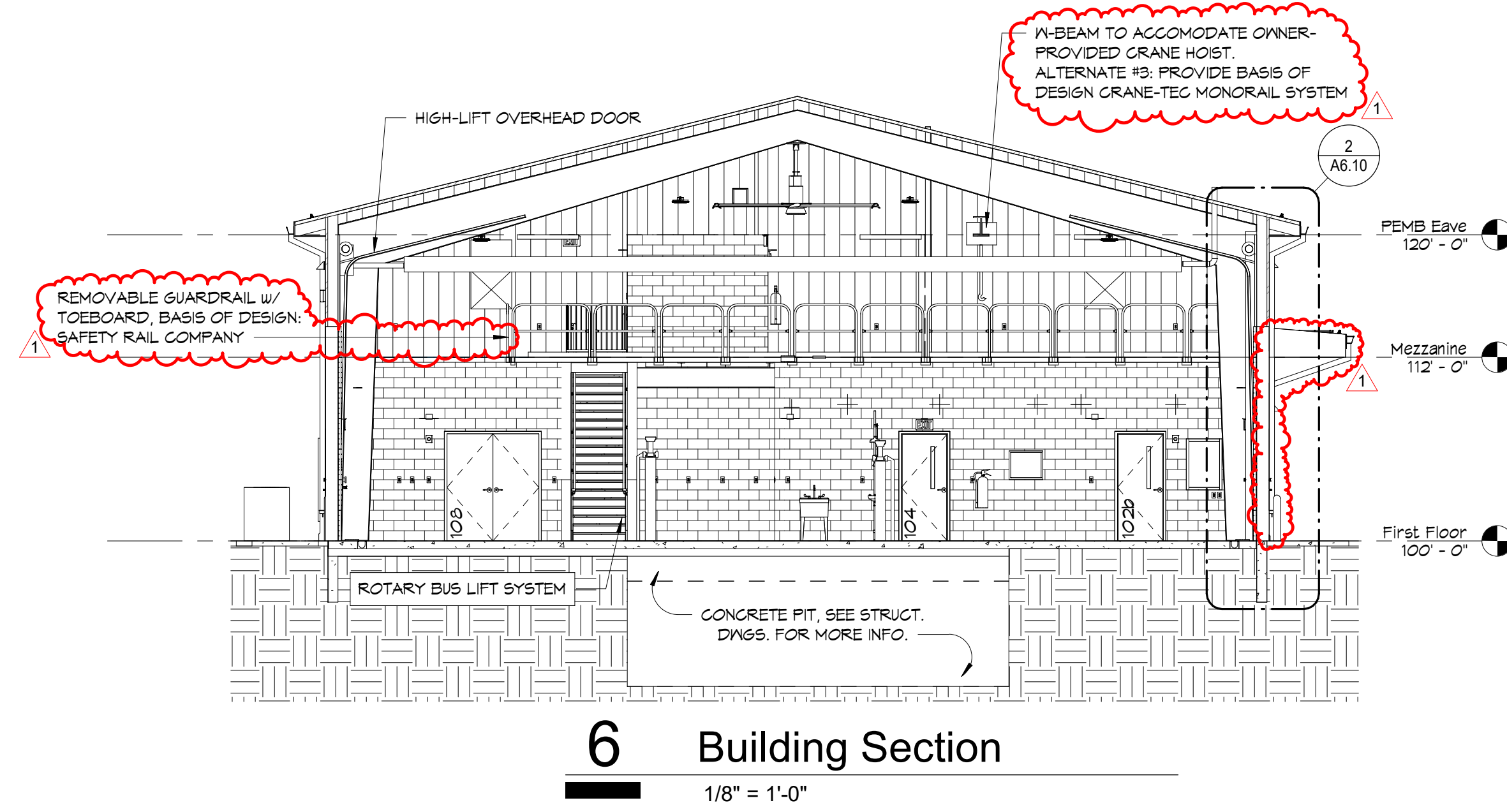
mark	date	description
1	3/10/2022	Addendum 1

Door & Window Schedule and Details

date: March 2, 2022
project: 473003
coordinator: JMO
drawn: LNG
checked: CDH



**CENTERVILLE-ABINGTON COMMUNITY SCHOOLS
TRANSPORTATION BUILDING**



A PROJECT FOR:



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mark	date	description
1	3/10/2022	Addendum 1

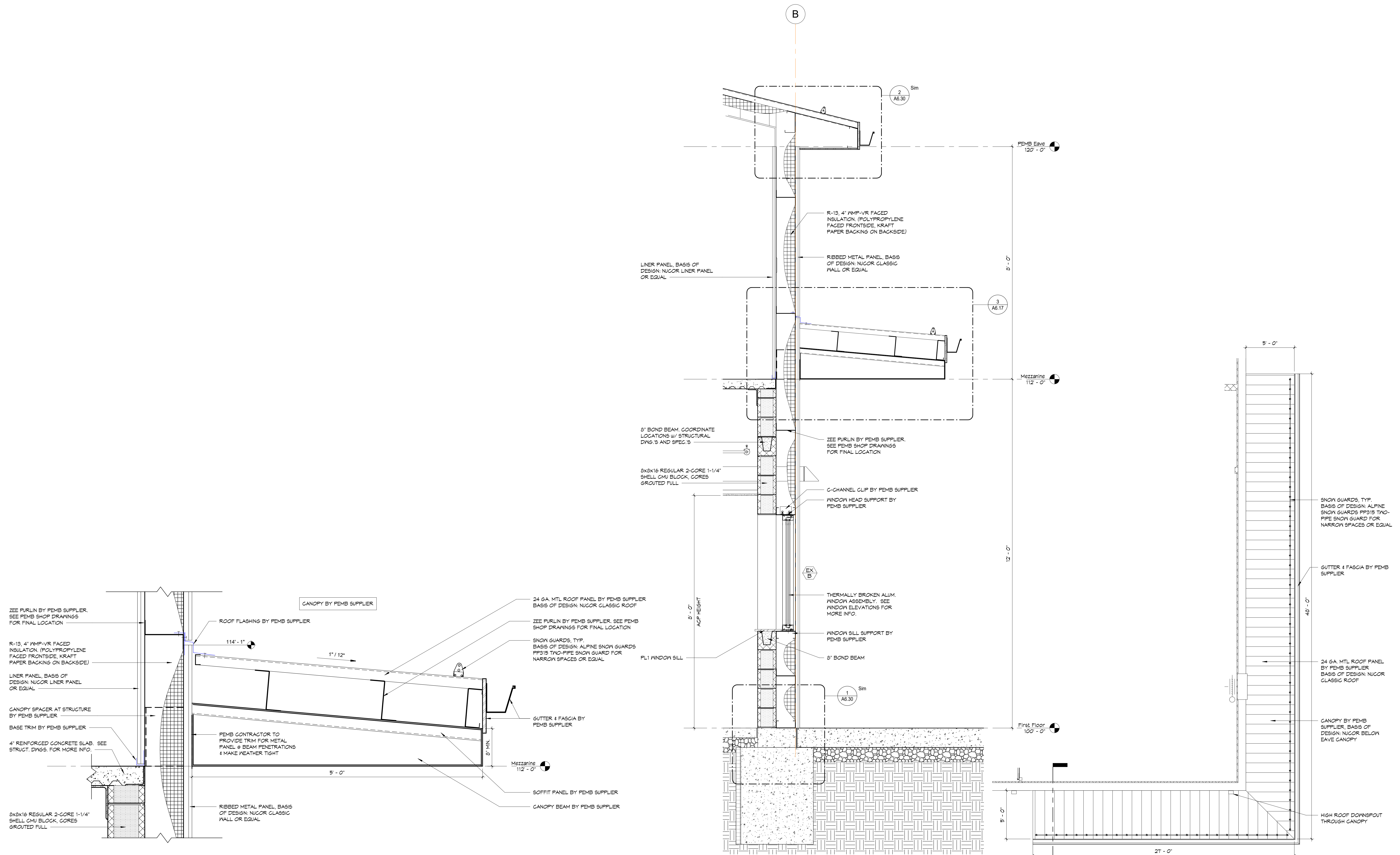
**Overall Reference
Building Elevations and
Sections**

date: March 2, 2022
project: 473003
coordinator: JMO
drawn: LNG
checked: CDH

A5.0



**CENTERVILLE-ABINGTON COMMUNITY SCHOOLS
TRANSPORTATION BUILDING**



3 Enlarged Canopy Section
1 1/2" = 1'-0"

2 Wall Section Thru Canopy
3/4" = 1'-0"

1 Alternate #5 Canopy Plan
1/4" = 1'-0"

A PROJECT FOR:



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mark	date	description
1	3/10/2022	Addendum 1

Alternate #5 Canopy Plan, Sections, and Details

date: March 2, 2022
project: 473003
coordinator: JMO
drawn: LNG
checked: CDH

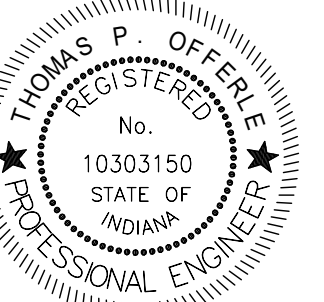
A6.17

ELECTRICAL PLAN NOTES

- ① EQUIPMENT IS PROVIDED AND INSTALLED BY ANOTHER CONTRACTOR. ELECTRICAL CONTRACTOR SHALL REFER TO ARCHITECTURAL, CIVIL, STRUCTURAL, MECHANICAL AND PLUMBING DRAWING SHEETS TO COORDINATE THE EXACT LOCATION OF EQUIPMENT WITH EQUIPMENT PROVIDER. ELECTRICAL CONTRACTOR SHALL TERMINATE EQUIPMENT AS REQUIRED. WHERE NO STARTERS, DISCONNECTS, OR SWITCHES ARE INDICATED, THEY WILL BE FACTORY MOUNTED AND LOAD-SIDE WIRED.
- ② ELECTRICAL CONTRACTOR SHALL REFER TO DRAWING 'E3.1' FOR CONTINUATION.
- ③ ELECTRICAL CONTRACTOR SHALL COORDINATE RH-1-2-3 TERMINATION POINTS WITH MECHANICAL CONTRACTOR. TERMINATE FOR A COMPLETE FUNCTIONAL SYSTEM.
- ④ CRANERHOIST: ELECTRICAL CONTRACTOR SHALL TERMINATE CRANE MOTOR AS SPECIFIED BY MANUFACTURERS RECOMMENDATIONS. TERMINATE TO CIRCUIT AS SHOWN. COORDINATE FINAL LOCATIONS WITH CRANE INSTALLER AND CONSTRUCTION MANAGER AS REQUIRED TO PROVIDE A FULLY FUNCTIONAL SYSTEM.

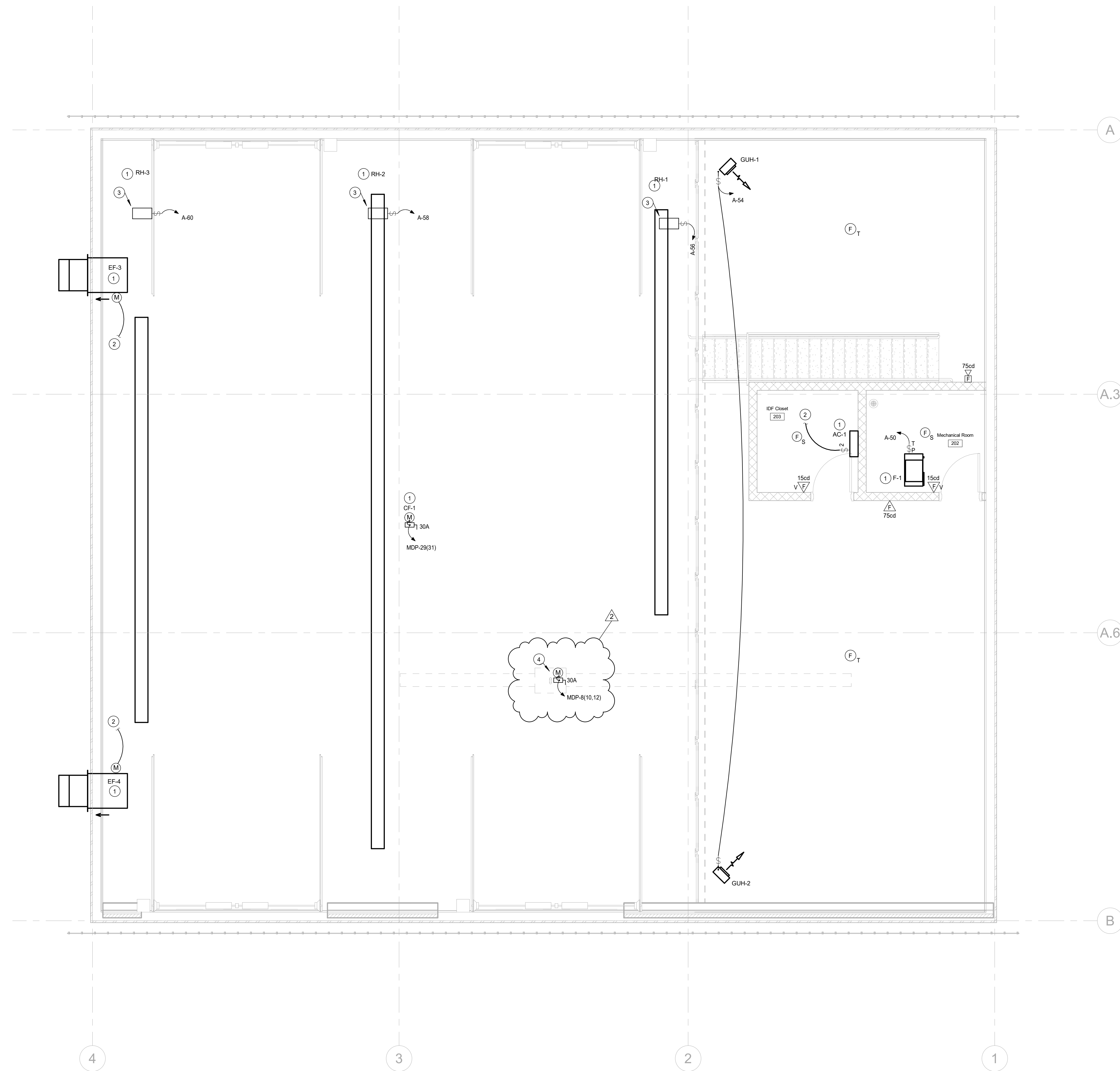
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Hoffmann

**CENTERVILLE-ABINGTON COMMUNITY SCHOOLS
TRANSPORTATION BUILDING**



SECOND FLOOR ELECTRICAL SYSTEMS PLAN
SCALE: 1" = 8'

A PROJECT FOR:



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mark	date	description
2	03-10-22	Addendum 1

Second Floor Electrical Systems Plan

date: March 2, 2022
project: 487001 (212600)
coordinator: J.M.
drawn: SJB
checked: TPO

E3.2