



**CDB #630-036-008**

**CONSTRUCT SALT STORAGE BUILDING – BRIDGING DOCUMENTS  
NEW LENOX MAINTENANCE FACILITY – DISTRICT 1  
1400 WEST MAPLE STREET (U.S. ROUTE 30 / LINCOLN HIGHWAY)  
NEW LENOX, WILL COUNTY, ILLINOIS  
BUILDING NO. IDOT036-0001**

**CONTRACTS: GENERAL / DESIGN - BUILD ENTITY**

**State of Illinois**

# **CAPITAL DEVELOPMENT BOARD**

**USING AGENCY: ILLINOIS DEPARTMENT OF TRANSPORTATION**

**BY: RKG DESIGN GROUP, LLC  
16445 LEE AVENUE  
ORLAND PARK, ILLINOIS 60467  
DPR DESIGN FIRM REGISTRATION NO. 184.006730**

**DATE: JANUARY 17, 2018**



License Expiration Date: November 30, 2018

Signature: Robert Goes

Date Signed: 1/10/18

PROJECT MANUAL  
**00 01 10 – Table of Contents**

State of Illinois  
CAPITAL DEVELOPMENT BOARD

RKG Design Group LLC  
16445 Lee Avenue  
Orland Park, IL 60467

PROJECT MANUAL FOR

CDB Project No. 630-036-008

Construct Salt Storage Building – Bridging Documents  
New Lenox Maintenance Facility – District 1  
Illinois Department of Transportation  
New Lenox, Will County Illinois

DATE: January 17, 2018

<u>DIVISION</u>	<u>DOCUMENT</u>	<u>TITLE</u>	<u>PAGES</u>
00	00 01 10	Table of Contents	00 01 10-1-3
	00 01 15	Drawings, Schedules & Details	00 01 15-1-1
02		<u>EXISTING CONDITIONS</u>	
	02 31 32	Geotechnical Data	02 31 32-1-12
	02 61 13	Excavating & Handling Contaminated Materials	02 61 13-1-18
03		<u>CONCRETE</u>	
	03 30 53	Cast In-Place Concrete	03 30 53-1-6
05		<u>METALS</u>	
	05 50 00	Metal Fabrications	05 50 00-1-3
08		<u>OPENINGS</u>	
	08 11 13	Hollow Metal Doors and Frames	08 11 13-1-4
	08 33 00	Overhead Rolling Service Doors	08 33 00-1-5
	08 71 00	Door Hardware	08 71 00-1-4
	08 90 00	Louvers and Vents	08 90-00-1-4
09		<u>FINISHES</u>	
	09 91 23	Painting	09 91 23-1-3
13		<u>SPECIAL CONSTRUCTION</u>	
	13 65 00	Pre-Engineered/Manufactured Fabric Structures	13 65 00-1-9
23		<u>HEATING VENTILATING AND AIR CONDITIONING</u>	
	23 05 00	Ventilation Work	23 50 00-1-8

26		<u>ELECTRICAL</u>	
	26 05 00	Electrical Work	26 05 00-1-11
31		<u>EARTHWORK</u>	
	31 23 00	Excavating, Backfilling & Compacting	31 20 00-1-5
32		<u>EXTERIOR IMPROVEMENTS</u>	
	32 01 00	Surface Restorations	32 01 00-1-4
	32 12 16	Asphalt Paving	32 12 16-1-5
	32 75 10	Cement Concrete Pavement	32 75 10-1-4
33		<u>UTILITIES</u>	
	33 41 00	Storm Drainage Piping	33 41 00-1-4

SPECIFIERS:

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BIDDING & CONTRACT REQUIREMENTS  
**00 01 15 – Drawings, Schedules and Details**

G-1	Title Sheet & Location Plans
C-1	Site Plan
C-2	Enlarged Plan and Details
C-3	Grading Plan
A-1	Foundation / Floor Plan
A-2	Elevations
V-1	Ventilation Work
E-1	Electrical Work

All drawings dated January 17, 2018



1. GENERAL

A. REQUIREMENTS INCLUDE

1. General Contractor:
  - a. Verify data and existing conditions.
  - b. At Contractor's option, perform additional subsurface investigation at own expense.

B. RELATED REQUIREMENTS

1. Specified elsewhere:
  - a. 02 61 13 Excavating and Handling Contaminated Materials
  - b. 31 23 00 Excavating, Backfilling and Compacting
2. By Others: Bridging Documents Architect/Engineer has caused borings to be made at this site by IDOT Field Technical Services.
  - a. Soil boring location diagram and log are included in this Section.
  - b. Soil boring data is included for information only. CDB, the Using Agency and the Architect/Engineer do not guarantee the accuracy or validity of the data. Nor do they assume any responsibility for the Contractor's interpretation of the data.

C. SOIL BORING DATA

1. See attached logs and location sketch for information on ten, (10) borings numbered B-1 through B-10.

END 02 31 32





# SOIL BORING LOG

ROUTE New Lenox Maint Yard DESCRIPTION New Lenox Maintenance Yard-Salt Storage Bldg LOGGED BY M. Esposito

SECTION - LOCATION Southeast Quarter of, SEC. 17, TWP. 35N, RNG. 11E, 3<sup>rd</sup> PM,

Latitude 41°31'3.198", Longitude -87°59'30.8256"

COUNTY Will DRILLING METHOD HSA HAMMER TYPE Auto

STRUCT. NO.	Station	DEPT H	BLOW S	UCS Qu	MOIST	Surface Water Elev.	Stream Bed Elev.	Groundwater Elev.:	First Encounter	Upon Completion	After - Hrs.
		(ft)	(/6")	(tsf)	(%)						
NA	NA					NA	NA				
B-2	NA								None	None	None
	642.64										
Hot Mix Asphalt (8 inches)											
Aggregate Base Course (10 inches)		641.14									
Stiff Black trace brown, moist SILTY CLAY			3		18						
			2	1.1	28						
			3	B							
		-5									
	637.14		3								
Weathered, Fractured, Dolomite Limestone			28		4						
		100/4"									
		100/5"			6						
		-10									
			43								
		80			11						
	631.14	100/5"									
End of Boring											
		-15									
		-20									

SOIL BORING NEW LENOX MAINTENANCE YARD\_SALT DOME.GPJ IL\_DOT.GDT 9/18/17

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)  
 The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)







**Illinois Department of Transportation**

Division of Highways  
Illinois Department of Transportation District

**SOIL BORING LOG**

Date 9/11/17

ROUTE New Lenox Maint Yard DESCRIPTION New Lenox Maintenance Yard-Salt Storage Bldg LOGGED BY M. Esposito

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Latitude 41°31'3.198", Longitude -87°59'30.8256"

COUNTY Will DRILLING METHOD HSA HAMMER TYPE Auto

STRUCT. NO. <u>NA</u>	D E P T H  (ft)	B L O W S  (/6")	U C S  Qu (tsf)	M O I S T  (%)	Surface Water Elev. <u>NA</u> ft
Station <u>NA</u>					Stream Bed Elev. <u>NA</u> ft
BORING NO. <u>B-4</u>	Ground Surface Elev. <u>643.79</u> ft				Groundwater Elev.:
Station <u>NA</u>					First Encounter <u>None</u> ft
Offset <u></u>					Upon Completion <u>None</u> ft
Ground Surface Elev. <u>643.79</u> ft					After <u>-</u> Hrs. <u>None</u> ft

Hot Mix Asphalt (8 inches)					
Aggregate Base Course (10 inches)	642.29				
Medium Stiff Brown, moist SILTY CLAY	640.54	1		17	
Stiff Brown, moist LOAM	638.29	3 3	0.5 P 1.5 P	14	
Dense, Brown, Moist GRAVEL	635.54	15 23		5	
Weathered, Fractured, Dolomite Limestone	633.79	14 53		3	
Dense, Brown, Moist GRAVEL	630.29	100/2*		8	
Weathered, Fractured, Dolomite Limestone	628.29	14 30		12	
End of Boring		100/5*			
		100/4*		14	

SOIL BORING NEW LENOX MAINTENANCE YARD\_SALT DOME.GPJ IL\_DOT.GDT 9/18/17

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SECTION - LOCATION Southeast Quarter of, SEC. 17, TWP. 35N, RNG. 11E, 3<sup>rd</sup> PM,  
Latitude 41°31'3.198", Longitude -87°59'30.8256"

COUNTY Will DRILLING METHOD HSA HAMMER TYPE Auto

STRUCT. NO.	Station	DEPTH	BLOW	UNITS	MOIST	Surface Water Elev.	Stream Bed Elev.	Groundwater Elev.:	First Encounter	Upon Completion	After
		(ft)	(/6")	(tsf)	(%)						Hrs.
	NA					NA	NA		None	None	None
	NA										
BORING NO.	B-7										
Station	NA										
Offset											
Ground Surface Elev.	644.46	ft									
Hot Mix Asphalt (8 inches)	643.79										
Black, moist SILTY CLAY (possible topsoil)	642.46				15						
Stiff Brown, moist SILTY CLAY			1	1.7	20						
	639.96		2	B							
Brown, moist SILTY LOAM, with rock fragments		-5	20								
			16		15						
			17								
Weathered, Fractured, Dolomite Limestone	636.96		100/4"		7						
		-10	100/2"		7						
	631.46		100/2"								
End of Boring											
		-15									
		-20									

SOIL BORING NEW LENOX MAINTENANCE YARD\_SALT DOME.GPJ IL\_DOT.GDT 9/18/17

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)  
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# SOIL BORING LOG

ROUTE New Lenox Maint Yard DESCRIPTION New Lenox Maintenance Yard-Salt Storage Bldg LOGGED BY M. Esposito

SECTION - LOCATION Southeast Quarter of, SEC. 17, TWP. 35N, RNG. 11E, 3<sup>rd</sup> PM,  
Latitude 41°31'3.198", Longitude -87°59'30.8256"

COUNTY Will DRILLING METHOD HSA HAMMER TYPE Auto

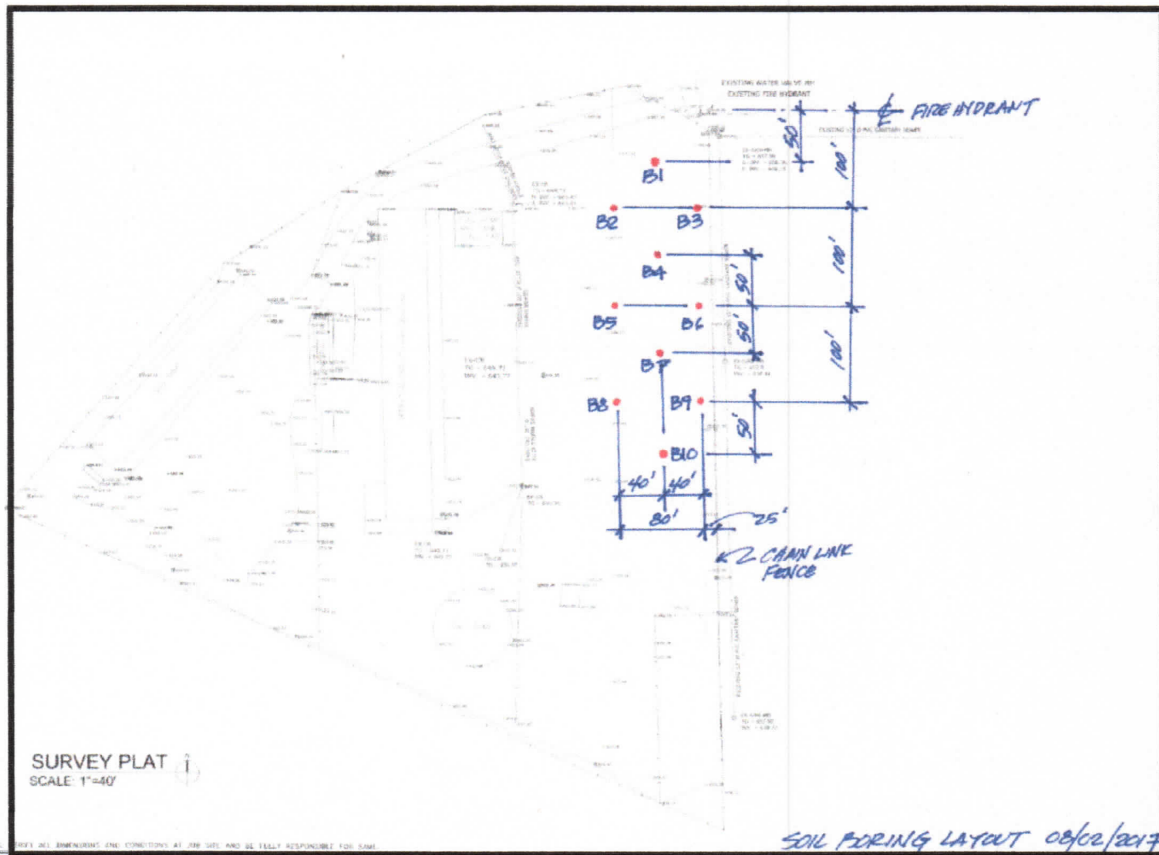
STRUCT. NO.	Station	DEPT H	B L O W S	U C S	M O I S T	Surface Water Elev.	Stream Bed Elev.	Groundwater Elev.:	First Encounter	Upon Completion	After - Hrs.
		(ft)	(/6")	(tsf)	(%)						
NA	NA					NA	NA				
B-9	NA								None	None	None
	646.37										
Hot Mix Asphalt (6 inches)											
Bituminous Grindings (6 inches) 645.37											
Stiff Brown, moist CLAY			2								
			2	1.3	17						
			5	P							
		-5									
640.87			100/3"		4						
Weathered, Fractured, Dolomite Limestone											
		638.70									
End of Boring			100/2"		5						
		-10									
		-15									
		-20									

SOIL BORING NEW LENOX MAINTENANCE YARD\_SALT DOME.GPJ IL\_DOT.GDT 9/18/17

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)  
 The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)







## Boring Location Plan

**Location:** New Lenox Maintenance Facility  
Salt Storage Building

**County:** Will

**Contract:** Unknown



## **DIVISION 2 – EXISTING CONDITIONS**

### Section 02 61 13 – Excavation & Handling of Contaminated Materials

#### 1. **GENERAL**

##### 1.1 WORK INCLUDES

###### A. Base Bid:

###### 1. General Contractor Provide:

- a. Temporary storage, handling, hauling, and legal disposal of contaminated soils or other wastes found within the project limits. This includes contaminated soil, sediments, or water generated during the excavation process in support of construction activities.
- b. Comply with all Federal, State, and local law or ordinances regarding the handling and proper disposal of contaminated soils.
- c. Procure all permits and licenses, pay all charges and fees, and give all notices necessary and incidental to the lawful completion of the work.
- d. Provide a qualified environmental firm for producing required environmental plans and reports, monitoring and testing all excavation work. Provide work as specified in submittals paragraph.
- e. Field sampling and testing results for the purpose of landfill characterization and disposal in accordance to the requirements in Section 3.13 of this specification

###### B. Alternate Bid:

1. Not Applicable.

###### C. Payment Requirements:

###### 1. Method of Measurement:

- a. Temporary storage, handling, hauling, and legal disposal of contaminated soil and sediment will be measured for payment in their original positions (i.e., in situ) and the volumes in cubic yards; as computed by the method of average end areas. (Refer to paragraphs 3.5.B.9)
- b. Material moved more than once due to either stage construction or other requirements will be measured for payment only once.

###### 2. Basis of Payment:

- a. The transportation and disposal of contaminated soil,

sediment and other materials from an excavation will be paid for as part of the Design-Build Entities lump sum proposal. Any variance (increase or decrease from the quantity identified in the RFP will require a price adjustment by Change Order for NON-SPECIAL WASTE DISPOSAL, SPECIAL WASTE DISPOSAL, HAZARDOUS WASTE DISPOSAL, or CCDD/USFO DISPOSAL. (refer to paragraphs 3.5.B.9).

## 1.2 RELATED WORK

### A. Specified Elsewhere:

1. 00 31 32 – Soil Boring Report
2. 01 11 00 – Project Summary
3. 01 45 29 – Testing Laboratory Services
4. 02 31 32 – Geotechnical Data
5. 31 23 00 – Excavation Backfill and Compaction for Structures

## 1.3 REFERENCES

- A. *Project Site Specific Investigation Reports*. New Lenox Yard (136)/ Weston Solutions Report No.: 02056-015-017, dated October 17, 2017 (available upon request).
- B. IDOT Standard Specifications for Road and Bridge Construction (SSPBC), adopted April 1, 2016, including all current editions of Supplemental Specifications, and Recurring Special Provisions (Must be purchased through IDOT).
- C. American Petroleum Institute (API) Recommended Practice 1604 (Can be purchased through API)
- D. Project Storm Water Pollution Prevention Plan (SWPPP), as applicable (available upon request).
- E. Illinois Environmental Protection Agency (IEPA) Forms LPC-663 (available upon request).
- F. Preliminary Environmental Site Assessment (PESA) 1628V2, as applicable (redacted copy available upon request).

## 1.4 QUALITY ASSURANCE

### A. Regulatory Requirements.

1. Shall at all times observe and comply with all Federal and State laws, local laws, ordinances, and regulations which in any manner affect the conduct of the work and all such orders or enactments as exist at the present and which may be enacted later, of legislative bodies or tribunals having legal jurisdiction or which may have affect over the work, and no plea or misunderstanding or ignorance

thereof will be considered.

2. Procure all permits and licenses, pay all charges and fees, and give all notices necessary and incident to the due and lawful prosecution of the work.

B. Contractor Qualifications.

1. Shall be an environmental firm with at least five (5) documented leaking underground storage tank cleanups or that is prequalified in “hazardous waste” by IDOT or “environmental” by CDB.
2. Documentation includes, but is not limited to; verifying remediation and special waste operations for sites contaminated with gasoline, diesel, or waste oil in accordance with all Federal, State, or local regulatory requirements, and shall be provided to the A/E and the Using Agency for review and approvals.
3. The contractor shall not be a former or current consultant or have any ties with any of the properties contained within and/or adjacent to this construction project.
4. A list of IDOT prequalified environmental firms may be accessed at: <http://www.idot.illinois.gov/doing-business/procurements/engineering-architectural-professional-services/index>.
5. UST only; the contractor shall be licensed and certified with the Illinois Office of the State Fair Marshall (OSFM) and shall possess all required permits to perform the work as indicated prior to bidding.

1.5 ABBREVIATIONS/DEFINITIONS

- A. API – American Petroleum Institute
- B. CFR – Code of Federal Regulations
- C. CCDD/USFO – Clean Construction and Demolition Debris / Uncontaminated Soil Fill Operation; as defined in 35 Illinois Administrative Code (IAC), Subtitle J, Chapter I, Section 1100.
- D. COCs – Contaminants of Concern
- E. Illinois Department of Transportation (IDOT)
- F. Hazardous waste – as defined by 40 CFR, Part 261; and 35 IAC, Sections 722, 723, 726, 728, and 729
- G. IEMA – Illinois Emergency Management Agency
- H. IEPA – Illinois Environmental Protection Agency
- I. LUST – Leaking underground storage tank
- J. MAC – Maximum Allowable Concentrations for chemical constituents in



uncontaminated soil; as defined in 35 IAC, Section 1100.605.

- K. MSA – Metropolitan Statistical Area county; as defined in 35 IAC, Section 742.200
- L. NPDES – National Pollutant Discharge Elimination System
- M. OSHA – Occupational Safety and Health Administration
- N. OSFM – Office of the Illinois State Fire Marshall
- O. Special Provisions – Additions and/or revisions to standard and supplemental guide specifications covering conditions peculiar to an individual contract.
- P. Special waste – As defined in 35 IAC, Sections 808 and 809
- Q. UST – Underground Storage Tank
- R. Work Zones:
  - 1. Exclusion Zones are the areas where contamination does or could occur. These zones have the highest inhalation exposure potential and/or a high probability of skin contact with potential contaminants/contaminated material. The Exclusion Zone designation shall remain until the entire excavated area has been completely backfilled. Ensure that neither their employees nor subcontractors execute maintenance nor repair operations on equipment located in the Exclusion Zone
  - 2. Decontamination Zones are areas established to prevent the transfer of contaminants outside the Exclusion Zones. This zone eliminates the possibility of the physical transfer of contaminating substances on people, equipment, or in the air to unregulated areas. A combination of decontamination, distance from active work areas, zone restrictions, and work function shall eliminate the possibility of physical transfer of contamination. This zone has the next highest inhalation hazard, but does not pose a high probability of skin contact. This zone shall contain the equipment decontamination facility, and areas designated for personnel decontamination, and emergency equipment.
  - 3. Support zones shall include the remaining areas of the job site. This zone shall contain the change and shower rooms, lunch and break areas, operation direction, and support facilities (including supplies, equipment storage, and maintenance areas). No equipment or personnel shall enter the Support Zone from the Exclusion Zone without passing through the personnel or equipment Decontamination Zone. Eating, smoking, etc., shall be allowed only in this zone.

## 1.6 SUBMITTALS

- A. File a written Site Contamination Operation Plan, Site Health and Safety

Plan, and Site Contamination Erosion Control Plan applicable for all personnel working on the project. The Site Health and Safety Plan shall pertain to any visitors or State employees at the site. The Contractor shall submit monthly or quarterly reports as well as a final environmental construction report to the A/E and Using Agency. These three plans must be completed upon receiving Authorization to Proceed (ATP) and must be accepted by the Using Agency two weeks prior to disturbing any contaminated soils.

- B. Provide a State certified manifest to the A/E and Using Agency for the transport and disposal of all non-hazardous special waste (hereafter referred to as special waste) or hazardous waste, as well as any removed underground storage tanks (USTs).
- C. Site Contamination Operation Plan
  1. Develop a project specific Site Contamination Operation Plan and submit the plan to the A/E and Using Agency a minimum of two weeks before beginning construction activities. The plan shall outline the procedures used to mobilize all required subcontractors in a timely fashion, and provisions to continue work in areas determined to be contaminated. The plan shall also meet all requirements for the removal and disposal of non-special waste, special waste, or hazardous waste.
  2. The Site Contamination Operation Plan shall provide a list of all proposed subcontractors, indicating the service each is to provide. The Contractor and subcontractors shall provide a Statement of Qualifications demonstrating their capabilities to provide services as indicated in the Site Contamination Operation Plan.
- D. Site Health and Safety Plan
  1. Develop a Site Health and Safety Plan for the project. In performance of the work the Contractor shall, at a minimum, satisfy all federal, state and local statutes, regulations and ordinances, regarding health and safety, including medical record retention requirements.
  2. Submit the Site Health and Safety Plan to the A/E a minimum of two weeks before beginning excavation activities.
  3. The Health and Safety Plan shall specify procedures and equipment to protect site workers and observers from hazards encountered during activities in locations containing contaminated material.
  4. A qualified industrial hygienist or health and safety specialist shall prepare the Health and Safety Plan. The Contractor's Corporate Officer responsible for worker health and safety shall approve and sign the plan before submittal to the A/E and Using Agency

5. A qualified industrial hygienist is defined as having a minimum of five years of experience in the industrial hygiene field, an academic degree in a related science field, and successful completion of two days of testing presented by the American Board of Industrial Hygiene. A Certified Industrial Hygienist (CIH) meets the above definition.
6. A qualified Health and Safety Specialist is defined as having a minimum of three (3) years' experience in hazardous waste operations, familiar with applicable health and safety procedures and protocols, and holds current training status according to 29 CFR 1910.120. This person may be a Certified Safety Professional (CSP), or an Illinois Registered Professional Engineer or Professional Geologist. A CSP has a minimum of four years of professional safety experience, has a baccalaureate degree in safety, and has successfully completed the Safety Fundamentals examination and subsequent Specialty Examination presented by the Board of Certified Safety Professionals.
7. The Contractor's Corporate Officer responsible for the Contractor's health and safety program and approval of the Health and Safety Plan shall be able to identify hazards; assess employee exposure and risk; have knowledge of OSHA standards, hazards correction techniques and practices, work place safety, and health program requirements. This person shall also be able to effectively communicate this knowledge both orally and in writing or contract for these abilities with a qualified Industrial Hygienist or Health and Safety Specialist.
8. The responsibility for the implementation and enforcement of all health and safety requirements lies solely with the Contractor the Contractor shall take all necessary precautions for the safety of, and provide the necessary protection to prevent damage, injury or loss to construction personnel performing work within the Exclusion and Decontamination Zones. The Contractor shall ensure all workers involved in any activities within the contaminated locations or associated with the contaminated materials are conversant with all the requirements of the Health and Safety Plan and have signed off and dated personal acknowledgment of the plan. The Contractor shall post copies of the plan at various locations throughout the work area to facilitate spontaneous review.
9. Any delays in work start-up or down time that are the result of Contractor time requirements for performing amendments to the Health and Safety Plan or Contractor inability to comply with EPA and/or OSHA safety and health regulations will not be compensated.

## 2. PRODUCTS

### 2.1 MATERIALS

- A. Personal Protective Equipment: Ensure each worker has the proper personal protective equipment (PPE) for the zone and location in which he/she is to perform construction or materials management activities. Also is responsible for providing all personal protective equipment (PPE) required, and defining the provisions for personal protective equipment (PPE) in the Site Health and Safety Plan.
- B. Warning Devices and Barricades: Adequately identify and guard all hazardous areas and conditions by visual warning devices and, where necessary, physical barriers. As required, excavations from which the public is excluded shall be marked or guarded in a manner appropriate to the hazard.
- C. Equipment:
  - 1. All equipment shall comply with OSHA and API guidelines. Decontamination shall be performed on all equipment as appropriate to the regulated substance and degree of contamination according to OSHA and API guidelines. All cleaning fluids used to decontaminate the tank and/or equipment shall be treated as the contaminant unless laboratory testing proves otherwise.
  - 2. Furnish, in a clean condition, all equipment used for purposes of excavation, temporary storage, and transportation of material classified as non-special waste, non-hazardous special waste, or hazardous waste. Clean condition means the equipment does not contain any residual material classified as a non-special waste, non-hazardous special waste, or hazardous waste. Residual materials include, but are not limited to, petroleum products, chemical products, sludge's, or any other material present in or on equipment.
  - 3. Notify the A/E of the delivery of all excavation, storage, and transportation equipment to a work area location before beginning any associated soils management activity. Provide the A/E and Using Agency with the opportunity to inspect the equipment. The A/E or the Using Agency shall approve the use of the equipment at the time of the visual inspection. Decontaminate the equipment if it contains contaminated residual material.

## 3. EXECUTION

### 3.1 PERSONNEL ACTION:

- A. Medical Exams; certify that all personnel in his/her work force how shall be working in an Exclusion or Decontamination Area, have received and passed a current medical examination as required under Federal, State, or

Local laws.

- B. Health and Safety Training; certify that all personnel within his/her work forces who shall be working within an Exclusion or Decontamination Area successfully completes a forty (40) hour Health and Safety Training Course pursuant to the Federal, State, and/or Local law, including OSHA 29 CFR 1910.120. All supervisors and craft foremen shall have successfully completed and additional eight (8) hour Supervisor Training Course pursuant to OSHA 29 CFR 1910.120.

3.2 WORK ZONES: Three distinct zones (exclusion, decontamination, and support) shall divide the affected portions of the project.

- A. Protection: Determine the level of appropriate protection in accord with the Site Health and Safety Plan. Ensure the proper and appropriate protective is being used during activities in the Exclusion Zone and Decontamination Zone. Notify the A/E and Using Agency of any variations from the defined levels of protection as stipulated in the Site Health and Safety Plan in writing prior to any protection modifications.

3.3 DECONTAMINATION:

- A. All personnel shall go through decontamination who have participated in construction or soil management activities within the Exclusion Zone. In addition, the Contractor shall perform a wet and/or dry decontamination process on excavation and construction equipment as specified when equipment is in contact with contaminated material. No equipment or vehicle shall track visible material from a contaminated facility.

- 1. Personnel Decontamination. All outer protective clothing used by personnel who contact contaminated material while in the Exclusion Zone shall be collected in plastic bags and placed in leak-proof sealable containers, such as 55 gal (208 L) open-top drums. Transport all containers to a secure staging area for temporary storage. Inform the A/E and Using Agency of the time and manner of disposal of containers containing contaminated protective clothing. Be responsible for transporting and disposing of the containers. Be responsible for ensuring the personnel decontamination portion of this zone contains clean, unused 6 mil (150 micron) polyethylene sheeting.

2. Equipment decontamination:

- a. Dry Decontamination: Perform dry decontamination on equipment that has contacted material classified as a non-special waste, special waste, or hazardous waste before moving that equipment to any other location, whether the new location is contaminated or uncontaminated. Dry equipment decontamination shall consist of the removal of all visible material from excavation and construction equipment parts, such as shovels, wheel tracks, and



buckets. During dry decontamination, ensure that removed contaminated material does not contact the ground surface. Place all contaminated material removed during dry decontamination with contaminated material of similar classification and dispose of with other excavated material from that facility location.

- b. Wet Decontamination: Perform wet decontamination process when construction/soil management activities associated with non-special waste, special waste, or hazardous waste are followed by construction/soil management activities associated with uncontaminated excavation or fill material. If the A/E observes residual and/or nonspecial waste, special waste, or hazardous waste material during the initial (or subsequent) inspection of equipment, the A/E or Using Agency will require either wet and/or dry decontamination before approving equipment for use at another location. Before departure from the project area, all equipment and vehicles in contact with contaminated material(s) shall be wet decontaminated.
- c. Personnel shall perform all wet equipment decontamination within the Decontamination Zone on equipment decontamination pad(s). The Contractor shall be responsible for the construction and maintenance of the decontamination pad(s) and for all equipment, materials, and personnel. The pad(s) shall be designed to prevent loss of decontamination liquids to the surrounding environment through vertical infiltration and/or surface runoff from any part of the pad(s).
- d. Place all removed wastes from the decontamination pad(s) in leak-proof containers and store temporarily in a secure staging area. Containerize the solids separate from the liquids, and be responsible for the transport and disposal of all waste generated from the decontamination process.

### 3.4 EROSION AND SEDIMENT CONTAMINATION CONTROL PLAN:

- A. Prevent storm water from Support Zones from running into excavated contaminated areas. Divert all storm water away from the Exclusion and Decontamination Areas using appropriate storm water and erosion control methods.
- B. Failure to use appropriate measures to divert storm water will subject the Contractor to removing and properly containing the water at their own expense with no added cost to the State. Provide pumps and collect standing water from the excavation before continuing removal activities or other construction activities. Collect the removed water, place it in leak-proof storage containers, and store it in a secure staging area for future

testing. Ensure the storage containers have access points to facilitate sampling. Inform the A/E and Using Agency concerning management and disposal requirements for the water following the evaluation of the analytical results.

- C. Control and minimize the release of dust during non-special waste, special waste, or hazardous waste removal activities. Use water or acceptable chemicals to control dust emissions. Submit, in writing or include within the Site Contamination Operation Plan, a description of intended dust control measures to the A/E and Using Agency for approval at least two weeks before commencement of soil excavation/construction activities.

### 3.5 CONTAMINATED SOIL

- A. Perform excavation activities in a manner that will limit spills and the potential for contaminated soil to be mixed with uncontaminated soil. Direct load contaminated soil into roll-off containers or trucks for transportation and disposal, as required. The Contractor shall be responsible for obtaining all approvals for final disposal of contaminated and uncontaminated soil.

Management and disposal of contaminated soil shall be according to the following:

Soil Analytical Results Exceed Most Stringent MAC. When the soil analytical results indicate that detected levels exceed the most stringent maximum allowable concentration (MAC) for chemical constituents in uncontaminated soil established pursuant to Subpart F of 35 Illinois Administrative Code 1100.605, the soil shall be managed as follows:

- 1. When analytical results indicate inorganic chemical constituents exceed the most stringent MAC but they are still considered within area background levels by the Engineer, the excavated soil can be utilized within the construction limits as fill, when suitable. Such soil excavated for storm sewers can be placed back into the excavated trench as backfill, when suitable, unless trench backfill is specified. If the soils cannot be utilized within the construction limits, they shall be managed and disposed of off-site as a non-special waste, special waste, or hazardous waste as applicable. [SSRBC 669.09(a)(1)]

- a. The conditions described above are met and the Contractor shall manage any excavated soils and sediment in accordance with these criteria within the following areas.

***All north-south dimensions are measured from the point where the eastern perimeter fence intersects the front gate fence post (gate post). Offset distances are then measured from the eastern perimeter fence line.***

***From 40 to 140 feet south of the gate post, and from 0 to 60 feet west of the eastern fence (IDOT New Lenox Yard (136), 1400 West Maple, New Lenox, Will County, Illinois) – This material meets the criteria of, and shall be managed in accordance with this subsection. COCs sampling parameters: chloride, arsenic, and manganese.***

***From 335 feet to 425 feet south of the gate post, and from 0 to 140 feet west of the eastern fence (IDOT New Lenox Yard (136), 1400 West Maple, New Lenox, Will County, Illinois) – This material meets the criteria of, and shall be managed in accordance with this subsection. COCs sampling parameters: chlorides, arsenic, and manganese.***

2. When analytical results indicate chemical constituents exceed the most stringent MAC but do not exceed the MAC for a Metropolitan Statistical Area (MSA) County, the excavated soil can be utilized within the construction limits as fill, when suitable, or managed and disposed of off-site as “uncontaminated soil” at a CCDD facility or an uncontaminated soil fill operation within an MSA County provided the pH of the soil is within the range of 6.25 - 9.0, inclusive. In the event the soils cannot be managed on-site or to a CCDD/USFO, the soils shall be managed as a “non-special waste” providing that a “non-special waste certification” is submitted by the generator according to the conditions in 415 ILCS 5/22.48 and 415 ILCS 5/3.475; and as described in the Non-Special Waste Certification. [SSRBC 669.09(a)(2)]

- a. The conditions described above are met and the Contractor shall manage any excavated soils and sediment in accordance with these criteria within the following areas.

***All north-south dimensions are measured from the point where the eastern perimeter fence intersects the front gate fence post (gate post). Offset distances are then measured from the eastern perimeter fence line.***

***From 135 to 335 feet south of the gate post, and from 0 to 60 feet west of the eastern fence (IDOT New Lenox Yard (136), 1400 West Maple, New Lenox, Will County, Illinois) – This material meets the criteria of, and shall be managed in accordance with this subsection. COCs sampling parameters: arsenic and manganese.***

3. When analytical results indicate chemical constituents exceed the most stringent MAC but do not exceed the MAC for an MSA County excluding Chicago, or the MAC within the Chicago corporate limits, the excavated soil can be utilized within the construction limits as fill, when suitable, or managed and disposed of off-site as “uncontaminated soil” at a CCDD facility or an uncontaminated soil fill operation within an MSA County excluding Chicago or within the Chicago corporate limits provided the pH of the soil is within the range of 6.25 - 9.0, inclusive. In the event the soils cannot be managed on-site or to a CCDD/USFO, the soils shall be managed as a “non-special waste” providing that a “non-special waste certification” is submitted by the generator according to the conditions in 415 ILCS 5/22.48 and 415 ILCS 5/3.475; and as described in the Non-Special Waste Certification paragraph. [SSRBC 669.09(a)(3)]
4. When analytical results indicate chemical constituents exceed the most stringent MAC but do not exceed the MAC for an MSA County excluding Chicago, the excavated soil can be utilized within the construction limits as fill, when suitable, or managed and disposed of off- site as “uncontaminated soil” at a CCDD facility or an uncontaminated soil fill operation within an MSA County excluding Chicago provided the pH of the soil is within the range of 6.25 - 9.0, inclusive. In the event the soils cannot be managed on-site or to a CCDD/USFO, the soils shall be managed as a “non-special waste” providing that a “non-special waste certification” is submitted by the generator according to the conditions in 415 ILCS 5/22.48 and 415 ILCS 5/3.475; and as described in the Non-Special Waste Certification paragraph. [SSRBC 669.09(a)(4)]
5. When the Using Agency determines soil cannot be managed according to Section 3.5 (A)(1) through 3.5 (A)(4) above, the soil shall be managed and disposed of off-site as a non-special waste, special waste, or hazardous waste as applicable. [SSRBC 669.09(a)(5)]
  - a. The conditions described above are met and the Contractor shall manage any excavated soils and sediment in accordance with these criteria within the following areas.

***All north dimensions are measured from the point where the eastern perimeter fence intersects the front gate fence post (gate post). Offset distances are then measured from the eastern perimeter fence line.***

    - From 40 to 135 feet south of the gate post, and from 60 to 140 feet west of the eastern fence (IDOT New Lenox Yard (136), 1400 West Maple, New Lenox, Will County, Illinois) - This material meets the criteria of, and shall be managed in

accordance with the subsection. COCs sampling parameters: chlorides, arsenic, manganese.

- From 235 to 335 feet south of the gate post, and from 50 to 140 feet west of the eastern fence (IDOT New Lenox Yard (136), 1400 West Maple, New Lenox, Will County, Illinois) – This material meets the criteria of, and shall be managed in accordance with this subsection. COCs sampling parameters: chlorides, arsenic, and manganese.

6. Soil Analytical Results Do Not Exceed Most Stringent MAC. When the soil analytical results indicate that detected levels do not exceed the most stringent MAC, the excavated soil can be utilized within the construction limits or managed and disposed of off-site as “uncontaminated soil” according to Article 202.03 of IDOT’s Standard Specifications for Road and Bridge Construction (Adopted April 1, 2016). However, the excavated soil cannot be taken to a CCDD facility or an uncontaminated soil fill operation for any of the following reasons:
  - a. The pH of the soil is less than 6.25 or greater than 9.0. [SSRBC 669.09(b)(1)]
  - b. The soil exhibited elevated photoionization detector (PID) utilizing a lamp of 10.6eV or greater or a flame ionization detector (FID) readings. [SSRBC 669.09(b)(2)]
7. Aside from the materials listed above in Contaminated Soils, Most Stringent MAC and Do Not Exceed Most Stringent MAC, all other construction and demolition debris or waste shall be disposed of in a licensed landfill, recycled, reused, or otherwise disposed of as allowed by State or Federal laws and regulations. When the Contractor chooses to dispose of uncontaminated soil at a clean construction and demolition debris (CCDD) facility or at an uncontaminated soil fill operation, it shall be the Contractors responsibility to have the pH of the material tested to ensure the value is between 6.25 and 9.0, inclusive. A copy of the pH test results shall be provided to the A/E and the Using Agency.
8. Suitable excavated materials naturally occurring within the construction limits shall not be wasted without permission of the A/E. The Contractor shall dispose of all surplus, unstable, unsuitable, and organic materials in such a manner that public or private property will not be damaged or endangered.
9. The estimated volumes of “Special Waste”, “Non-Special Waste” or of “Uncontaminated Soil” are in situ soils to be removed and disposed. These are the A/E’s best estimate of in situ or in place quantities. These differ from haul quantities and the Contractor shall use in situ quantities as reference only.

- ***The volume of soil to be managed as non-special waste to a permitted disposal facility is estimated at 1,476 cubic yards (CY) in-situ.***
- ***The volume of soil to be managed as uncontaminated soil to a CCDD/USFO facility is estimated at 661 CY in-situ.***

3.6 CONTAMINATED GROUNDWATER:

A. Not Applicable

3.7 WASTE MINIMIZATION:

A. Minimize the generation of contaminated waste to the extent practicable. Take all necessary precautions to avoid mixing contaminated wastes of differing characteristics.

3.8 TRANSPORTATION OF REGULATED MATERIALS:

- A. Arrange for all transportation needs of contaminated soils or groundwater management and disposal. Ensure the transporters are licensed special/hazardous waste haulers in the State of Illinois.
- B. Provide complete manifests necessary and required for transportation and disposal of all regulated waste materials and have them in hand while transporting wastes.
- C. Ensure all required placarding and labeling complies with all applicable Federal, State, or local regulations and requirements.
- D. Remove all soils, dust, rocks, etc., from the exterior of trucks, trailers, or any other heavy equipment involved with contaminated soil excavation, loading, or transportation before they leave the project site.

3.9 CONTAMINATED SOIL STOCKPILING:

- A. Work in this section includes management and tracking of contaminated soil stockpiled materials at the site during generation, storage, sampling, and loading until stockpiled soil materials are removed from the site or reused.
- B. Excavate and dispose of all waste material as mandated by contaminates without temporary staging, if possible. If circumstances require the Contractor to use temporary stockpiling, the A/E shall request, in writing, approval from the Using Agency.
- C. Prepare a secure location within the project area capable of housing containerized waste materials. Contain all waste material in leak-proof storage containers such as lined roll-off boxes or 55 gal (208 L) drums; or stored in bulk fashion on storage pads. The design and construction of such storage pad(s) for bulk materials shall be subject to approval by the A/E. Place the staged storage containers on a stable all-weather surface such as compacted gravel/earth, asphalt, or concrete. Maintain a

clearance both above and beside the storage units to provide maneuverability during loading and unloading. Provide any assistance or equipment requested by the A/E or the Using Agency for authorized personnel to inspect and/or sample contents of each storage container. All containers and their contents shall remain intact and undisturbed by unauthorized persons until the manner of disposal is determined. Keep the storage containers covered, except when access is requested by the A/E or Using Agency.

- D. Ensure the staging area is enclosed (by a fence or other structure) to ensure direct access to the area is restricted, and procure and place all required regulatory identification signs applicable to an area containing the waste material. The Contractor shall be responsible for all activities associated with the storage containers including, but not limited to, the procurement, transport, and labeling of the containers.
- E. Clearly mark all containers in permanent marker or paint with the date of waste generation, location and/or area of waste generation, and type of waste (e.g., decontamination water, contaminated clothing, etc.). Clearly place these identifying markings on an exterior side surface of the container.
- F. Separately containerize each contaminated medium, i.e. contaminated clothing is placed in a separate container from decontamination water. Containers used to store liquids shall not be filled in excess of 80 percent of the rated capacity.
- G. Do not use a storage container if visual inspection of the container reveals the presence of free liquids or other substances that could classify the material as a hazardous waste in the container.
- H. Additional costs for any delays or mismanagement of the material is the Contractor's responsibility.

### 3.10 UNDERGROUND STORAGE TANKS:

- A. Not Applicable

### 3.11 ENGINEERED BARRIERS:

- A. Not Applicable

### 3.12 SEALING ABANDONED WELLS:

- A. Not Applicable

### 3.13 DISPOSAL FACILITY ACCEPTANCE SAMPLING AND ANALYSIS:

- A. When the waste material for disposal requires sampling for landfill acceptance, the samples shall be analyzed for TCLP VOCs, TCLP SVOCs, TCLP RCRA metals, TCLP pesticides, TCLP herbicides, PCBs, pH, flash point, paint filter, reactive cyanide, and reactive sulfide. Note that the list of analytes is considered comprehensive; however, testing requirements for individual disposal facilities may vary. The

CONTRACTOR shall be responsible for determining the specific disposal facilities to be utilized; and collect and analyze any samples required for disposal facility acceptance using a NELAP certified analytical laboratory registered with the State of Illinois.

1. ***A landfill disposal acceptance sample was collected for this project during the PSI. Analytical data is available in the "Final Preliminary Site Investigation (PSI) Report."***

### 3.14 NON-SPECIAL WASTE CERTIFICATION:

- A. An authorized representative of the Using Agency shall sign and date all non-special waste certifications. The Contractor shall be responsible for providing the A/E with the required information that will allow the A/E to certify the waste is not a special waste.
  1. Definition. A waste is considered a non-special waste as long as it is not:
    - a. A potentially infectious medical waste.
    - b. A hazardous waste as defined in 35 IAC 721.
    - c. An industrial process waste or pollution control waste that contains liquids, as determined using the paint filter test set forth in subdivision (3)(A) of subsection (m) of 35 IAC 811.107.
    - d. A regulated asbestos-containing waste material, as defined under the National Emission Standards for Hazardous Air Pollutants in 40 CFR 61.141. (\*Specify as Appropriate)
    - e. A material containing polychlorinated biphenyls (PCB's) regulated pursuant to 40 CFR Part 761,
    - f. A material subject to the waste analysis and record keeping requirements of 35 IAC 728.07 under land disposal restrictions of 35 IAC 728.
    - g. A waste material generated by processing recyclable metals by shredding and required to be managed as special waste under Section 22.29 of the Environmental Protection Act.
    - h. An empty portable device or container, in which a special or hazardous waste has been stored, transported, treated, disposed of, or otherwise handled.

### 3.15 SPECIAL ENVIRONMENTAL CONDITIONS:

- A. Not Applicable

### 3.16 FINAL ENVIRONMENTAL CONSTRUCTION REPORT:

- A. At the end of the project, prepare and submit hard copy and electronic files of the Final Environmental Construction Report on the activities



conducted during the life of the project and distribute as follows:

1. One (1) electronic copy (pdf.) shall be submitted to the CDB Project Manager.
  2. One (1) hardcopy and electronic copy (pdf.) shall be submitted to the A/E.
  3. One (1) electronic (pdf.) shall be submitted to the Using Agency.
  4. One (1) electronic copy (pdf.) shall be submitted to the Geologic and Waste Assessment Unit, Bureau of Design and Environment, IDOT Room 330, 2300 South Dirksen Parkway, Springfield, IL 62764.
- B. The technical report shall include all pertinent information regarding the project including, but not limited to:
1. Measures taken to identify, monitor, handle, and dispose of soil or groundwater containing regulated substances, to prevent further migration of regulated substances, and to protect workers.
  2. Cost of identifying, monitoring, handling, and disposing of soil, groundwater, and/or sediment containing regulated substances, the cost of preventing further migration or regulated substances, and the cost for worker protection from the regulated substances as identified by the preliminary environmental site investigation (PESA).
  3. All costs for the work shall be shown/included on the CDB CASS and CSV.
  4. Plan sheets showing the areas containing the regulated substances with delineation of actual removal boundaries.
  5. Field sampling and testing results used to identify the nature and extent of the regulated substances.
  6. Waste manifests (identified by the preliminary environmental site investigation (PESA)) for special or hazardous waste disposal.
  7. Landfill tickets (identified by the preliminary environmental site investigation (PESA)) for non-special waste disposal.
  8. Representative photographs of the activities conducted throughout the project including descriptive captions, date and time, directions facing and other necessary details.

### 3.17 UNEXPECTED SUBSTANCES:

- A. If abnormal conditions are exposed during the construction which may indicate the presence of a regulated substance, work in this area shall be immediately discontinued. Notify the A/E and Using Agency immediately. A regulated substance is a hazardous substance, special waste or petroleum or any fraction thereof, as those terms are defined in the Illinois Compiled Statutes.

- B. Abnormal conditions include but are not limited to the following: Presence of underground storage tanks (UST's), drums, barrels, discolored earth, metal, wood, etc. Visible fumes, obnoxious or unusual odors, excessively hot earth, smoke, or any other condition which appears abnormal and be a possible indicator of the presence of regulated substances. The conditions shall be treated with extraordinary caution. Appropriate action shall be taken to ensure public and employee safety.
- C. Operations shall not resume until directed by the A/E or the Using Agency. The Using Agency may contact the Illinois Emergency Management Agency (IEMA) and/or the Illinois Environmental Protection Agency (IEPA). Further removal and disposal operations shall be in accord to the project specifications and the CDB SDC.
- D. Disposition of regulated substances shall be made according to the requirements of the IEMA. Any waste generated as a special waste or hazardous waste shall be manifested off-site using the IDOT facility generator number. The A/E will sign all manifests for the disposal of the contaminated material and confirm the Contractor transported volume.
- E. Any waste generated as a non-special waste may be disposed of off-site at a facility permitted by the IEPA without a manifest, a special waste transporter, and a generator number.

END 02 61 13

## PART 1 - GENERAL

### 1.1 WORK INCLUDES

- A. Base Bid:
  - 1. Contractor provides design and complete installation of:
    - a. All cast-in-place concrete, including reinforcement, concrete materials, mixture design, placement procedures, and finishes.
    - b. Waterborne cure and seal product to exposed interior walls only.
- B. Alternate Bid G-1:
  - 1. Contractor provides: Cast-in-place concrete as specified herein for a fifteen foot (15') extension to the Base Bid building as indicated on the plans.
- C. Alternate Bid G-2:
  - 1. Contractor provides: Cast-in-place concrete as specified herein for a thirty foot (30') extension to the Base Bid building as indicated on the plans

### 1.2 RELATED WORK

- A. 31 23 00 Excavating, Backfilling & Compacting
- B. 09 91 23 Painting

### 1.3 QUALITY ASSURANCE

- A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
- D. Comply with ACI 301-10, "Specifications for Structural Concrete" (2010 edition)
- E. Comply with ACI 117-10, "Specifications for Tolerances for Concrete Construction and Materials."
- F. IDOT Standard Specifications for Road and Bridge Construction, April 1, 2016
- G. ACI 306.1-90 "Standard Specification for Cold Weather Concreting"

### 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture. Compressive strengths shall be called out on the drawings.

## PART 2 - PRODUCTS

### 2.1 FORMWORK

- A. Furnish formwork and formwork accessories according to ACI 301 (ACI 301M).

### 2.2 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
- B. Epoxy Coated Reinforcing Bars: ASTM A775/A775M and A934/A934M. All reinforcing shall be epoxy coated. No uncoated steel reinforcing permitted.
- C. Plain-Steel Wire: ASTM A 82/A 82M, as drawn.
- D. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, fabricated from as-drawn steel wire into flat sheets.
- E. Deformed-Steel Welded Wire Reinforcement: ASTM A 497/A 497M, flat sheet.

### 2.3 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source throughout Project:
  - 1. Portland Cement: ASTM C 150, Type I, Supplement with the following:
    - a. Fly Ash: ASTM C 618, Class C or F.
    - b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
- B. Normal-Weight Aggregate: ASTM C 33, graded, 1-1/2-inch nominal max aggregate size.
- C. Water: ASTM C 94/C 94M.

### 2.4 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C 260.
- B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
  - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
  - 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
  - 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
  - 4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
  - 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
  - 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

## 2.5 RELATED MATERIALS

- A. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork.

## 2.6 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming; manufactured for application to fresh concrete.
- B. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth or cotton mats.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: Silane or modified Siloxane applied to the interior side only of all exposed concrete walls.

## 2.7 CONCRETE MIXTURES

- A. Normal-Weight Concrete: Prepare design mixes, proportioned according to ACI 301, as follows:
  - 1. Minimum Compressive Strength 4500 psi at 28 days.
  - 2. Maximum Water-Cementitious Materials Ratio: 0.50.
  - 3. Cementitious Materials: Use fly ash, pozzolan, ground granulated blast-furnace slag, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by a maximum of 25 percent.
  - 4. Slump Limit: 4 inches, plus or minus 1 inch (25 mm).
  - 5. Air Content: Maintain within range permitted by ACI 301. Do not allow air content of trowel-finished floor slabs to exceed 3 percent.

## 2.8 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.
  - 1. When air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

## PART 3 - EXECUTION

### 3.1 FORMWORK

- A. Design, construct, erect, brace, and maintain formwork according to ACI 301.

3.2 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

3.3 STEEL REINFORCEMENT

- A. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
- B. All concrete base walls over 12" wide shall have a minimum concrete cover of 2" from the inside face of the wall. 12" wide or less, minimum concrete cover shall be 1-1/2",

3.4 JOINTS

- A. Isolation Joints: Install joint-filler strips at junctions with slabs-on-grade and vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
  - 1. Extend joint fillers full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.

3.5 CONCRETE PLACEMENT

- A. Comply with ACI 301 and Section 503 of IDOT Standard Specifications for placing concrete.
- B. Do not add water to concrete during delivery, at Project site, or during placement.
- C. Consolidate concrete with mechanical vibrating equipment.
- D. Cold-Weather Placement: Comply with ACI 306.1 and as follows: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions or low temperatures.
  - 1. When average high and low temperatures are expected to fall below 40 degrees F for three consecutive days, maintain delivered concrete mixture temperature with the range required by ACI 301.
  - 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
  - 3. Do not use calcium chloride, salt or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in the mixture design.
- E. Hot-Weather Placement: Comply with ACI 301 and as follows:
  - 1. Maintain concrete temperature below 90 degrees F at time of placement. Chilled mixing water or chopped ice may be used to control temperature provided water equivalent of ice is calculated to total amount of mixing water. Use of liquid nitrogen to cool concrete is at the Contractor's option.

2. Fog-spray forms, steel reinforcement and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots or dry areas.

### 3.6 FINISHING FORMED SURFACES

- A. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Remove fins and other projections exceeding 1/8 inch.
  - 1. Apply to concrete walls exposed to public view.
- B. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

### 3.7 FINISHING UNFORMED SURFACES

- A. General: Comply with ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Screed surfaces with a straightedge and strike off. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane before excess moisture or bleedwater appears on surface.
  - 1. Do not further disturb surfaces before starting finishing operations.
- C. Trowel Finish: Apply a hard trowel finish to surfaces indicated and to floor and slab surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin film-finish coating system.
- D. Nonslip Broom Finish: Apply a nonslip broom finish to exterior concrete containment pad. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom toward inlet.

### 3.8 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
  - 1. Comply with ACI 306.1 for cold-weather protection and with ACI 301 for hot-weather protection during curing.
  - 2. Comply with Section 1020.13 of the IDOT Standard Specifications for cold weather protection of structures.
- B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

- D. Curing Methods: Cure formed and unformed concrete for at least seven days by one or a combination of the following methods except where specifically noted for interior exposed concrete walls.
1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
    - a. Water.
    - b. Continuous water-fog spray.
    - c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
  2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
  3. Curing and Sealing Compound: Apply uniformly to interior exposed walls in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

### 3.9 FIELD QUALITY CONTROL

- A. Testing Agency: Using Agency, (IDOT) will perform field tests and material inspections including; sampling for strength testing to be conducted at the IDOT Material Testing Lab, measurement of concrete slump, percentage of air and material temperature.
- B. Tests: Perform according to ACI 301.
  1. Testing Frequency: One composite sample shall be obtained for each 10 cu. yd. or fraction thereof of each concrete mix placed each day.
- C. CDB Representative shall observe all steel reinforcement, forms, ties, etc...prior to placement of concrete in the forms for compliance with DBE final design documents.

### 3.10 REPAIRS

- A. Remove and replace concrete that does not comply with requirements in this Section.

END OF SECTION 033053



PART 1 - GENERAL

1.1 WORK INCLUDES

A. BASE BID:

1. Contractor Provide

- a. All miscellaneous metal fabrications as required for the project shown on the drawings and specified herein. Including;

1. Miscellaneous steel framing and supports.
2. Cast-In-Place, 4" x 4" corner protection angles on inside and outside corners of both sections of concrete base wall at rolling door opening.
3. Primed and field painted concrete filled metal bollards located inside and outside of each rolling door jamb as indicated on the drawings.

1.2 RELATED WORK

1. 03 30 53 Miscellaneous Cast-In-Place Concrete

2. 09 91 23 Painting

PART 2 - PRODUCTS

2.1 FERROUS METALS

A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

B. Steel Pipe: ASTM A 53/A 53M, standard weight (Schedule 40) unless otherwise indicated.

2.2 FASTENERS

A. Post-Installed Anchors: Torque-controlled expansion anchors.

1. Material for Exterior Locations: Unless otherwise indicated, provide Type 304 stainless steel fasteners for exterior use.

2.3 MISCELLANEOUS MATERIALS

A. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.

B. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.

- C. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

#### 2.4 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.

#### 2.5 MISCELLANEOUS STEEL TRIM

- A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.
- B. Prime miscellaneous steel trim with zinc-rich primer.

#### 2.6 METAL BOLLARDS

- A. Fabricate metal bollards from Schedule 40 steel pipe.
- B. Prime bollards with zinc-rich primer.

#### 2.7 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish metal fabrications after assembly.

#### 2.8 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.
- B. Shop prime iron and steel items unless they are to be embedded in concrete or unless otherwise indicated.
  - 1. Shop prime with universal shop primer indicated.
  - 2. Field prime all exterior exposed steel with zinc rich primer.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

3.2 INSTALLING METAL BOLLARDS

- A. Anchor bollards in place with concrete footings. Place concrete and vibrate or tamp for consolidation. Support and brace bollards in position until concrete has cured.
- B. Fill bollards solidly with concrete, mounding top surface to shed water.

3.3 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 055000

PART 1 - GENERAL

1.1 WORK INCLUDES

A. BASE BID:

1. Contractor Provides:
  - a. Standard profile fully welded, heavy gauge galvanized, (galvanealed), insulated hollow metal swing door and frame.

1.2 RELATED WORK

- A. 08 71 00 Door Hardware
- B. 09 91 23 Painting

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Include elevations, door edge details, frame profiles, metal thicknesses, preparations for hardware, and other details.

1.2 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or an approved equal as submitted to and accepted by the CDB Representative.:
  1. Ceco Door Products; an Assa Abloy Group company.
  2. Curries Company; an Assa Abloy Group company.
  3. Mesker Door Inc.
  4. Steelcraft; an Ingersoll-Rand company.
- B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum A60 metallic coating.
- C. Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), 40Z coating designation; mill phosphatized.
  1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
- D. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- E. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat.

### 1.3 HOLLOW METAL DOORS

- A. General: Comply with ANSI/SDI A250.8.
  - 1. Design: As indicated
  - 2. Core Construction: Manufacturer's insulated standard, polystyrene, polyurethane, polyisocyanurate, mineral-board, or vertical steel-stiffener core.
    - a. Thermal-Rated (Insulated) Doors: R-value of not less than 6.0 deg F x h x sq. ft./Btu when tested according to ASTM C 1363.
  - 3. Vertical Edges for Single-Acting Doors: Square edge.
  - 4. Top and Bottom Edges: Closed with flush or inverted 0.042-inch- thick, end closures or channels of same material as face sheets.
  - 5. Tolerances: SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."
- B. Exterior Doors: Face sheets fabricated from metallic-coated steel sheet. Comply with ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:
  - 1. Level 2 and Physical Performance Level B (Heavy Duty), Model 2 (Seamless), 16 gauge steel sheet
    - a. Width: 1-3/4 inches
- C. Hardware Reinforcement: ANSI/SDI A250.6.

### 1.4 STANDARD HOLLOW METAL FRAMES

- A. General: Comply with ANSI/SDI A250.8.
- B. Exterior Frames: Fabricated from metallic-coated steel sheet.
  - 1. Fabricate frames with mitered or coped corners.
  - 2. Fabricate frames as full profile welded unless otherwise indicated.
  - 3. Frames for Level 2 Steel Doors: 14 gauge steel sheet.
- C. Hardware Reinforcement: ANSI/SDI A250.6.

### 1.5 FRAME ANCHORS

- A. Jamb Anchors:
  - 1. Post installed expansion type for in-place concrete or masonry. Minimum 3/8" diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall with throat reinforcement plate welded to frame at each anchor location.

### 1.6 FABRICATION

- A. Tolerances: Fabricate hollow metal work to tolerances indicated in SDI 117.

- B. Hollow Metal Doors:
  - 1. Exterior Doors: Provide weep-hole openings in bottom of exterior doors. Seal joints in top edges of doors against water penetration.
- C. Hollow Metal Frames: Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
  - 1. Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
  - 2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
  - 3. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
  - 4. Jamb Anchors: Provide number and spacing of anchors as follows:
    - a. Four anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
  - 5. Door Silencers: Except on weather-stripped doors, drill stops to receive door silencers.
    - a. Single-Door Frames: Three door silencers.
- D. Hardware Preparation: Factory prepare hollow metal work to receive templated mortised hardware according to the Door Hardware Schedule and templates furnished as specified in 087100 Door Hardware.
  - 1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
  - 2. Reinforce doors and frames to receive non-templated, mortised and surface-mounted door hardware.
  - 3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.

## 1.7 STEEL FINISHES

- A. Prime Finish: Apply manufacturer's standard primer immediately after cleaning and pretreating.
  - 1. Shop Primer: ANSI/SDI A250.10.

## PART 2 - EXECUTION

### 2.1 INSTALLATION

- A. Hollow Metal Frames: Comply with ANSI/SDI A250.11.
  - 1. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set.
    - a. Install door silencers in frames before grouting.

- b. Remove temporary braces necessary for installation only after frames have been properly set and secured.
  - c. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
  - d. Field apply bituminous coating to backs of frames prior to being filled with grout.
2. Installation Tolerances: Adjust hollow metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
- a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
  - b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
  - c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
  - d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.
- B. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.
1. Non-Fire-Rated Standard Steel Doors:
- a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
  - b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
  - c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
  - d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.-

## 2.2 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.
- B. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- C. Metallic-Coated Surfaces: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

END OF SECTION 081113



1. GENERAL

1.1 WORK INCLUDES

A. BASE BID

1. Contractor provide 14' high x 24' wide, non-insulated, overhead rolling, (coiling) steel service door suitable for heavy-duty commercial use with motorized operation as indicated on the plans and specified herein.
  - a. Contractor to insure all product data and installation details are provided to fabric structure manufacturer to insure proper steel support is provided to anchor all components of the system to the fabric structure framing and concrete base wall as necessary.

1.2 RELATED WORK

A. Specified elsewhere:

1. 05 50 00 Metal Fabrications
2. 13 65 00 Pre-Engineered/Manufactured Fabric Structures
3. 26 05 00 Electrical Work

1.3 DESIGN / PERFORMANCE REQUIREMENTS

A. Overhead coiling service doors:

1. Wind Loads: Design door assembly to withstand wind/suction load of not less than 20 psf without damage to the door or any assembly components.
2. Operation: Design door assembly, including operator, to operate for not less than 20,000 cycles.

B. Single-Source Responsibility: Provide doors, tracks, motors and accessories from one manufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components.

C. Electrical Connections: All electrical components shall be listed and classified by UL as suitable for the purpose specified.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing Work of this section with a minimum of, three years experience ***and*** approved by the manufacturer to install their specific products.

1.5 REGULATORY REQUIREMENTS

A. ASTM Standard Specifications:

1. A 653: Zinc Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.

2. A 666: Austenitic Stainless Steel Sheet, Strip, Plate and Bar.
  3. A 924: General Requirements for Steel Sheet, Metallic Coated by the Hot-Dip Process.
  4. B 221: Aluminum and Aluminum-Alloy Extruded bars, Rods, Wire, Profiles and Tubes
- B. NEMA Standard Specifications:
1. 250: Enclosures for Electrical Equipment (1000 Volts Maximum)
  2. MG 1: Motors and Generators

#### 1.6 SUBMITTALS

- A. Product Data: Manufacturer's data sheets on each product to be used, including;
1. Construction and fabrication details.
  2. Installation instructions.
- B. Shop Drawings: Include detailed plans and elevations. Provide details of framing members, anchoring methods, required clearances, hardware and accessories. Include relationship with adjacent construction.
- C. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- D. Operation and Maintenance Data: Submit lubrication requirements and frequency as well as, periodic adjustments required.

#### 1.7 WARRANTY

- A. Manufacturer's limited door and operator system, except the counterbalance spring and finish, to be free from defects in materials and workmanship for 3 years or 20,000 cycles, whichever occurs first.
- B. Manufacturer's 2-year limited door warranty for all parts and components.

### 2. PRODUCTS

#### 2.1 ACCEPTABLE MANUFACTURERS

- A. Cornell Iron Works, Mountaintop, PA – Model: ESD10 Series
- B. Overhead Door Corporation, Lewisville, TX – Model: 610 Series
- C. Wayne-Dalton Corporation, Mt. Hope, OH – Model: SDF7 - 800 Series

2.2 OVERHEAD COILING SERVICE DOORS

- A. Curtain: Interlocking roll-formed slats. Endlocks shall be attached to each end of alternate slats to prevent lateral movement.
  - 1. Profile: Manufacturer's curved profile suitable for opening size.
  - 2. Material: 20 gauge, galvanized steel
- B. Wall Mounting Condition: Doors shall be inside face-of-wall mounted.
  - 1. Substrate anchorage for jambs and rails includes concrete base wall to 14' above floor. Head anchorage is supplemental steel members provided by fabric structure manufacturer. Coordinate with fabric structure manufacturer to insure their steel supports are properly located and sized to carry the load of the complete door and operator assembly as specified.
- C. Finish:
  - 1. Galvanized Steel: Slats, hood, guides, bottom bar and head plate galvanized in accordance with ASTM A 653 with weather resistant, polyester powder coat finish. Color selected by Architect.
    - a. Cornel Iron Works - Spectrashield
    - b. Overhead Door Corp. - Powderguard
    - c. Wayne-Dalton Corp. – Drylac Powder Coating
  - 2. Non-galvanized exposed ferrous surfaces shall receive one coat of rust inhibitive primer factory applied.
- D. Bottom Bar:
  - 1. Provide 2 galvanized steel angles, minimum 1/8" thick each to stiffen the curtain. Include vinyl loop astragal weatherseal.
- E. Guides:
  - 1. Structural steel three angle assembly to form a slot of sufficient depth to retain curtains in guides to resist 20psf windload.
- F. Brackets:
  - 1. Minimum 3/16" thick galvanized steel plates with permanently sealed ball bearings. Designed to enclose end of coil and provide support for counterbalance, curtain and hood.
- G. Counterbalance:
  - 1. Helical torsion spring type housed in a steel tube or pipe barrel, supporting the curtain with deflection limited to 0.033 inch/foot of span.
    - a. Anchor springs to tension shaft and pipe with cast iron barrel plugs.

- b. Counterbalance shall be adjustable by means of an adjusting tension wheel or other proprietary method.

H. Hood:

- 1. Minimum 24 gauge galvanized steel with intermediate supports, top and bottom flanges.
  - a. Provide manufacturer's standard weatherstrip closure.

J. Electric Motor Operation:

- 1. Provide UL listed electric operator, sized as recommended by the manufacturer to move the door in either direction at not less than 2/3 foot, nor more than 1 foot/second.
  - a. Object Sensing Protection:
    - 1. Electric sensing edge to be attached to bottom bar or infrared electronic eye sensing device mounted to jamb rails at not more than 12" above floor. Sensing protection shall stop and reverse the door when the bar contacts an object during the closing cycle or the infrared beam is broken by an object passing through it.
  - b. Operator Controls:
    - 1. Push button operation, surface mounted, control stations with open, close and stop buttons.
  - c. Motor Voltage:
    - 1. Compatible with available power source. Refer to electrical drawings and specifications.

3. EXECUTION

3.1 EXAMINATION

- A. Verify opening sizes, tolerances and conditions for installation are acceptable prior to commencing the Work.
- B. Examine conditions of substrates, supports and all other conditions under which this work is to be performed. Notify Architect of any unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for the achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Use corrosion resistant anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
- C. Securely and rigidly brace components suspended from the structure.
  - 1. Coordinate total load of assembly with fabric structure manufacturer so that bracing and framing members supplied by him are capable of supporting the assembly without distortion or stress.
- D. Fit and align assembly including hardware, level and plumb, to provide smooth operation.
- E. Coordinate installation of electrical service with Section 260500. Complete wiring from disconnect to unit components.

3.4 ADJUSTING

- A. Test for proper operation and adjust as necessary to provide proper operation without binding or distortion.
- B. Lubricate all parts as recommended by the manufacturer.
- C. Adjust hardware and operating assemblies for smooth and noiseless operation.

3.5 CLEANING

- A. Clean curtain and components using non-abrasive materials and methods recommended by the manufacturer. Remove labels and visible markings.
- B. Touch-up, repair or replace damaged products prior to Substantial Completion.

3.6 PROTECTION

- A. Protect installed products until completion of project. Coat manual operation chain with a light duty oil to prevent rust and corrosion.

END 08 33 00

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Base Bid:

1. Contractor provide mechanical door hardware for swinging man-door.

1.2 RELATED WORK:

- A. 08 11 13 Hollow Metal Doors and Frames

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers.
- B. Accessibility Requirements: For door hardware on doors in an accessible route, comply with Illinois Accessibility Code and ICC/ANSI A117.1
- C. Maximum Opening-force requirements: For exterior, non fire-rated doors, 5 lbf applied perpendicular to door.
1. Adjust door closer sweep periods so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches (75 mm) from the latch, measured to the leading edge of the door.

1.4 SUBMITTALS

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

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. Provide door hardware for one swinging man-door as scheduled in Part 3 "Door Hardware Schedule" from one of the indicated manufacturers for each product.
1. Door Hardware Sets: Provide item quantity, size, finish or color indicated of named manufacturers' products. Manufacturer and product designation are listed for each door hardware type required to establish minimum quality requirements.
  2. Provide products complying with BHMA designations and requirements for description, quality, and function.

2.2 HINGES

- A. BHMA A156.1. (5) Knuckle medium duty ball bearing stainless steel 4.5x4.5 fully mortised. US26D Finish. Provide template-produced hinges for hinges installed on hollow-metal doors and hollow-metal frames.
  
- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or an approved equal as submitted to and accepted by the CDB Representative.:
  - 1.
    - a. Hager Companies BB1191
    - b. McKinney Products Company; an ASSA ABLOY Group company TA2314
    - c. Stanley Commercial Hardware; Div. of The Stanley Works FBB191

2.3 MECHANICAL LOCKS AND LATCHES

- A. Strikes: Provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.
  
- B. Bored Locks: BHMA A156.2; Grade 2; Series 4000. Provide lever trim, interchangeable cores. Finish 626.
  
- C. Manufacturers: Subject to compliance with requirements, provide products by one of the following or an approved equal as submitted to and accepted by the CDB Representative.:
  - a. SARGENT Manufacturing Company; an ASSA ABLOY Group company (7 line LL trim)
  - b. Schlage Commercial Lock Division; an Ingersoll-Rand company (AL Series Saturn Trim)
  - c. Yale Security Inc.; an ASSA ABLOY Group company (5300LN Series, Augusta Trim)

2.4 SURFACE CLOSERS

- A. BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized architectural style closers, adjustable to meet field conditions and accessibility requirements for opening force. Finish BHMA 689.
  
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following or an approved equal as submitted to and accepted by the CDB Representative.:
  - a. Hager Companies 5200 Series
  - b. LCN Closers; an Ingersoll-Rand company 4040 Series
  - c. Norton Door Controls; an ASSA ABLOY Group company 8300 Series



## 2.5 THRESHOLDS

- A. BHMA A156.21; fabricated to full width of opening indicated compliant with Illinois Accessibility Code. Finish: Mil Aluminum
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following or an approved equal as submitted to and accepted by the CDB Representative.:
  - a. Hager Companies 4155
  - b. National Guard Products 426E
  - c. Pemko Manufacturing Co. 172A

## 2.5 DOOR SWEEP

- 1. Clear anodized finish aluminum bar 1¼” high pre-drilled, adjustable holes with ½” minimum exposure neoprene sweep (black or grey).
- C. Manufacturers: Subject to compliance with requirements, provide products by one of the following or an approved equal as submitted to and accepted by the CDB Representative.:
  - 1.
    - a. National Guard Products  
(Frame Seal: 5050C; Door Sweep 200NSS)
    - b. Pemko Manufacturing Co.; an ASSA ABLOY Group company  
(Frame Seal: 588BL; Door Sweep 315 CN)
    - c. Reese Enterprises, Inc.  
(Frame Seal: 797B; Door Sweep: 362C)

## 2.6 AUXILIARY DOOR HARDWARE

- A. Frame Mutes: BHMA A156.16. Neoprene Push-in type ½” diameter.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following or an approved equal as submitted to and accepted by the CDB Representative.:
  - 1.
    - a. Ives SR64
    - b. Glynn-Johnson GJ64
    - c. Don-Jo 1608

## 2.7 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.
  - 1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.

2.8 FINISHES

- A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.
- B. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations.
  - 1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
- C. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 09 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
  - 1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
  - 2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- D. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than the number recommended by manufacturer for application indicated.
- E. Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.2 HARDWARE SCHEDULE

- A. Door Hardware Set No. 1: Provide for swinging man-door only.

<u>Qty.</u>	<u>Item</u>
3	Hinges
1	Passage Lockset
1	Closer
1	Door Sweep
1	Threshold
3	Frame Mutes

END SECTION

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Base Bid:

1. Contractor shall size and provide fixed, extruded-aluminum or formed-metal louvers for fresh air intake, exhaust and wall mounted propeller exhaust fan to meet the volume requirements of the building size specified by the award of the project.

1.2 Related Work:

- A. 13 65 00 Pre-Engineered/Manufactured Fabric Structures
- B. 23 05 00 Ventilation Work
- C. 26 05 00 Electrical Work

1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Louvers shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated without permanent deformation of louver components, noise or metal fatigue caused by louver blade rattle or flutter, or permanent damage to fasteners and anchors.
  1. Wind Loads: Determine loads based on pressures as indicated on Drawings.
  2. Wind Loads: Determine loads based on a uniform pressure of 30 lbf/sq. ft. (1436 Pa), acting inward or outward.
- B. Louver Performance Ratings: Provide louvers complying with requirements specified, as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width according to AMCA 500-L.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
  1. Include manufacturer's full-range color chart.
- B. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other work. Show frame profiles and blade profiles, angles, and spacing.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Aluminum Extrusions: ASTM B 221, Alloy 6063-T5, T-52, or T6.

- B. Aluminum Sheet: ASTM B 209, Alloy 3003 or 5005 with temper as required for forming, or as otherwise recommended by metal producer for required finish.
- C. Galvanized-Steel Sheet: ASTM A 653/A 653M, G60 zinc coating, mill phosphatized. Exterior galvanized shall be painted. Color shall be approved by architect/owner from manufacturer's standard range.
- D. Fasteners: Use types and sizes to suit unit installation conditions.
  - 1. For fastening aluminum, use aluminum or 300 series stainless-steel fasteners.
  - 2. For fastening galvanized steel, use hot-dip-galvanized steel or 300 series stainless-steel fasteners.
  - 3. For color-finished louvers, use fasteners with heads that match color of louvers.

## 2.2 FABRICATION, GENERAL

- A. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.
- B. Join frame members to each other and to fixed louver blades with fillet welds, threaded fasteners, or both, as standard with louver manufacturer unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

## 2.3 FIXED, EXTRUDED-ALUMINUM LOUVERS

- A. Horizontal Storm-Resistant Louver
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following or an approved equal as submitted to and accepted by the CDB Representative.:
  - 1.
    - a. Air Balance Inc.; a Mestek company.
    - b. Greenheck Fan Corporation.
    - c. Ruskin Company; Tomkins PLC.
  - 2. Louver Depth: Coordinate with fabric structure manufacturer.
  - 3. Frame and Blade Nominal Thickness: Not less than 0.060 inch for blades and 0.080 inch for frames.
  - 4. Louver Performance Ratings:
    - a. Free Area: Not less than 14.5 sq. ft. for 80-inch- wide by 50-inch- high louver.
  - 5. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

## 2.4 FIXED, FORMED-METAL LOUVERS

- A. Horizontal, Drainable-Blade Louver
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following or an approved equal as submitted to and accepted by the CDB Representative.:
  - a. Air Balance Inc.; a Mestek company.
  - b. Greenheck Fan Corporation.

- c. Ruskin Company; Tomkins PLC.
- 2. Louver Depth: Coordinate with fabric structure manufacturer.
- 3. Frame and Blade Material and Nominal Thickness: Galvanized-steel sheet, not less than 0.052 inch for frames and 0.040 inch for blades.
- 4. Frame and Blade Material and Nominal Thickness: Stainless-steel sheet, not less than 0.050 inch.
- 5. Louver Performance Ratings:
  - a. Free Area: Not less than 14.5 sq. ft. for 80-inch- wide by 50-inch- high louver.
- 6. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

## 2.5 LOUVER SCREENS

- 1. Provide manufacturer's standard bird screens at each exterior louver constructed of aluminum or stainless steel mesh, not to exceed ½" x ½" pattern, using wire not less than 1.25mm secured in a metal frame that is the same kind and form of metal indicated for the louver to which the screen is attached.

## 2.6 ALUMINUM FINISHES

- A. High-Performance Organic Finish: 3-coat fluoropolymer finish complying with AAMA 2604 and containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions. Color and gloss as selected by Architect from manufacturer's full range.

## 2.7 GALVANIZED-STEEL SHEET FINISHES

- A. Finish louvers after assembly.
- B. Surface Preparation: Clean surfaces with nonpetroleum solvent so surfaces are free of oil and other contaminants. After cleaning, apply a conversion coating suited to the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas and repair according to ASTM A 780.
- C. Baked-Enamel or Powder-Coat Finish: Immediately after cleaning and pretreating, apply manufacturer's standard 2-coat, baked-on finish consisting of prime coat and thermosetting topcoat, with a minimum dry film thickness of 1 mil for topcoat. Comply with coating manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 2 mils. Color and gloss as selected by Architect from manufacturer's full range.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Locate and place louvers and vents level, plumb, and at indicated alignment with adjacent work using concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.
- B. Provide perimeter reveals and openings of uniform width for sealants and joint fillers.

DIVISION 08 – OPENINGS  
Section 089000—Louvers and Vents

- C. Repair damaged finishes so no evidence remains of corrective work. Return items that cannot be refinished in the field to the factory and refinish entire unit or provide new units.
- D. Protect galvanized and nonferrous-metal surfaces that will be in contact with concrete, masonry, or dissimilar metals from corrosion and galvanic action by applying a heavy coating of bituminous paint.

END OF SECTION 089000

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Base Bid:

1. Contractor provide surface preparation and the application of paint systems on the following substrates.
  - a. Galvanized hollow metal swing doors and frames.
  - b. Primed steel pipe bollards
  - c. Galvanized embedded corner gurds
  - d. Concrete (interior salt fill line)

1.2 RELATED WORK

- A. 03 30 53 Miscellaneous Cast-In-Place Concrete
- B. 05 50 00 Metal Fabrications
- C. 08 11 13 Hollow Metal Doors and Frames

1.3 QUALITY ASSURANCE

A. MPI Standards:

1. Products: Complying with MPI standards indicated and listed in "MPI Approved Products List."
2. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples: For each finish and for each color and texture required.

PART 2 - PRODUCTS

2.1 PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.



- B. VOC Content of Field-Applied Interior Paints and Coatings: Provide products that comply with the following limits for VOC content, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24); these requirements do not apply to paints and coatings that are applied in a fabrication or finishing shop:
  - 1. Non-flat Paints, Coatings, and Primers: VOC content of not more than 150 g/L.
- C. Chemical Components of Field-Applied Interior Paints and Coatings: Provide topcoat paints and anti-corrosive and anti-rust paints applied to ferrous metals that comply with the following chemical restrictions; these requirements do not apply to paints and coatings that are applied in a fabrication or finishing shop:
  - 1. Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
- D. Colors: As selected by Architect from manufacturer's full range except pipe bollards, embedded corner protection and salt fill line shall all be manufacturer's commercial/industrial premixed "Safety Yellow".
- E. Products
  - 1. Provide complete 2 or 3 step paint application process from one manufacturer. Subject to compliance with requirements, provide products by one of the following or an approved equal as submitted to and accepted by the CDB Representative.:
    - a. BM: Benjamin Moore
    - b. P&L: Pratt & Lambert
    - c. PPG: Pittsburg Paints
    - d. SW: Sherwin Williams

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.
- B. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- C. Begin coating application only after unsatisfactory conditions have been corrected, surfaces are dry and ambient weather conditions meet or exceed the paint manufacturer's minimum requirements
  - 1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

#### 3.2 PREPARATION AND APPLICATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates indicated.

- B. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants.
  - 1. Remove incompatible primers and re-prime substrate with compatible primers as required to produce paint systems indicated.
- C. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- D. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- E. Prepare surfaces in accordance with manufacturer's instructions for specified coatings and indicated materials, using only methods and materials recommended by the coating manufacturer.
- F. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

### 3.3 INTERIOR PAINTING SCHEDULE

- A. Concrete Surface: (salt fill line)
  - 1. Semi-Gloss Finish – High Performance Acrylic-Latex System: (MPI INT 9.2B)
    - a. Prime Coat: Interior Latex Block Filler
    - b. Intermediate Coat: Acrylic Semi-gloss enamel. (MPI 141)
    - c. Topcoat: Latex: Acrylic Semi-Gloss enamel. (MPI 141)

### 3.4 EXTERIOR PAINTING SCHEDULE

- A. Exposed Structural Steel Substrates and all Ferrous Metals: (including embeded angles and pipe bollards)
  - 1. Semi-Gloss Finish Acrylic-Enamel System:
    - a. Prime Coat: Acrylic metal primer. (MPI 107)
    - b. Intermediate Coat: Acrylic Semi-gloss enamel. (MPI 141)
    - c. Topcoat: Latex: Acrylic Semi-Gloss enamel. (MPI 141)
- B. Galvanized Hollow Metal Doors and Frames:
  - 1. Semi-Gloss Finish Acrylic-Enamel System:
    - a. First Coat: Acrylic Semi-gloss enamel. (MPI 141)
    - b. Second Coat: Acrylic Semi-Gloss enamel. (MPI 141)

END OF SECTION 099123

DIVISION 13 – SPECIAL CONSTRUCTION  
**Section 13 65 00 – Pre-Engineered/Manufactured Fabric Structures**

1. GENERAL

1.1 WORK INCLUDES

A. BASE BID:

1. Contractor shall provide all labor including engineering as well as all materials, equipment, incidentals, warranties and guarantees for the design, manufacture and installation of a clear span, tensioned, fabric membrane covered, high tensile strength, pre-galvanized clear coated steel truss type frame structure, anchored to a steel reinforced concrete base wall whose overall dimensions measure approximately 84' wide x 200' long x 14' high, (clear interior hold dimensions are 80' wide x 197' long) with steel reinforced foundation wall and footings, including two steps in the footing as indicated on the drawings.
  - a. Contractor shall be responsible for the design of the reinforced concrete base wall, foundations and footings and shall consider soil type and conditions as well as all dead and live loads including reactions from the fabric structure manufacturer plus, the outward natural force of the salt stored and the "push" action of the salt loading equipment. Concrete wall width indicated on plans is subject to modification by the foundation/base designer and to meet standard modular span fabrications of the selected manufacturer.
    1. Base wall design must comply with IBC 2015, (including ASCE 7-10 and ACI 318-11 by reference) and all local, state and federal requirements applicable.
    2. Alterations to the indicated height of the reinforced concrete base wall above the Finished Floor line are prohibited.
  - b. Fabric structure manufacturer shall be responsible for the design of the anchoring system required to attach the fabric structure to the reinforced concrete base.
  - c. Fabric structure manufacturer shall be responsible for the design of the end wall steel framing to not only support the structure but also the coiling overhead door, ventilation exhaust fan assembly and the intake and exhaust ventilation louvers. Coordinate with the suppliers of this equipment for their specific requirements.

B. ALTERNATE BID G-1:

1. Contractor shall extend the base bid building fifteen feet, (15') by placing the south wall 15' farther south.

C. ALTERNATE BID G-2:

1. Contractor shall extend the base bid building thirty feet, (30') by placing the south wall 30' farther south.

DIVISION 13 – SPECIAL CONSTRUCTION  
**Section 13 65 00 – Pre-Engineered/Manufactured Fabric Structures**

1.2 DESCRIPTION OF SYSTEM

- A. Fabric structure shall include the following principal features:
1. Half-Round Style, structural truss frame with membrane fabric cladding system tensioned over the structural framework and anchored to the reinforced concrete base wall. No exterior purlins, guy ropes or cables shall be used for anchoring the structure. Top truss chord should be rounded or otherwise designed to minimize stress and abrasion to the fabric cover.
  2. Two, flat vertical end walls with provisions for coiling door and ventilation equipment as indicated on the plans.
  3. The interior of the structure, below the trusses shall be clear of any structural support members.
  4. The cover system shall be provided with a mechanical tensioning system that allows the fabric membrane to be fully tensioned vertically, horizontally and around the structure perimeter.
  5. The covering system shall be designed in such a way to permit repairs, removal and replacement of the fabric without removing the entire roof covering.

1.3 RELATED WORK

- A. Specified elsewhere:
1. 03 30 53 Cast-In-Place Concrete
  2. 08 33 00 Overhead Rolling Service Doors
  3. 08 90 00 Louvers and Vents
  4. 23 05 00 Ventilation Work
  5. 26 05 00 Electrical Work

1.4 DESIGN / PERFORMANCE REQUIREMENTS

- A. The structure shall be designed in accordance with appropriate standards using methodology from ASCE 7-10 as it applies for the geographical area of the project.
1. Structure shall be classified as Category I, Surface Roughness B, Exposure B.
    - a. Occupancy Class: U - Utility and Miscellaneous Group
  2. Structure shall not be engineered to assume all snow slides off the roof.
    - a. Ground snow load shall be based on CDB standard of 30 psf.
  3. Structure shall be designed to be capable of withstanding the effects of rainfall up to 4 inches per hour for at least two hours.

DIVISION 13 – SPECIAL CONSTRUCTION  
**Section 13 65 00 – Pre-Engineered/Manufactured Fabric Structures**

4. Structure shall be designed to take into consideration the proximity of other buildings on the site and how wind, snow and rain may affect the structure due to this proximity.
- B. Structure Manufacturer shall employ an independent third party Illinois Licensed Structural Engineer to review and confirm that all load calculations are in conformance with the ASCE 7-10 standard.
- C. Structure Manufacturer shall submit a full Structural Load Report prepared by the independent third party engineer certifying that the structure meets the requirements of ASCE 7-10, local building code and CDB additional loading requirements. (IBC 2015).
- D. The Structural Load Report and all fabrication and erection drawings shall be signed and sealed by the independent third party Structural Engineer. Signature shall include date signed and date of license expiration.
- E. Structure framing shall include all steel framing members required to properly support and anchor natural ventilation louver assemblies, exhaust fan and louver assembly, electrical lighting and rolling overhead garage door assembly, all as indicated on the drawings.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in performing Work of this section with a minimum of five years direct experience in design, manufacture and installation of structures of the type specified herein. The structure shall be manufactured under factory conditions in a plant specifically arranged for this type of work.
  1. Manufacturer shall submit evidence of compliance with IBC 2015 Section 1704.2.5.2 “Fabricator Approval”.
  2. Contractor shall provide and make all arrangements for the Manufacturer to provide a Manufacturer’s Technical Representative on-site throughout the installation of the work specified herein to observe the work as it is being installed and to offer technical instruction as required.
    - a. Technical Representative shall prepare a summary of the work performed each day they are on-site with a statement of compliance that all work was installed in accordance with the Manufacturer’s written procedures, as well as all reviewed and accepted fabrication and installation submittals.
      1. Any specific instruction provided to the installing contractor shall be documented in the summary regardless if it deviates or reinforces policy, procedure or submittals already in place and accepted for use on this project.
        - a. Contractor shall forward each summary to the Architect electronically, within 24 hours of the work being performed.

DIVISION 13 – SPECIAL CONSTRUCTION  
**Section 13 65 00 – Pre-Engineered/Manufactured Fabric Structures**

- B. Manufacturer’s Technical Representative Qualifications: Individual(s) with not less than five years experience, (at least two years of which are with the selected manufacturer) in engineering, designing, fabricating, installing and/or observing installations of similar structures as specified herein and has completed specific training provided by the selected manufacturer in order to serve as a technical representative of their structures.
- C. Steel Frame Installation Contractor Qualifications: Contractor that regularly engages in erection of structural steel frame buildings of a comparable magnitude to the structure specified herein.
  - 1. All required field welding must be performed by AWS Certified Welders experienced in fitting and welding galvanized high tensile strength steel.
- D. Roof Fabric Installation Contractor Qualifications: Contractor experienced with the installation of single-ply, engineered fabric roof systems.

1.6 REGULATORY REQUIREMENTS

Comply with most recent published edition of each.

- A. AISC American Institute of Steel Construction:
  - 1. 325-11 Manual of Steel Construction – Fourteenth Edition
  - 2. 2010 Code of Standard Practice for Structural Steel Buildings
  - 3. 2009 RCSC Specification for Structural Joints Using High-Strength Bolts
- B. AISI American Iron and Steel Institute:
  - 1. SO 503 The Design and Fabrication of Cold Formed Steel Structures
- C. ASTM American Society for Testing and Materials
  - 1. A36 Structural Steel
  - 2. A123-A Specification for Zinc (Hot Dipped Galvanized) Iron and Steel Products
  - 3. A307 Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength
  - 4. F3125 High-Strength Bolts for Structural Steel Joints
  - 5. A500-A Specification for Cold Formed Welded and Seamless Structural Tubing
  - 6. A-563-A Carbon and Alloy Steel Nuts
  - 7. A687 High-Strength Non-Headed Steel Bolts and Studs
- D. ASCE American Society of Civil Engineers
  - 1. ASCE 7-10 Minimum Design Loads for Buildings and Other Structures

DIVISION 13 – SPECIAL CONSTRUCTION  
**Section 13 65 00 – Pre-Engineered/Manufactured Fabric Structures**

- E. AWS American Welding Society
  - 1. DI.1 Structural Welding Code-Steel
  - 2. DI.3 Structural Welding Code-Steel Sheet Steel

1.7 SUBMITTALS

- A. Product Data: Manufacturer's data sheets on each product to be used, including;
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Construction and fabrication details.
  - 4. Installation instructions.
  - 5. Certification of compliance with IL Steel Products Procurement Act.
- B. Shop Drawings: Include detailed plans and elevations. Provide details of framing members, anchoring methods, required clearances, hardware and accessories. Include relationship with adjacent construction.
  - 1. Shop Drawings must be signed and sealed by an independent third party, Illinois Licensed Structural Engineer.
- C. Structural Load Report: Prepared, signed and sealed by the independent third party engineer certifying that the structure meets the requirements of ASCE 7-10 and the local building code with CDB additional loading requirements. (IBC 2015).
- D. Fabric Samples: Submit actual samples meeting all aspects of the specification including color selected, UV resistance and fire retardant treatment.
- E. Installation Schedule delineating work to be performed and block of time required to complete each task for purposes of observing the work as it is installed.
- F. Operation and Maintenance Data: Submit inspection requirements and frequency, as well as periodic adjustments required to maintain specified warranties.
- G. Statement or other evidence of compliance with IBC 2015 Section 1704.2.5.2.
- H. Written evidence that the Manufacturer's Technical Representative and that the installing contractor meet or exceed the minimum qualifications for this project as specified in Part 1.5 of this specification.
  - a. Provide professional resume or CV of each Technical Representative proposed for this project. Include an outline or summary of specific experience and training completed to qualify each individual.
  - b. Submit evidence of on-site welders AWS qualifications.



DIVISION 13 – SPECIAL CONSTRUCTION  
**Section 13 65 00 – Pre-Engineered/Manufactured Fabric Structures**

1.8 WARRANTY

- A. Structure Manufacturer: Standard limited warranty for all parts and components to be free from defects in materials and workmanship for a period of five (5) years.
- B. Fabric Manufacturer:
  - 1. Manufacturer's Standard twenty (20) year pro-rated warranty.
- C. Steel Fabricator: Manufacturer's standard corrosion protection warranty.

2. PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Subject to full compliance with the provisions indicated herein;
  - 1. Clear Span Fabric Structures, South Windsor, CT  
Sales Rep: Brad Williams, Truss Arch Specialist  
800-603-4445 ext. 1241  
[bwilliams@clearspan.com](mailto:bwilliams@clearspan.com)
  - 2. Norseman Structures, Saskatoon, SK, Canada  
855-385-2782 / 306-249-1889 (fax)
  - 3. Shelter Structures, Inc., Philadelphia, PA  
800-330-9294 / 267-590-4143 (fax)
  - 4. Big Top Fabric Structures, Perry, FL  
Sales Rep: Carl Padgett  
850-584-7786  
[c.padgett@bigtopshelters.com](mailto:c.padgett@bigtopshelters.com)
  - 5. Accu-Steel Fabric Covered Buildings, Templeton, IA  
Sales & Installation:  
Greenfield Contractors, LLC, Princeville, IL  
Lucas Young, Project Manager  
309-370-8587  
[lyoung@greenfield-contractors.com](mailto:lyoung@greenfield-contractors.com)
  - 6. Britespan Building Systems, Inc., Lucknow, Ontario Canada  
800-407-5846  
Sales: Friedman Farm Supply, Belle Plaine, IA  
319-444-3477

2.2 TRUSS STEEL

- A. Truss chords and webbing shall be fabricated from triple coated, in-line method galvanized clear coated steel. The main structure shall consist of welded open web round or square tube arch trusses with parallel truss chords. Sheared, flattened or distorted tubing is prohibited.

DIVISION 13 – SPECIAL CONSTRUCTION  
**Section 13 65 00 – Pre-Engineered/Manufactured Fabric Structures**

- B. All steel tubing shall be fabricated per ASTM A-500. Tension Ultimate: 55 KSI and Yield: 50 KSI
- C. All steel plates, tabs and lugs shall be fabricated from hot dipped galvanized material meeting ASTM A572 GR44: Tensile: 50 KSI, Yield: 44 KSI

2.3 HARDWARE

- A. Bolts: All bolts used at truss connections, wind post connections, purlins and horizontal braces shall be galvanized ASTM F3125 grade bolts. All bolts shall be securely torqued to prevent change in tightness.
- B. Fabric Membrane Tensioning Hardware: The membrane shall be tensioned with zinc chromate plated, or stainless steel load rated hardware. Hardware shall allow full and free rotation of the foundation connection to avoid fatigue failure of threaded assembly.
- C. Fabric Membrane Tensioning Webbing: Fabric shall be tensioned using 10,000 pound zero stretch webbing.
- D. Cable Assemblies: Bracing cables shall be galvanized “aircraft cable” tensioned using forged turnbuckles of sufficient size to meet project requirements for each application.
  - 1. Cable clamps shall be drop forged with thimbles used in each cable termination.
  - 2. Cable terminations shall be to tabs or plates welded to the arch truss chords.

2.4 PURLIN BRACING

Arch trusses shall be braced laterally by tubular purlins at intervals required by the truss design. Purlins shall brace both inside and outside truss chords.

2.5 CONNECTING JOINTS

Connections between structural elements shall be designed so as to transfer the compressive and tensile forces present in a given joint.

- 1. Truss chord joints, purlins, end wall wind post and horizontal bracing connections shall be made with not less than 5/8” diameter F3125 grade bolts.
- 2. Truss chord joints shall be connected using a minimum of four (4) bolts.

2.6 FABRIC MEMBRANE

- A. Acceptable Manufacturers:
  - 1. Mehler Technologies – Martinsville, VA
  - 2. Naizil Textil Architecture – Bolton, Ontario Canada
  - 3. Seaman Corporation - Wooster, Ohio
  - 4. Serge Ferrari North America – Ft. Lauderdale, FL
- B. The fabric membrane shall form a continuous, uninterrupted, weather tight shell over the framework. The membrane shall be assembled and tensioned in a manner to eliminate wrinkles in hot and cold temperatures.

DIVISION 13 – SPECIAL CONSTRUCTION  
**Section 13 65 00 – Pre-Engineered/Manufactured Fabric Structures**

- C. All roof, end walls and connecting sections shall be weather tight.
- D. Fabric Membrane: shall be a high performance translucent PVC fabric material coated to be fire retardant in accordance with NFPA 701 and UV protected. PVC fabric material shall be suitable and specifically manufactured for use in long-life fabric tensioned steel structures. Fabric shall be constructed to provide a minimum useful life of 25 years and include fabric manufacturer's standard 20-year pro rated warranty.
  - 1. Minimum total fabric weight: 28 oz./square yard
  - 2. Exterior Color: White Interior Color: White

2.7 FABRIC ATTACHMENT SYSTEM

- A. The attachment and tensioning system shall be designed such that the membrane can be tightly and neatly secured over the structural frame and such that the system has remaining range of adjustment.
  - 1. Fabric cover shall be tensioned vertically, horizontally and around the structure perimeter using a ratcheting system as per manufacturer's standard design.
  - 2. Fabric panels shall be supplied with overlap joints to allow the panels to be sealed together. Panel joining shall be as per fabric manufacturer's recommendation.
- 2.6 Fabric Panels should be installed in such a manner as to permit repair and replacement of a single panel without removal of multiple panels or the complete fabric panel system.
- B. The structure shall be supplied with all materials necessary to fully tension and seal the membrane material around all doors and ventilation openings as well as the structure perimeter below the tensioning system. This seal shall provide a neat and finished appearance and eliminate any loose membrane fabric that could otherwise be damaged by flapping or abrasion.
- C. The fabric membrane shall not be designed to function as a structural member such that, should any damage or penetration of the membrane occur, the integrity of the structural framework shall not be affected.

3. EXECUTION

3.1 EXAMINATION

- A. Verify opening sizes, tolerances and conditions for installation are acceptable prior to commencing the Work.
- B. Examine conditions of substrates, supports and all other conditions under which this work is to be performed. Notify Architect of any unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.

DIVISION 13 – SPECIAL CONSTRUCTION  
**Section 13 65 00 – Pre-Engineered/Manufactured Fabric Structures**

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

3.3 HANDLING AND DELIVERY

- A. The installing contractor shall be responsible for unloading, storage, protection and transfer to the work area of all materials and equipment required to perform the work.
  - 1. Care shall be taken to insure materials are not dropped, thrown or dragged over the transport equipment or the ground.
  - 2. Particular care shall be given to protecting the finish of the components during handling and erection.
  - 3. Hardware and fabric panels should be protected from the weather until installation is underway and the materials will be readily incorporated into the work.

3.4 INSTALLATION

- A. Install in accordance with manufacturer's installation instruction manual furnished with materials.
- B. Members shall be braced adequately at all stages of installation to hold them in safe positions until full stability is achieved.
  - 1. The contractor is responsible for providing all temporary bracing, shoring and/or support that may be required as the result of Erector's construction methods and/or sequences.
- C. Framing shall be installed to manufacturer's suggested tolerances, set accurately to the required lines and levels and secured in accordance with the manufacturer's printed instructions.
  - 1. Bolting shall be done in an approved manner and tightened as recommended by the manufacturer.
  - 2. No opening, (other than those shown on the drawings) shall be made in any structural member and no modification or alteration shall be made to any structural member without written approval of the manufacturer's design engineer

3.5 PAINTING AND TOUCH UP

- A. After shop fabrication, touch up all welds, abraded areas and scratches with cold galvanizing compound consistent with steel tube manufacturer's recommendations for color and composition. Prior to touch-up; clean welded and abraded areas with a wire brush to remove slag and loose particles. Surfaces must be clean and oil free.
- B. After field installation, touch-up all abraded areas, scratches, field welds, bolted connections and attachments with cold galvanizing compound of the same composition and color used for shop coating. Spray application of zinc coatings is prohibited.

DIVISION 13 – SPECIAL CONSTRUCTION  
**Section 13 65 00 – Pre-Engineered/Manufactured Fabric Structures**

3.6 ADJUSTING

- A. Test for proper membrane tensioning in all directions. Adjust as necessary to provide proper operation without binding or distortion.

3.7 PROTECTION

- A. Protect installed products until completion of project.

END 13 65 00

1. GENERAL

1.1 WORK INCLUDES

A. BASE BID

1. Contractor shall size and provide passive and active ventilation systems as shown on the drawings and as specified herein.

B. ALTERNATE BID G-1

1. Contractor shall size and provide all ventilation equipment specified herein to accommodate the 15' extension to the base bid building.

C. ALTERNATE BID G-2

1. Contractor shall size and provide all ventilation equipment specified herein to accommodate the 30' extension to the base bid building.

1.2 QUALITY ASSURANCE

A. Contractor Responsibilities:

1. Responsibilities include sizing necessary equipment to complete the design intent. Fabricating, and installing a passive and active ventilation and control system as herein specified and shown on the drawings.

1.3 RELATED WORK

- A. 05 50 00 Metal Fabrications
- B. 08 90 00 Louvers and Vents
- C. 13 34 19 Pre-Engineered Manufactured Fabric Structures
- D. 26 05 00 Electrical Work

1.4 REGULATORY REQUIREMENTS

1. American Society for Testing and Materials
  - a. ASTM C 1107-97: Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
  - b. ASTM C 1173-97: Specification for Flexible Transition Couplings for Underground Piping Systems
  - c. ASTM D 1785-96b: Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120
  - d. ASTM D 2235-96a: Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings
  - e. ASTM D 2564-96a: Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems
  - f. ASTM D 2672-96a: Specification for Joints for IPS PVC Pipe Using Solvent Cement

- g. ASTM D 2855-96: Practice for Making Solvent-Cemented Joints with Poly(Vinyl Chloride) (PVC) Pipe and Fittings
  - h. ASTM D 3139-98: Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals
  - i. ASTM F 402-93: Practice for Safe Handling of Solvent Cements, Primers, and Cleaners Used for Joining Thermoplastic Pipe and Fittings
  - j. ASTM F 493-97: Specification for Solvent Cements for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe and Fittings
  - k. ASTM F 656-96a: Specification for Primers for Use in Solvent Cement Joints of Poly(Vinyl Chloride) (PVC) Plastic Pipe and Fittings
- 2. American Welding Society
    - a. AWS A5.8-92: Specification for Filler Metals for Brazing and Braze Welding
    - b. AWS D1.1-98: Structural Welding Code--Steel
    - c. AWS D10.12-89: Recommended Practices and Procedures for Welding Low Carbon Steel Pipe
    - d. Brazing Handbook. Latest Edition.
  - 3. ASME International
    - a. ASME B1.20.1-83 (Reaffirmed 1992): Pipe Threads, General Purpose (Inch)
    - b. ASME B16.21-92: Nonmetallic Flat Gaskets for Pipe Flanges
    - c. ASME B18.2.1-96: Square and Hex Bolts and Screws--Inch Series
    - d. ASME B31 Series: Code for Pressure Piping
    - e. 1ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications"
  - 4. Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.
    - a. MSS SP-107-91: Transition Union Fittings for Joining Metal and Plastic Products

#### 1.5 SUBMITTALS

- A. Design Drawing Elevations indicating location of all intake/exhaust louvers and the exhaust fan.
- B. Shop Drawings: Submit shop drawings for the following equipment:
  - 1. Exhaust Fan
  - 2. Carbon Monoxide Sensors
  - 3. Carbon Monoxide detection system control panel
  - 4. Louvers
  - 5. Dampers
  - 6. Controls
  - 7. Low Voltage Control Wiring Schematic
- C. Product Data: Submit manufacturer's data for:
  - 1. Exhaust Fan
  - 2. Carbon Monoxide Sensors
  - 3. Carbon Monoxide detection system control panel
  - 4. Louvers
  - 5. Dampers
  - 6. Controls
  - 7. Low Voltage Control Wiring

8. EF-1 Starter Motor

D. Test and balance drawings and reports.

1.6 DESIGN CRITERIA

A. Outside Temperatures

1. Heating: -10° F (97.5% ASHRAE Design Conditions).
2. Cooling: 91° F DB, 74° F WB at mean coincident wet bulb (2.5% ASHRAE Design Conditions), 78° F WB for cooling tower (1% ASHRAE Design Condition).

D. Air Handling Devices Noise Levels: Noise levels of equipment, ducts, grilles, registers, diffusers, dampers, air valves, terminal units, and accessories in occupied spaces shall meet NC-40 performance, except as noted. Noise Criteria (NC) curves are indicated in the ASHRAE Handbook.

2. PRODUCTS

2.1 FACTORY FINISHING

A. Painting: Equipment shall be provided with standard factory finish coating. Unless specified otherwise, the minimum finish for materials shall be as follows:

1. Factory applied baked enamel finish on equipment shall be hard enamel finish, not tinted primers.
2. Finished coatings shall be a minimum 3 mil dry thickness.

2.2 INSERTS

A. Inserts for support of ductwork shall be similar as those specified for piping, and shall conform to requirements of SMACNA's Duct Construction Standards.

2.3 DUCT AND EQUIPMENT SUPPORTS

A. Furnish and install all necessary equipment supports or hangers, which shall include all structural steel members and shapes, standards, rods, nuts, bolts, concrete inserts, expansion shields, beam clamps as indicated or required to support and/or suspend all equipment, in a manner as approved and acceptable to the Architect and the Fabric Structure Manufacturer.

1. Provide supports of which materials, design, and manufacture comply with ANSI/MSS SP-58, and MSS SP-69.
2. All supports shall be of corrosive resistant materials such as stainless steel, galvanized steel or aluminum. Black iron is not acceptable unless it is coated with a zinc rich primer and finish coated with an enamel based factory finished coating.



B. Acceptable Manufacturers:

1. Subject to compliance with requirements, provide products by one of the following or an approved equal as submitted to and accepted by the CDB Representative.:
  - a. B-Line Systems, Inc.
  - b. Grinnell Supply Sales Co.
  - c. Fee & Mason Mfg. Co.
  - d. The Michigan Hanger Co.

C. Hanger rod sizes and hanger spacing shall be in accordance with the following table:

1. 

Nominal Pipe Size	Maximum Span	Minimum Rod Diameter
Inches	Feet	Inches
3/4	5	3/8
1	7	3/8
1-1/2	9	3/8
2	10	3/8
2. Maximum hanger spacing shall be 10', with at least one hanger for each section. Hangers shall be located adjacent to joints, changes in direction and branch connection.

2.4 AIR DISTRIBUTION

A. Provide all air distribution work necessary for the construction of the project as indicated on the Drawings and specified herein. Such work includes, but is not limited to the following:

1. Natural Ventilation of the Building. Intake louvers shall be installed in the South and North Face of the Building for natural cross ventilation of the building.
2. Mechanical ventilation consisting of South wall intake louvers and a mechanical propeller style sidewall exhaust system with discharge louver, control panel, motor starter, controls and wiring with dampers as shown on the drawings (North end of building), including air balancing the system.
3. Carbon Monoxide sensors with CO detection system, wiring and control panel. Upon detection of CO (25 PPM adjustable) the Carbon Monoxide system shall activate mechanical exhaust fan, close the motorized dampers closest to the fan and the fan shall exhaust the space/building. The CO control panel shall have a manual override switch where a user can manually "turn on" the exhaust fan at any time.
5. The structural steel supports for equipment.
6. All hangers, supports, dampers, louvers, controls, wiring, etc.
7. All motorized dampers and controls shall be fully compatible with 24V actuators and transformers furnished, installed and wired as required to deliver a fully functional ventilation and CO detection control system.

B. FAN MOTORS

1. Furnish a motor for each fan unit of size and rpm required.
2. Motors shall be complete with adjustable slide rail base.

### C. V-BELT DRIVES

1. Provide belt drives for all fan units that are not direct connected to motors. Each drive shall consist of fan and motor sheaves and a minimum of two (2) matched and identical "B" or "C" V-belts rated for 1.5 times the horsepower nameplate rating of the motor. Motor sheaves for motors 10 HP and smaller shall be of the adjustable type. Larger motors shall have fixed diameter sheaves, but if it is necessary to change the rpm of the unit to deliver the air quantities listed, the drive shall be removed and replaced with properly sized sheaves and belts.
2. Fans with inlet vanes shall have fixed diameter sheaves.
3. Pulley ratio shall not exceed 5 to 1.
4. Drives shall be fan manufacturer's standards.

### D. CARBON MONOXIDE DETECTION SYSTEM

1. Furnish and install all required wiring, controls, logic, programming, and CO detection control panel, etc. to deliver a fully functional Carbon Monoxide Detection System which shall activate exhaust fan and open intake louver upon CO set point being reached.
2. System shall be a low voltage dual relay, electronic system for parking garage/warehouse use with connection for up to 12 points/detectors and shall be able to activate an exhaust fan and motorized damper actuator.CO detectors shall be adjustable to activate upon detection of 25PPM, 35PPM (standard), 50 PPM, or 100PPM Carbon Monoxide within the space. Each detector shall cover approx 4,000 square feet of floor space.
3. System shall be ETL or UL listed and shall be able to be calibrated and adjusted in the field.
4. A problem with the detector and or fan shall be relayed to a local alarm to notify user of a problem/failure with the CO detection system.
5. Acceptable Manufacturers: Subject to compliance with requirements, provide products by one of the following or an approved equal as submitted to and accepted by the CDB Representative.:
  - 1) Macurco
  - 2) Honeywell
  - 3) Johnson Controls

### I. MOTORIZED DAMPERS

1. Maximum blade length to be 80".
2. Each damper to be controlled by an individual actuator in sections not to exceed 80" wide x 50" high or as recommended by manufacturer.
3. Damper frames shall be not less than 14 gauge galvanized steel formed for extra strength with mounting holes for flange and enclosed duct mounting.
4. Temperature control contractor shall furnish and install all linkage and damper motors.

5. Automatic volume control dampers for room control, where indicated on drawings, shall be provided with stops to allow dampers to operate between 10% and 100% open positions.
6. No damper blade shall be greater than 8" in width and shall be fabricated of 14 gauge galvanized steel; bearings shall be nylon with 1/2" zinc plated steel shafts and shall be readily accessible.
7. The leakage through outdoor air intake dampers and exhaust dampers shall be not more than 1% at 1500 fpm approach velocity at 4" static closing torque.
8. All automatic dampers equipped with electronic end switches shall operate from control rod of motor operator, not a damper blade.
  - a. Linkage to blades will not be allowed

## 2.5 FRESH AIR AND EXHAUST LOUVERS

- A. Fixed exterior fresh air and exhaust louvers and bird screens will be provided under Division 08 90 00 Louvers and Vents of the specifications but work included under this section shall include the final connections to fresh air intakes and exhaust louvers.

## 2.6 LUBRICATION AND START-UP

- A. Prior to operation, all equipment shall be properly lubricated in accordance with the manufacturer's instructions. After proper lubrication, all units shall be started by the Contractor, in the presence of the Architect or his representative and the following data recorded:
  1. Equipment serial number.
  2. Drive information.
  3. Motor serial number, HP and other data.
  4. Motor ampere and voltage readings on all phases.
  5. Four (4) certified copies of data shall be delivered to CDB's representative.

## 3. EXECUTION

### 3.1 TESTING, ADJUSTING AND BALANCING PROCEDURES

- A. In order to meet the required tolerance of the plans and specifications, general testing, adjusting and balancing procedures shall be in accordance with procedures as outlined in applicable standards.
  1. Submit air balance, noise and vibration testing procedures to the Architect for approval prior to performing TAB work.
- C. Patch holes in insulation, ductwork and housing, which have been cut or drilled for test purposes, in manner recommended by original installer.
- G. Mark equipment settings, including damper control positions, fan speed control levers, and similar controls and devices, to show final settings at completion of TAB work. Provide markings with paint or other suitable permanent identification materials.
- H. Determine if HVAC equipment is operating with satisfactory vibration levels to assure

that objectionable vibration and the resultant noise are not transmitted to the building structure.

1. Test the isolation system per the procedures as indicated in Chapter 47 of the 2003 APPLICATIONS MANUAL - ASHRAE.
2. No amplitude measurements at driving and driven speeds shall exceed values as specified in Table 25 on Page 35.19 of the preceding referenced standard.

### 3.2 INTERFERENCE WITH OCCUPANCY

- A. No service or system shall be interrupted, even momentarily, without CDB's permission and only at such time as designated by him.

### 3.3 CARE AND PROTECTION

- A. Exposed surfaces of all material and equipment provided herein shall be protected against oxidation and rusting.
- B. Touch-up all damaged prefinished surfaces as required or as directed by the CDB Representative before acceptance by CDB and the Using Agency.
- C. All material and equipment shall be left in a clean, presentable condition to the satisfaction of the CDB Representative and Using Agency.
- D. All equipment shall be clean from dust and debris before acceptance by CDB and the Using Agency. All contacts in the above equipment and control equipment shall be free from dust deposits.

### 3.4 CORING, CUTTING AND PATCHING

- A. Provide all necessary coring or cutting in walls, floors, and ceilings related to ventilation work.
- B. All work shall be neatly and carefully executed and repaired in an approved and workmanlike manner.
- C. No cutting into the structural work of the building shall be done without the approval of the Architect.

### 3.5 STRUCTURAL DIFFICULTIES

- A. Should any structural difficulties prevent installation of ventilation work at points indicated on drawings, minor deviations therefrom, as approved by the Architect, may be permitted and shall be made without additional cost.

### 3.6 WARRANTY

- A. Provide one year contractor warranty on material and labor for all related work.

### 3.7 CLEANING UP

- A. Clean-up all debris as it accumulates, and leave premises in a clean and orderly fashion each day.

### 3.8 INSTALLATION OF EQUIPMENT AND COMPONENTS

- A. Install equipment and components in accordance with manufacturer's published installation instructions, with recommended locations to ensure that the specified products serve the intended function. Provide recommended clearances for service, maintenance and inspection.

END 23 05 00

1. GENERAL

1.1 WORK INCLUDES

- A. Base Bid: Contractor shall design and provide a complete electrical power and lighting system including extending service from the existing MDP in the Maintenance Building as shown on the drawings and as specified herein.
- B. Alternate Bid G-1: Provide one additional 20A block heater receptacle at 15 feet on center on the West exterior wall.
- C. Alternate Bid G-2: Provide two additional 20 Amp block heater receptacles at 15 feet on center and one additional wall pack equally spaced as specified on drawings at the exterior West wall. Move interior lighting layout 30 feet South of layout shown on the drawings and insert two additional lights on the North end switched from wall switch S2.

1.2 QUALITY ASSURANCE

- A. Contractor Responsibilities:
  - 1. Responsibilities include designing, fabricating, and installing lighting and power systems including, but not limited to drawing preparation, for submittal to the CDB Bridging Document A/E for review and compliance with project requirements.

1.3 RELATED WORK

- A. 23 05 00 Ventilation Work
- B. 31 23 00 Excavating Backfilling & Compacting
- C. 32 01 00 Surface Restorations

1.4 REGULATORY REQUIREMENTS

- A. Nationally recognized testing laboratory.
- B. National Fire Protection Association, NFPA.
  - 1. NFPA 101: Life Safety Code - 2006.
- C. Illinois State Fire Marshal Regulations/Local Fire Department.
  - 1. Comply with governing regulations for emergency lighting and exit sign systems.
- D. International Building Code (IBC) - 2015.
- E. International Energy Conservation Code (IECC) - 2015.
- F. ASHRAE 90.1 - 2013
- G. National Electrical Code (NEC) - 2017.

## 1.5 SUBMITTAL

- A. Product Data:
  - 1. Submit manufacturer's data for:
    - a. Wire and cable.
    - b. Conduit and outlet boxes.
    - c. Switches and receptacles.
    - d. Disconnect switches.
    - e. Lighting fixtures.
    - f. Distribution and lighting panel
    - g. Time Clock
- B. At completion of work, provide record documents in compliance with CDB Requirements.

## 2. PRODUCTS

### 2.1 WIRE AND CABLE (600 VOLTS OR LESS)

- A. All wire and cable used in this installation shall be copper conductor and shall have 600 volt insulation unless otherwise noted. All direct burial wiring shall be RHW.
- B. Unless otherwise noted, conductors for lighting and power circuits shall be #12 AWG minimum size.
- C. Conductors for control circuits shall be #14 AWG, minimum size.
- D. Insulation types shall be as follows:
  - 1. Type THHN/THWN - #14 to #3 AWG.
  - 2. Type XHHW - #2 AWG and larger.
  - 3. Type RHW - #12 AWG and larger for outdoors.
- E. All A.C. branch circuit wiring shall be done with color-coded conductors throughout the installation, as follows:

#### 120/240 V System

"A" Phase	Black
"B" Phase	Red
"C" Phase	Blue
Neutral	White
Equipment Ground	Green

### 2.2 WIRE CONNECTIONS

- A. All branch circuit wire and cable splices in conductors up to and including No. 10 AWG shall be as follows:
  - 1. Connectors: Solderless, screw-on, reusable pressure cable type, 600 volt, 105° Celsius with integral insulation, approved for copper and aluminum conductors.
  - 2. The integral insulator shall have a skirt to completely cover the stripped wires.

3. The number, size, and combination of conductors, as listed on the manufacturers' packaging shall be strictly complied with.
- B. All wire and cable connections or splices in conductors of Size 8 AWG and larger shall be made with O.Z./Gedney Co., Burndy, or T&B solderless connectors.
- C. "Six inch" loops or ends shall be left at each outlet for connection to fixtures or devices.
- D. All wire and cable splices shall be neatly and carefully made, exercising extreme skill to insure neat workmanship and proper insulation over the splice.

## 2.3 CONDUIT

- A. Conduit:
  1. Unless otherwise noted, all conduit used in this installation shall be rigid heavy wall PVC and shall meet in all respects, a nationally recognized laboratory's standard for conduit.
  2. Minimum Trade Size: 3/4 inch unless otherwise noted.
  3. Conduit for electric feeders shall have an insulated equipment ground conductor installed throughout its entire length.
- B. Flexible Metallic Conduit (Liquidtight):
  1. Flexible metal conduit (liquidtight) shall be flexible steel with PVC jacket. Fittings shall be of steel or malleable materials with steel compression rings.
  2. Acceptable locations for flexible metallic conduit (liquidtight) shall be motor connections and damp or wet locations.

## 2.4 OUTLET BOXES

- A. Boxes shall be fiber glass, single piece, with suitable finish ring where flush mounted.
- B. Provide solid gang boxes for multiple gang devices.
- C. Weatherproof boxes shall be cast type with suitable gasketed cover.

## 2.5 SWITCHES AND RECEPTACLES

- A. Toggle switches and convenience receptacles shall be specification grade heavy duty type.
- B. Color of devices shall be ivory.
- C. Duplex receptacles shall be rated 20 amps, 125 volts, NEMA 5-20R.
- D. Duplex receptacles with ground fault circuit interrupter (GFI) shall be rated 20 amperes, 125 volts, NEMA 5-20R.



- E. All toggle switches shall be rated 20 amps, 120/277 volts.
- F. All devices shall be full gang type construction; interchangeable type are not acceptable.
- G. Devices shall be manufactured by: Subject to compliance with requirements, provide products by one of the following or an approved equal as submitted to and accepted by the CDB Representative.:

	<u>Switches</u>	<u>Receptacles</u>
1. Harvey Hubbell, Inc.	#1221-1	5262-1
2. Pass & Seymour	#20AC1-1	6200-1
3. General Electric	#5951-2G	5262-2

- H. Device plates shall be smooth "nylon" thermoplastic colored ivory.
- I. Provide thermal overload switches on all single phase motors. Subject to compliance with requirements, provide products by one of the following or an approved equal as submitted to and accepted by the CDB Representative.:

1. Allen Bradley	Bulletin No. 600
2. Square "D"	Class 2510
3. ITE	Type MSF11

## 2.6 DISCONNECT SWITCHES

- A. Disconnect switches shall be heavy-duty type, stainless steel, rated 600 volts, fused or non-fused type as indicated on the Drawings:
  - 1. Indoor Enclosure – NEMA 1, stainless steel
  - 2. Outdoor Enclosure – NEMA 3R.
- B. Disconnect switches shall be as manufactured by: Subject to compliance with requirements, provide products by one of the following or an approved equal as submitted to and accepted by the CDB Representative.:

- 1. General Electric.
- 2. Square D, (IL).
- 3. Cutler-Hammer.

## 2.7 SUPPORTING DEVICES

- A. Surface Mounted Cabinets: Secure cabinets directly to wall using suitable wall anchors, or provide a suitable frame for mounting and supporting the cabinets using "Unistrut" type supports as required.
- B. All supporting devices shall be stainless steel.
- C. Hanger Rods:

1. Provide rods of proper length for all electrical items necessitating same.
  2. Minimum rod diameter shall be 3/8".
  3. Provide after-set inserts as required.
  4. All hanger rods shall be stainless steel.
- D. Cable Supports: All riser cables shall be supported by means of O.Z./Gedney Co. cable supports at each panel and pull box in accord with Code requirements.
- E. Conduit Supports and Hangers:
1. All individually suspended conduits shall be supported with stainless steel pipe clamps, from threaded stainless steel rods.
  2. The stainless steel rods shall be affixed to the building structure by means of inserts in concrete slab or beam clamps affixed to the steel structure.
  3. Where multiple conduits are installed adjacent to each other, a trapeze hanger consisting of stainless steel Unistrut suspended from at least two threaded stainless steel rods, shall be used. The conduits shall be affixed to the Unistrut with stainless steel split pipe clamps.
  4. All hangers and clamps shall be as manufactured by Unistrut, Power Strut or equal, as approved.

## 2.8 LIGHTING FIXTURES

- A. Provide lighting fixtures in accord with the schedule shown on the drawings.
1. Interior General Illumination – Pendant Mount, 24" Linear Highbay fixture with LED lamp equivalent to 400 watt metal halide. Tag: F1
  2. Exterior Security Lighting – Surface Mounted Traditional style wall pack with LED lamp equivalent to 175 watt metal halide. Tag F2
  3. Interior Combination Emergency/Exit – Wall Mounted – LED with battery backup. Tag F3
- B. Fixtures shall be provided complete with lamps, ballasts, hanger and support fittings, finish trim and required connections.
- C. Fixtures shall be suitable for a highly corrosive environment.
- D. Acceptable Manufacturers: Subject to the design specifications set forth herein. Provide same manufacturer for all fixtures of the same type. (Tag). Select suitable products from the following or an approved equal as submitted to and accepted by the CDB Representative.:
- |   |                    |
|---|--------------------|
| 1. Acculite                               | 2. Cooper Lighting |
| 3. Juno Lightin                           | 4. Light Alarms    |
| 5. Lithonia Lighting Corp.                | 6. LSI             |
| 7. Lumerica                               | 8. LumeGen         |
| 9. MaxLite                                |                    |
| 10. Bridging Documents A/E Approved Equal |                    |

## 2.9 DISTRIBUTION AND LIGHTING PANEL

- A. Provide, ready for operation, the service rated lighting and receptacle panel as herein specified and as shown on the drawings. Panels shall be suitable for 120/240 volts, 3 phase, 4 wire, 60 Hertz system and include one 20amp duplex mechanics receptacle surface mounted adjacent to the panel.
  
- B The panels, together with their cabinets, subject to compliance with requirements, provide products by one of the following or an approved equal as submitted to and accepted by the CDB Representative.:
  - 1. General Electric Co.
  - 2. Square "D" Company.
  - 3. Eaton
  
- C. The lighting distribution panels shall have short circuit interrupting rating as shown on drawings.
  - 1. Panel with a main circuit breaker mounted in the cabinet shall have fully-rated main and branch circuit devices.
  - 2. The panel bus bars shall be braced to withstand the maximum fault current that is available at the main terminals of the panelboard.
  
- D. Each branch circuit protective device shall have a numbering strip showing the circuit number, mounted adjacent to same for identification. Numbers shall be arranged 1-3-5 (A-B-C phase).
  
- E. The lighting distribution panels shall have main circuit breakers.
  
- F. The branch circuit breakers shall be bolt-on type.
  
- G. All interconnections on the panels shall be made with copper bus bars, of such cross-section that the maximum current density shall not exceed 1000 amperes per square inch. The bus bar interconnections shall be arranged with main terminal lugs at the top or bottom, all covered with blank section of the same composition as the breaker sections.
  
- H. The distribution panels' buses shall be arranged for connection to three phase, four wire feeders with the single phase branch circuits equally divided among the three phases.
  
- I. Each panel shall be mounted in its cabinet on adjusting nuts to allow the panel to be leveled and aligned in the cabinet.
  
- J. The main and branch circuit protective devices shall be as manufactured by the same manufacturer providing the panel.
  
- K. The panel cabinets shall be constructed in accord with article "Distribution Panel Cabinets" of this specification.

## 2.10 DISTRIBUTION PANEL CABINETS

- A. All lighting and power panels shall be enclosed in a code gauge sheet stainless steel cabinet having doors and trim of a type to conform to the cabinet mounting.
- B. Cabinet Fixed Trim Plates:
  - 1. Flush Mounted Cabinets:
    - a. Trim plate shall be equipped with guide pins.
  - 2. Surface Mounted Cabinets:
    - a. The fixed trim plate shall be hung on the cabinet tub with a heavy-duty continuous piano type hinge.
    - b. Manufacturer's standard mounting.
- C. Cabinet Doors:
  - 1. All cabinet doors shall be an integral part of the fixed trim plate, and shall be hung thereon with a heavy duty continuous piano type hinge.
- D. Cabinet Door Catches:
  - 1. All cabinet doors shall be locked and keyed alike.
  - 2. All cabinet doors less than 30" high shall have one Corbin lever type catch #15767 with key to match existing.
  - 3. Cabinet doors 30" to 48" in height shall be equipped with two Corbin catches with keys.
  - 4. All cabinet doors which are over 48" high shall be equipped with standard vault handles having three point catches.
  - 5. Manufacturer's standard door catches.
- E. Cabinet Wiring Gutters:
  - 1. All cabinets shall be of sufficient size to allow ample wiring gutters on the top, bottom and both sides and not at the rear.
  - 2. Wiring gutters shall be sized equal to or larger than size required by code.
- F. Cabinet Equipment Ground Bus:
  - 1. The cabinets shall have an equipment ground copper bus bar bonded to the enclosure.
  - 2. The size of ground bus to equal ampacity of equipment ground conductor connected to cabinet.
  - 3. The equipment ground bus shall be properly marked.
- G. Cabinet Mounting Height:
  - 1. Cabinet shall be installed with the top approximately 6" below top of enclosure.
- H. Cabinet Finish:
  - 1. Cabinets shall be degreased and prime coated inside and outside.
  - 2. Cabinets shall be sprayed in the shop with two (2) coats of aluminum Lacquer for final finish.

3. Touch-up as required after installation.

G. Cabinet Directory:

1. Provide typewritten directories of circuits for each panel. Directory shall be mounted in back of a durable transparent plastic cover set in a suitable frame fastened on the inside of the panel door.
2. Final payment will not be made on the contract until all circuit directories are in place.

## 2.11 TIMER

A. Electronic Time Switches: Electronic seven-day timer with independently programmable SPDT contacts rated for a 20 amp ballast, inductive, tungsten or combination load at a voltage coordinated with the load controlled. The lighting control shall allow multiple input voltages of 120/240. Lighting control shall be listed by a nationally recognized testing laboratory and shall meet all requirements of the International Energy Conservation Code. Enclosure shall be NEMA 3R. Features shall include the following:

1. 24-hour time-of-day programming.
2. Automatic daylight savings adjustment.
3. Holiday and weekend programming (365 days)
4. Astronomic capability (dusk on/dawn off)
5. A minimum of 5 ON and 5 OFF setpoints.
6. Time indicated on AM/PM format.
7. Manual override to ON and OFF positions.
8. Manual skip to next scheduled event.
9. Battery backup to maintain time and program memory for a minimum of 7 days.
10. Transient protection for up to 6,000 volts.
11. Functions over temperature range of -40°F to 122°F.

B. Timer manufacturer shall be subject to compliance with requirements, provide products by one of the following or an approved equal as submitted to and accepted by the CDB Representative.:

:

1. Intermatic, Inc.
2. Paragon Electrical Products
3. Tork

## 2.12 PHOTOCCELL

A. Description: Solid state, with SPST dry contacts rated for 1800-VA tungsten or 1000-VA inductive, to operate connected relay, contactor coils, or microprocessor input; complying with nationally recognized testing laboratory.

1. Light-Level Monitoring Range: 1.5 to 10 fc, with an adjustment for turn-on and turn-off levels within that range, and a directional lens in front of photocell to prevent fixed light sources from causing turn-

- off.
- 2. Time Delay: 15-second minimum, to prevent false operation.
- 3. Surge Protection: Metal-oxide varistor, complying with IEEE C62.41.1, IEEE C62.41.2, and IEEE 62.45 for Category A1 locations.
- 4. Mounting: Provide stem-and-swivel mounting accessories as required to direct sensor to the north sky exposure.

B. Photocell shall manufacturer shall be same as timer.

### 2.13 LIGHTING CONTACTOR

A. Description: Electrically operated, multiple pole and mechanically held, combination type with fusible switch, complying with NEMA ICS 2 and nationally recognized testing laboratory.

- 1. Current Rating for Switching: Listing or rating consistent with type of load served, including tungsten filament, inductive, and high-inrush ballast (ballast with 15 percent or less total harmonic distortion of normal load current).
- 2. Fault Current Withstand Rating: 18KA.
- 3. Enclosure: Comply with NEMA 4, stainless steel
- 4. Provide with control and pilot devices as indicated on Drawings, matching the NEMA type specified for the enclosure.

B. Lighting Contactor shall be subject to compliance with requirements, provide products by one of the following or an approved equal as submitted to and accepted by the CDB Representative.:

- 1. Allen-Bradley/Rockwell Automation.
- 2. ASCO Power Technologies, LP; a division of Emerson Electric Co.
- 3. Eaton Electrical, Inc.; Cutler-Hammer Products.
- 4. GE Industrial Systems; Total Lighting Control.
- 5. Square D; Schneider Electric.

## 3. EXECUTION

### 3.1 INCOMING ELECTRICAL SERVICE

A. Incoming service shall remain as is.

### 3.2 GROUNDING

A. Provide all labor and material necessary for properly grounding the electrical wiring system, including new panelboard, as required by National Electrical Code.

B. All feeder conduits shall be equipped with grounding type bushings.

### 3.3 INTERFERENCE WITH OCCUPANCY

- A. The existing building is presently occupied and will continue to be during the course of construction. It is imperative, therefore, that the work covered by this specification be executed with a minimum of inconvenience to the building personnel.
- B. No service or system shall be interrupted, even momentarily, without the Owner's permission and only at such time as designated by him.

### 3.4 CARE AND PROTECTION

- A. Exposed surfaces of all material and equipment provided herein shall be protected against oxidation and rusting.
- B. Touch-up all damaged prefinished surfaces as required or as directed by the Architect before acceptance by the Owner.
- C. All material and equipment shall be left in a clean, presentable condition to the satisfaction of the Architect and Owner.
- D. All panels and cabinets, starters, motors, lighting fixtures, etc., shall be clean from dust, plaster or other debris before acceptance by the Owner. All contacts in the above equipment and control equipment shall be free from dust deposits.

### 3.5 PHASE SEQUENCE, ROTATION AND IDENTIFICATION

- A. All lighting receptacles and motor branch circuits shall be completely phased out for sequence and motor rotation. Phase identification shall be permanently identified using color coded conductors.
- B. Phase sequence shall be A-B-C (viewed from front):
  - 1. Left to right.
  - 2. Top to bottom.
  - 3. Front to rear.

### 3.6 SLEEVES AND OPENINGS

- A. Provide all openings and sleeves in walls and floor as required for this work.
- B. Sleeves shall be stainless steel conduit or fiberglass conduit, as noted. Aluminum conduit shall not be used.
- C. Unless specific sizes are indicated on the drawings, sleeves shall be sized to provide one-half (1/2) inch clearance around outside surface of the item for which they are installed.
- D. Annular space between sleeve and surface of item protruding shall be suitably provided with fire stop material as hereinafter specified.
- E. Sleeves shall be cut flush with wall surfaces, and shall extend 1-1/2 inches

above finished floors unless otherwise indicated.

### 3.7 CORING, CUTTING AND PATCHING

- A. Provide all necessary coring or cutting in walls, floors, and ceilings related to electrical work.
- B. All work shall be neatly and carefully executed and repaired in an approved and workmanlike manner.
- C. No cutting into the structural work of the building shall be done without the approval of the Architect.
- D. See Special Conditions for specific coring instructions and procedures.

### 3.8 REMOVAL OF SCRAP MATERIAL

- A. All electrical materials removed, unless otherwise designated by the Owner or Architect, shall become the property of the General Contractor and shall be removed from the premises by him.

### 3.9 STRUCTURAL DIFFICULTIES

- A. Should any structural difficulties prevent installation of electrical work at points indicated on drawings, minor deviations therefrom, as approved by the Architect, may be permitted and shall be made without additional cost.

### 3.10 LOCATION OF OUTLETS

- A. The location of outlets shown on the plans is approximate. The exact location shall be coordinated on the job site.
- B. The heights of the various outlet boxes installed in walls or other vertical surfaces shall be as indicated on the architectural drawings.

END 26 05 00



**DIVISION 31 – EARTHWORK**

**Section 31 23 00 – Excavating, Backfilling & Compacting**

1. GENERAL

1.1 WORK INCLUDES

A. BASE BID

1. Contractor provide:

- a. Sawcut and remove existing asphalt pavement as required to facilitate construction as indicated on the drawings.
- b. Excavate as required for new structure, utilities and grade alterations. Haul all spoils off-site as to approved disposal sites for clean and contaminated spoils.
  1. Contractor shall exercise great care with excavations near foundation of Spreader rack steel framing. Do not undermine this structure.
- c. Implement IDOT specified procedures for excavation, storage, protection, recording and disposal of contaminated soils and related material per Section 02 61 13
- c. Place and compact aggregate backfill and bed under structures.
- d. Excavate as required, (including directional boring) as noted on plans to extend electrical service from source to new building.
- e. Compact fill over utilities as required.
- f. Compaction testing of subgrade and backfill materials.
- g. Protection of new and existing drainage structures
- h. Cleanup and Restoration

B ALTERNATE BID G1

1. Contractor provide all work as specified herein to extend the building 15'-0" to an overall length of +/- 215'-0"

C. ALTERNATE BID G2

1. Contractor provide all work as specified herein to extend the building 30'-0" to an overall length of +/- 230'-0"

1.2 RELATED WORK

A. Specified Elsewhere:

**DIVISION 31 – EARTHWORK**

**Section 31 23 00 – Excavating, Backfilling & Compacting**

- 1. 02 31 32 Geotechnical Data
- 2. 02 61 13 Excavation & Handling of Contaminated Materials
- 3. 26 05 00 Electrical Work
- 4. 32 01 00 Surface Restoration
- 5. 32 12 16 Asphalt Paving
- 6. 32 75 10 Cement Concrete Pavement
- 7. 33 41 00 Storm Drainage Piping

1.3 REFERENCES

- A. IDOT Standard Specifications for Road and Bridge Construction, April 1, 2016 and IDOT Supplemental Specifications and Recurring Special Provisions adopted January 1, 2018 except:
  - 1. Methods of Measurement and Basis of payments do not apply.
  - 2. References to “Engineer” shall mean “Architect/Engineer.”

1.4 FIELD QUALITY CONTROL

- A. General Contractor shall allow the testing representative to inspect and test each subgrade and each fill or backfill layer. Do not proceed until test results for previously completed work has been verified to be in compliance with the project requirements.

1.5 PROTECTION

- A. Protect excavations by shoring, bracing, sheet piling, underpinning or other methods to prevent cave-in or loose soil from falling into the excavation.
- B. Underpin adjacent structures that may be damaged by excessive excavation work, including utilities and pipe chases and removal of unsuitable soil for bearing.
- C. Notify A/E immediately of unexpected subsurface conditions. Confirm notification in writing. Discontinue work until A/E issues written notification to resume work.
- D. Provide equipment necessary to maintain excavation in a relatively dry state including sump pit, pumps, piping, etc... to properly dewater the site from groundwater seepage, snow and or rainfall.
  - 1. Excavations for foundations shall be protected by all reasonable means necessary to avoid damage or saturation by exposure to inclement weather
- E. Protect bottom of excavations and soil adjacent to and beneath foundations from frost.

## DIVISION 31 – EARTHWORK

### **Section 31 23 00 – Excavating, Backfilling & Compacting**

- F. Grade top perimeter of excavations to prevent surface water runoff from getting into the excavation.
- G. Protect new and existing drainage structures from accepting sediment, aggregates, and other deleterious construction materials until Substantial Completion. Follow IDOT Standards.

#### 1.6 SUBMITTALS

- A. Verification of compliance from aggregate supplier that each aggregate furnished to the site is IDOT grade certified compliant.

#### 2. PRODUCTS

##### 2.1 POROUS GRANULAR BACKFILL: Comply with IDOT specification Section 1003, Fine Aggregate and Section 1004, Coarse Aggregate.

- A. For base under finished interior concrete slabs, CA-6 minimum or finer.
- B. For base under asphalt paved areas, CA-6.

##### 2.2 COMMON FILL MATERIALS: Subsoil; May reuse excavated topsoil and subsoil that is free of gravel larger than 2” and free of deleterious debris.

#### 3. EXECUTION

##### 3.1 INSPECTION

- A. Verify stockpiled fill to be used has been accepted by A/E.
- B. Verify and confirm in writing that the areas to be backfilled are free of debris, snow, ice or water and surfaces are not frozen

##### 3.2 PREPARATION

- A. Compact subgrade surfaces to the density specified for backfill materials.

##### 3.3 EXCAVATION

- A. Cut excavations wide enough to enable utility connections and to allow inspection.
- B. Hand trim excavation and leave free of loose matter.
- C. Removed lumped subsoil, boulders and rock up to 1/3 cubic yard in size.
- D. Excavation shall not interfere with normal 45 degree bearing distribution of existing foundations.
- E. Do not undermine adjacent foundation and footings. Excavate to the depth required to install new footings as indicated on plans or to match the existing building footing.

**Section 31 23 00 – Excavating, Backfilling & Compacting**

- F. Promptly correct any unauthorized excavation.
- G. Excavated materials required for backfilling may be temporarily stored on site until needed. Contractor shall coordinate with the Using Agency for location of deposition of all excess excavated materials.
  - 1. Contractor shall separate topsoil, subsoil and aggregate laden excavated materials into specific piles.
  - 2. Contractor shall promptly haul all excessive excavated materials off-site.
  - 3. On-site deposition of excavated material shall be placed in such a manner as to not interrupt natural site drainage or impede operations of the Using Agency.

**3.4 BACKFILLING**

- A. Support pipe and conduit during placement and compaction of bedding fill.
- B. Backfill excavations to meet existing building grade and contours. Backfill systematically and as early as possible to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.
- C. Place and compact select fill materials including aggregate fill in continuous layer not exceeding eight inches (8”) in loose depth.
- D. Place and compact common fill materials in continuous layers not exceeding twelve inches (12”) in loose depth.
- E. Use a placement method that will not disturb or damage direct buried electric service cables, utilities in trenches or adjacent structures.

**3.5 COMPACTION**

Contractor shall perform compaction testing of subgrade and all backfill materials. Do not proceed with subsequent work until testing has been completed and satisfactory results have been presented to the A/E for concurrence.

- A. Subgrade under structures shall have a minimum bearing capacity as indicated on the drawings.
  - 1. Do not proceed with foundation construction until subgrade has been verified and accepted by the A/E.
  - 2. Verify bearing capacity with A/E upon reaching finished grade.
- B. Place backfill and fill materials in layers not more than twelve inches (12”) in loose depth for material compacted by heavy compaction

**DIVISION 31 – EARTHWORK**

**Section 31 23 00 – Excavating, Backfilling & Compacting**

equipment and not more than four inches (4”) of loose depth for material compacted by hand-operated tampers.

- C. Place backfill and fill materials evenly and uniformly on all sides of structures to the required elevations. No heavy equipment shall be permitted within 6, (six) feet of any concrete structural wall.
- D. Percentage of Maximum Dry Density Requirements: Compact soil and aggregate fill to not less than the following percentages in accord with ASTM D1557 (Modified Proctor):
  - 1. Under structures and pavements compact subgrade and each layer of backfill or fill material at 95% maximum dry density.
  - 2. Under walkways, compact subgrade and each layer of backfill or fill material at 95% maximum dry density.
  - 3. Under lawn or unpaved areas, compact the top six inches (6”) below subgrade and each layer of backfill or fill material at 90% maximum dry density.

END 31 23 00

1. GENERAL

1.1 WORK INCLUDES

A. BASE BID

1. Contractor provide:
  - a. Backfill asphalt paved areas disturbed by construction operations with aggregate and compact to not less than 4” of the surrounding pavement.
  - b. Patch all disturbed areas adjacent to asphalt surfaces with a minimum of 4” of asphalt. Place, pitch and rolled to match existing grade and to form a smooth transition to existing asphalt pavement.
  - c. Perform cut and fill operations as necessary to establish final grades as indicated on plans. Provide for compacted aggregate base and asphalt surface where specified.
  - d. Restore existing landscape areas disturbed by construction operations with topsoil graded to meet existing contours and seed as specified herein.

1.2 RELATED REQUIREMENTS

- A. 31 23 00 Excavating, Backfilling & Compacting
- B. 32 12 16 Asphalt Paving

1.3 REGULATORY REQUIREMENTS

- A. IDOT Standard Specifications for Road and Bridge Construction, April 1, 2016 except:
  1. Methods of Measurement and Basis of payments do not apply.
  2. References to “Engineer” shall mean “Architect/Engineer.”

1.4 PROTECTION

- A. Protect landscaping and other features remaining.
- B. Protect adjacent fences, roads, sidewalks paving and curbs.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver grass seed in original containers showing analysis of seed mixture, percentage of seed, year of production, net weight, date and location of packaging. Damaged packaging or non-labeled packaging is not acceptable. Provide Architect with content label for record.
- B. Deliver fertilizer in waterproof bags showing weight, chemical analysis and manufacturer’s name. Provide Architect with content label for record.
- C. Store all products off the ground, in a dry location out of the way of construction operations. Protect to prevent damage until installed.

2 PRODUCTS

2.1 MATERIALS:

- A. Aggregate: Crushed limestone meeting IDOT Specifications for CA-6 gradation.
  - 1. At Contractor’s option, crushed concrete in compliance with Article 1004 of the IDOT Standard Specification screened for CA6 gradation that also meets all provisions of Policy Memorandum 7-08-1 dated June 1, 2012 is acceptable.
- B. Asphalt: See Reference Specification. Hot-Mix asphalt only. Cold patch material is prohibited.
- C. Turf: Reuse excavated topsoil where possible.
  - 1. Topsoil shall not be in a frozen or muddy condition and shall be free from subsoil, slag, clay, stones, lumps, live plants, roots, sticks, crabgrass, coughgrass, noxious weeds and foreign matter including construction debris.
  - 2. If additional topsoil is required to complete the contract to the grades and minimum thickness specified herein, the Contractor shall obtain additional topsoil that meets the requirements of IDOT Standard Specification Article 1081.05.
- D. Seed: Comply with IDOT Specification Article 1081.4
  - 1. Seed Mixture: 45% Kentucky Blue Grass, 50% Creeping Red Fescue and 5% Norlea Perennial Rye.
- E. Fertilizer: Comply with IDOT Specification 1081.08. 8-32-16 mix.
- F. Erosion Control Blanket:
  - 1. Natural fiber blanket capable of degrading within +/- 1 year
  - 2. Complies with IDOT Specification 1081.10

3. EXECUTION

3.1 INSPECTION

- A. Inspect site conditions and notify A/E in writing of all conditions that would impair proper execution of the work.
- B. Beginning work constitutes acceptance of existing conditions.

3.2 PREPARATION

- A. Remove all foreign materials from site. Do not bury foreign material.
- B. Trim and dress edges of existing pavement so that they are clean and free of cracked or otherwise damaged material that could break free during aggregate base and pavement restoration operations.

- C. Cultivate areas to receive topsoil to a depth of 3". Repair cultivation in areas where equipment has compacted subgrade.
- 3.3 Placing Aggregate Base:
- A. At all asphalt pavement areas to be restored, place aggregate in not more than four inch (4") evenly distributed lifts and compact each lift as specified in Section 312300.
  - B. Depth of aggregate base restoration shall be a minimum of eight inches (8") when fully compacted to specification and shall be level to within 3" of adjacent asphalt paved areas. Tolerance of +/- 1/2".
- 3.4 Spreading Topsoil:
- A. Spread topsoil to a minimum depth of four inches (4") over areas to be seeded. Place during dry weather and on dry, non-frozen subgrade.
  - B. Cultivate topsoil to a depth of four inches (4") with a mechanical tiller. Remove all foreign materials collected during cultivation from site and rake until smooth.
  - C. Grade to eliminate rough spots and low areas where ponding may occur. Maintain smooth uniform grade that meets existing contours.
  - D. Finish ground level firm and sufficient to prevent sinkage pockets when irrigation is applied.
- 3.5 Fertilizer Application:
- A. Apply per IDOT Specification Article 250.04 at a rate of ten (10) pounds actual nutrients per 1,000 s.f.
  - B. Do not apply grass seed and fertilizer at the same time in the same machine.
  - C. Lightly water to aid breakdown of fertilizer and to provide moist soil for seed.
- 3.6 SEEDING
- A. Do not sow immediately following rain, when ground is too dry or during windy periods.
  - B. Apply seed at a rate of six (6) pounds per 1,000 s.f. Seed in turf areas shall be sown with a machine that mechanically places the seed in direct contact with the soil, packs and covers the seed in one continuous operation per IDOT Specification Article 250.06.
  - C. Broadcasting or hydraulic seeding will be allowed as approved by the A/E in accessible areas where use of the equipment specified is physically impossible.
  - E. Roll seeded area with roller not exceeding 112 pounds.
  - F. Apply water with fine spray immediately after each area has been sown.
- 3.7 EROSION CONTROL BLANKET
- A. Install blankets on all sloped areas in accordance with IDOT Specifications.
  - B. Place within 24 hours after seeding operations have been completed.
  - C. Lay blankets smooth without stretching, butting ends snugly.



3.8 MAINTENANCE AND PROTECTION

- A. Maintenance shall include watering, as well as, temporary protective fences, barriers and signs where deemed necessary until substantial completion of the project.
- B. Water to insure uniform seed germination and to keep surface of soil damp.
- C. Apply water slowly so that surface of soil will not puddle and crust.
- D. Replant damaged areas showing root growth failure, deterioration, bare or thin spots and eroded areas.

END 32 01 00

1. GENERAL

1.1 WORK INCLUDES

A. BASE BID

1. Contractor provide hot-mix asphalt paving and patching including all base and sub-base preparation as indicated on the drawings and as specified herein including;
  - a. Building Flooring Surface
  - b. Patching of disturbed areas due to construction including re-worked drainage areas and new concrete containment pad at south overhead door.
  - c. Patching at new storm pipe trench.

1.2 RELATED WORK

A. Specified elsewhere:

1. 31 23 00 Excavating, Backfilling & Compacting
2. 32 01 00 Surface Restoration, Grading & Seeding
3. 33 41 00 Storm Drainage Piping

1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm experienced in manufacturing hot-mix asphalt similar to that indicated for this Project and with a record of successful in-service performance.
- B. Hot-Mix Plant: Registered with and approved by IDOT
- C. Testing and Inspection Requirements:
  1. Testing shall be performed by IDOT personnel. Inspection shall be performed by the Architect. Contractor shall notify the Architect not less than 48 hours in advance of all work requiring testing or inspection. Architect will notify responsible party at IDOT for testing.
  2. Asphalt paving shall be tested for gradation, asphalt content and in-place depth and density.

1.4 REGULATORY REQUIREMENTS

- A. Comply with applicable sections of the IDOT Standard Specifications for Road and Bridge Construction, April 1, 2016 edition and especially:
  1. Division 300 – Subgrades, Subbases and Base Courses
  2. Division 400 – Surface Courses, Pavements, Rehabilitation and Shoulders

1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp or if the following conditions are not met:
  - 1. Tack Coat: Minimum surface temperature of 60 deg. F.
  - 2. Asphalt Base Course: Minimum surface temperature of 40 deg. F and rising at the time of placement.
  - 3. Asphalt Surface Course: Minimum surface temperature of 60 deg. F at time of placement.

1.6 SUBMITTALS

- A. Job Mix Designs: For each job mix proposed for the Work.
- B. Material Test Reports: For each paving material
- C. Material Certificates: For each paving material, signed by the provider.

2. PRODUCTS

2.1 AGGREGATES

- A. Course Aggregate: ASTM D 692, sound angular crushed stone, crushed gravel or properly cured crushed blast furnace slag.
- B. Fine Aggregate: ASTM D 1073, sharp edged natural sand or sand prepared from stone, gravel, properly cured blast furnace slag, or combination thereof.
- C. Mineral Filler: ASTM D 242, rock or slag dust, hydraulic cement, or other inert material.

2.2 ASPHALT MATERIALS

- A. Asphalt Binder: AASHTO MP 1, PG 64-22 conforming to the requirements of IDOT Specifications.
- B. Tack Coat: AASHTO M 140 emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.
- C. Water: Potable only

2.3 MIXES

- A. Hot-Mix Asphalt: Dense, hot-laid, hot mix asphalt plant mixes. Furnish job-mix formulas for each pavement type, conforming to the requirements of IDOT Specifications. Mix aggregates and bituminous materials in accordance with the requirements of IDOT Specifications. Mix to comply with the following requirements:
  - 1. Provide mixes with a history of satisfactory performance in geographical area of the Project that are suitable for the intended purpose.

3. EXECUTION

3.1 EXAMINATION

- A. Verify that subgrade is unfrozen, free of water, snow and ice and is otherwise in suitable condition to support paving and imposed loads.
- B. Proof-roll subbase using heavy, pneumatic-tired rollers to locate areas that are unstable or that require further compaction. Scarify, regrade and recompact surface of subgrade that is pumping or deforming as required to provide true levels, uniform slopes and proper total thickness of paving.
- C. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 PATCHING

- A. Hot-Mix Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches extending 12 inches into adjacent sound pavement unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound aggregate base course to form new subgrade.
- B. Tack Coat: Apply uniformly to vertical surfaces abutting or projecting into new, hot-mix asphalt paving at a rate of 0.05 to 0.20 gal/s.y.
- C. Patching: Partially fill excavated pavements with hot-mix asphalt base mix and while still hot, compact. Cover asphalt base course with compacted hot-mix surface layer finished flush with adjacent surfaces.

3.3 SURFACE PREPARATION

- A. Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.
  - 1. Sweep loose granular particles from surface of unbound aggregate base course. Do not dislodge or disturb aggregate embedded in compacted surface of the base course.
- B. Tack Coat: apply uniformly to surfaces of existing pavement (including base course) and exposed concrete wall footings at the rate indicated above.
  - 1. Allow tack coat to cure undisturbed before applying hot-mix paving.
  - 2. Provide adequate protection to avoid smearing or staining adjoining surfaces. Immediately remove spillages and clean affected areas.

3.4 HOT-MIX ASPHALT PLACING

- A. Machine place hot-mix asphalt on prepared surface, spread uniformly and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of the mix. Place each course to required grade, cross section and thickness when compacted.

1. Place surface course in a single 2” lift.
  2. Spread mix at not less than 250 degrees in accordance with IDOT Specifications.
  3. Regulate paver machine speed to obtain a smooth continuous surface, free of pulls and tears in asphalt paving mat.
- B. Place paving in consecutive strips not less than 10 feet wide unless infill edge strips of a lesser width are required.
1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete a section of asphalt base course before placing asphalt surface course.
- C. Promptly correct surface irregularities in paving course behind the paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix. Use suitable hand tools to smooth the surface.

### 3.5 JOINTS

- A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions with same texture and smoothness as other sections of the hot-mix asphalt course.
1. Clean contact surfaces and apply tack coat to joints.
  2. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
  3. Compact asphalt at joints to a density within 2% of specified course density.

### 3.6 COMPACTION

- A. Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot hand tampers or vibratory plate compactors in areas that are inaccessible to rollers.
1. When paving surface temperature falls below 185 deg. F no further compaction effort will be permitted unless otherwise approved.
- B. Breakdown Rolling: Complete breakdown, or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade and smoothness. Correct laydown and rolling operations to comply with requirements.
- C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until course has been uniformly compacted to the following density:
1. Pavement shall be compacted to a density of 92% - 96% of the maximum theoretical density determined by IDOT Specifications. Field density determination will be in accordance with IDOT Specification Procedure.
- D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.

DIVISION 32 – EXTERIOR IMPROVEMENTS

**Section 32 12 16 – Asphalt Paving**

- E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.
- F. Repairs: Removed paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to the specified density and surface smoothness.
- G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
  - 1. Erect barricades to prevent paving from traffic until mixture has cooled enough not to become marked.

3.7 INSTALLATION TOLERANCES

- A. Thickness: Compact each course to produce the thickness indicated on the drawings within the following tolerances:
  - 1. Base Course: Plus or minus ¼ inch
  - 2. Surface Course: Plus ¼ inch. No minus
- B. Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:
  - 1. Base Course: ¼ inch
  - 2. Surface Course: 3/16 inch

3.8 FIELD QUALITY CONTROL

- A. Testing Agency: IDOT personnel qualified to perform on-site testing will perform field tests and prepare reports.
- B. Additional testing to ensure corrective action is satisfactory will be performed at the Contractor's expense for any Work in place that does not meet Project requirements.
- C. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that the Work does not comply with specified requirements.

3.9 DISPOSAL

- A. Promptly remove surplus and/or excavated materials from work area and dispose of on-site in the area(s) so designated by IDOT site personnel.

END 32 12 16

1. GENERAL

1.1 WORK INCLUDES

- A. General Contractor provide design and complete installation of steel reinforced exterior cement concrete pavement for the following:
  - 1. 24' x 24' Pitched containment slab sloped to inlet as indicated on the plans and specified herein.

1.2 RELATED WORK

- A. Specified elsewhere:
  - 1. 31 23 00 Excavating, Backfilling & Compacting
  - 2. 32 01 00 Surface Restorations
  - 3. 32 12 16 Asphalt Paving
  - 4. 33 41 00 Storm Drainage Piping

1.3 REFERENCES

- A. IDOT Standard Specifications for Road and Bridge Construction, April 1, 2016 and IDOT Supplemental Specifications and Recurring Special Provisions adopted January 1, 2018 except:
  - 1. Methods of Measurement and Basis of payments do not apply.
  - 2. References to “Engineer” shall mean “Architect/Engineer.”

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products who complies with ASTM C 94/C 94M requirements for production facilities and equipment.
- B. ACI Publications: Comply with ACI 301-10, “Specifications for Structural Concrete” (2010 edition)
- C. ACI 306.1-90 “Standard Specification for Cold Weather Concreting”

1.5 SUBMITTALS

- A. Design Mixtures: For each concrete pavement mixture provided.

2. PRODUCTS

2.1 STEEL REINFORCEMENT

- A. Epoxy Coated Reinforcing Bars: ASTM A 775/A 775M, Grade 60; deformed.

- B. Bar Supports: Bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcing bars and dowels in place manufactured according to CRSI's "Manual of Standard Practice."

## 2.2 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials of the same type, brand and source.
  - 1. Portland Cement: ASTM 150, Type 1, (grey) supplement with the following:
    - a. Fly Ash: ASTM C 618 Class C or F.
    - b. Ground-Granulated Blast Furnace Slag: ASTM C 989, Grade 100 or 120.
- B. Normal Weight Aggregate: ASTM C 33 coarse aggregate, uniformly graded, 1" nominal size.
- C. Water: ASTM C 94/C 94M

## 2.3 ADMIXTURES

- A. Air Entraining Admixture: ASTM C 260
- B. Chemical Admixtures: ASTM C 494/C 494M, of type suitable for application Certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

## 2.4 CURING MATERIALS

- A. Moisture Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- B. Evaporation Retarder: Waterborne, non-molecular film forming; manufactured for application to fresh concrete.
- C. Clear Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B

## 2.5 RELATED MATERIALS

- A. Expansion and Isolation Joint Filler Strips: ASTM D 1751, asphalt saturated cellulosic fiber.

## 2.6 CONCRETE MIXTURES

- A. Prepare design mixture proportioned according to ACI 301 with the following properties:
  - 1. Compressive Strength: 3500 psi (28 days)
  - 2. Maximum Water-Cementitious Materials Ratio: 0.45 at point of placement.
  - 3. Slump Limit: 4 inches, plus or minus 1 inch.



4. Air Content: maintain within range permitted by ACI 301.

## 2.7 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch and mix concrete materials and concrete according to ASTM C 94/C 94M. Furnish batch certificates for each batch discharged and used in the Work.
- B. When air temperature is above 90 deg. F, reduce mixing and delivery time to no more than 60 minutes

## 3. EXECUTION

### 3.1 PLACING AGGREGATE BASE

- A. Place aggregate in not more than four inch (4”) evenly distributed lifts and compact each lift as specified in Section 312300.
- B. Depth of aggregate base shall be a minimum of eight inches (8”) when fully compacted to specification.

### 3.2 EDGE FORMS AND SCREED CONSTRUCTION

- A. Set, brace and secure edge forms, bulkheads and intermediate screed guides for pavement to required lines, grades and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after placement.

### 3.3 STEEL REINFORCEMENT

- A. Comply with CRSI’s “Manual of Standard Practice” for fabricating, placing and supporting reinforcement.

### 3.4 JOINTS

- A. Construction Joints: Set at side and end terminations of concrete pavement and at locations where pavement operations are stopped for more than ½ hour unless pavement terminates at an isolation joint.
- B. Isolation Joints: Form from premolded joint-filler strips. Install abutting concrete curb, catch basins and pipe bollard bases.
- C. Contraction Joints: Form tooled weakened plane contraction joints, sectioning concrete containment pitch pan slab as indicated on drawings. Construct joints to be not less than ¾” deep nor more than one fourth of the concrete slab thickness.
- D. Edging: Tool edges of pavement, gutters and joints in concrete after initial floating with an edging tool to a 3/8” radius. Repeat tooling of edges after surface finishing. Eliminate tool marks on concrete surfaces.

### 3.5 CONCRETE PLACEMENT

- A. Moisten subbase to provide a uniform dampened condition at time concrete is placed.

- B. Comply with ACI 301 requirements for measuring, mixing, transporting and placing concrete.
- C. Screed pavement surfaces with a straightedge and strike off.
- D. Screed gutter surfaces to concave form indicated on drawings to form a continuous trough and strike off.
- E. Commence initial floating to impart an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations.

### 3.6 FLOAT FINISHING

- A. Do not add water to concrete surfaces during finishing operations.
- B. Begin the second floating operation when bleed water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface by hand. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.
  - 1. Medium-to-Fine Textured Broom Finish: Draw a soft bristle broom across float finished surface to provide a uniform, fine-line texture.

### 3.7 CONCRETE PROTECTION AND CURING

- A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- B. Evaporation Retarder: Apply to concrete surfaces if dry, hot or windy conditions cause moisture loss before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding and bull floating or darbying concrete but before final float finishing.
- C. Cure Methods: Cure concrete by moisture retaining cover, curing compound, or a combination of these methods.

### 3.8 REPAIRS AND PROTECTION

- A. Protect concrete from damage. Exclude traffic from pavement for at least 14 days after placement.
- B. Remove and replace concrete pavement that is broken, damaged or defective or, that does not comply with requirements of this Section.
- C. Maintain concrete pavement free of stains, discoloration, dirt and other foreign material. Broom sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

END 33 41 00

1. GENERAL

1.1 WORK INCLUDES

A. BASE BID

1. Contractor provide:
  - a. New precast inlet and gravity flow, non-pressure storm drainage piping connected to existing structure as indicated on the drawings.
  - b. Modify existing drainage structure as indicated on plans to install new 8” diameter PVC gravity flow storm sewer pipe.
  - c. Upon completion of all work at the existing structure being tied in to, Contractor shall remove and promptly dispose of all deleterious materials and built-up sediment to restore capacity of the structure.

1.2 RELATED WORK

A. Specified elsewhere:

1. 31 23 00 Excavating, Backfilling & Compacting
2. 32 01 00 Surface Restoration, Grading & Seeding
3. 32 12 16 Asphalt Paving
4. 32 75 10 Cement Concrete Pavement

1.3 PERFORMANCE REQUIREMENTS

- A. Gravity flow, non-pressure drainage piping pressure rating: 10 foot head of water.

1.4 REGULATORY REQUIREMENTS

- A. Comply with applicable sections of the IDOT Standard Specifications for Road and Bridge Construction, April 1, 2016 edition and especially:

1.6 SUBMITTALS

- A. Product Data: For each type of product submitted.

2. PRODUCTS

2.1 PVC PIPE AND FITTINGS

- A. Pipe shall be constructed of quality PVC resin, compounded to provide physical and mechanical properties that equal or exceed cell class 12454 or 12364 as defined in ASTM D1784. Sized as indicated on the drawings suitable for use as a gravity sewer conduit and meeting the requirements of ASTM F794 and D3034 with bell and spigot ends for gasketed joints with elastomeric seals.

- B. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include one of the following or an approved equal as submitted to and accepted by the CDB Representative.:
  - 1. Contech Engineered Solutions LLC – West Chester, OH
  - 2. Cresline Plastic Pipe Co., Inc. – Evansville, IN
  - 3. GF Harvel LLC – Easton, PA
  - 4. JM-Eagle (JM Manufacturing Co., Inc.) – Livingston, NJ
  - 5. North American Pipe Corporation – Houston, TX (IL Plant in Litchfield)

## 2.2 NONPRESSURE-TYPE PIPE COUPLINGS

- A. Comply with ASTM C 1173, elastomeric, sleeve-type reducing or transition coupling for joining underground non-pressure piping. Include ends of same sizes as piping to be joined and corrosion-resistant, metal tension band and tightening mechanism on each end.
- B. Sleeve Materials For Plastic Pipes: ASTM F 477, elastomeric seal.
- C. Unshielded Flexible Couplings: Non-pressure type flexible coupling consisting of elastomeric sleeve with corrosion-resistant, metal tension band and tightening mechanism on each end.
  - 1) Acceptable Manufacturers: C
    - a. Dallas Specialty & Mfg. Co.
    - b. Fernco Inc.
    - c. The Logan Clay Products Company
    - d. Mission Rubber Company (a division of MCP Industries, Inc.)
- D. Shielded Flexible Couplings: Non-pressure type flexible coupling consisting of elastomeric or rubber sleeve meeting ASTM C 1460 with full-length corrosion resistant outer shield with corrosion-resistant, metal tension band and tightening mechanism on each end.
  - 1. Acceptable Manufacturers: Subject to compliance with requirements, provide products by one of the following or an approved equal as submitted to and accepted by the CDB Representative.:
    - a. Cascade Waterworks Mfg.
    - b. Dallas Specialty & Mfg. Co.
    - c. Mission Rubber Company (a division of MCP Industries, Inc.)

## 2.3 INLET

- A. Standard Precast Concrete Basin: IDOT Inlet Type A, Standard Detail 602001-02, precast reinforced concrete of depth indicated on drawings with provision for sealant joints.

1. Base Section: Interlocking 4” thick prefabricated reinforced concrete floor with 3” thick minimum precast reinforced concrete wall sections.
  2. Joint Sealant: ASTM C 990 bitumen or butyl rubber.
  3. Acceptable Manufacturers: Manufacturers approved by IDOT to supply specified precast catch basin as indicated in the latest published edition of the IDOT – Bureau of Materials and Physical Research Approved List of Certified Precast Concrete Producers.
- B. Cast, Frame and Lids: IDOT Type 1, Standard Detail 604001-03 ductile iron open lid designed for structural loading with approximately 50% open area.
1. Acceptable Manufacturers: Subject to compliance with requirements, provide products by one of the following or an approved equal as submitted to and accepted by the CDB Representative.:
    - a. East Jordan Iron Works – East Jordan, MI
    - b. Neenah Enterprises, Inc. – Neenah, WI
    - c. U.S. Foundry (Eagle Manufacturing Group) – Medley, FL

### 3. EXECUTION

#### 3.1 PIPING INSTALLATION

- A. Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Install piping as indicated, to the extent practical. Where specific installation is not indicated, follow manufacturer’s written instructions.
- B. Install piping beginning at low point, true to grades and alignment indicated, with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves and couplings according to manufacturer’s written instructions for using lubricants, cements and other installation requirements.
- C. Install piping pitched down in direction of flow at a minimum slope of 1% unless otherwise indicated.
- D. Install piping with restrained joints at changes in direction. Use corrosion resistant rods, pipe, manufacturer’s proprietary restraint system, or cast-in-place concrete supports or anchors.
- E. Install piping below frost line. Minimum cover shall be 36 inches.
- F. Install PVC sewer piping according to ASTM D 2321 and ASTM F 1668.
- G. Pipe joint construction: Join PVC piping according to ASTM D2321 and ASTM 3034 for elastomeric joints.

#### 3.2 INLET INSTALLATION

- A. Set precast basin firm, level and true on aggregate base (sand) as per IDOT Standard Specifications.
- B. Set frames and grates to elevations indicated.

3.3 FIELD QUALITY CONTROL

- A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place and again at completion of installation.
  - 1. Defects requiring correction include the following:
    - a. Alignment: Less than full diameter of inside pipe is visible between structures.
    - b. Deflection: Flexible piping with deflection that prevents passage of a ball or cylinder of a size not less than 92.5% of the piping diameter.
    - c. Crushed, broken, cracked or otherwise damaged piping.
    - d. Infiltration: Water leakage into piping.
    - e. Exfiltration: Water leakage from or around piping.
  - 2. Replace defective piping using new materials and repeat inspections until defects are within allowances permitted.
- B. Test new piping systems and parts of existing systems that have been altered for leaks and defects.
  - 1. Do not enclose, cover or put into service before inspection and approval.
  - 2. Provide at least 24 hours advance notice to the Architect before conducting any activity requiring tests, inspections or observation.
  - 3. Test PVC sewer piping in accordance with ASTM F 1417
    - a. Replace defective piping using new materials and repeat inspections until defects are within allowances permitted.

END 33 41 00

CDB - PROJECT NUMBER 630-036-008

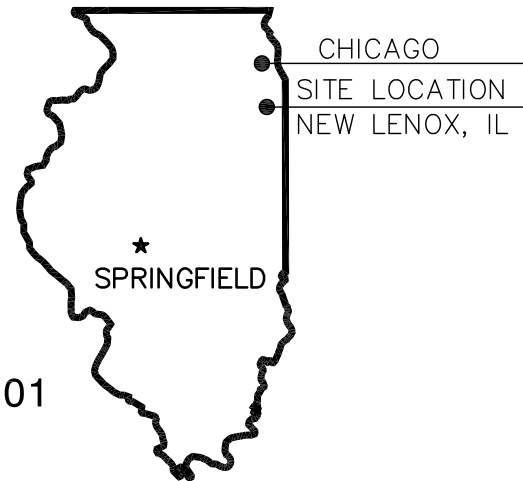
BRIDGING DOCUMENTS

CONSTRUCT SALT STORAGE BUILDING

DISTRICT - 1 MAINTENANCE YARD

NEW LENOX, WILL COUNTY ILLINOIS

CDB BUILDING INVENTORY NO. IDOT 036-0001



STATE LOCATION PLAN



AREA LOCATION PLAN

NORTH



INDEX OF DRAWINGS

- G-1 TITLE SHEET AND LOCATION PLANS
- C-1 SITE PLAN
- C-2 ENLARGED PLAN AND DETAILS
- C-3 GRADING PLAN
- A-1 FOUNDATION / FLOOR PLAN
- A-2 ELEVATIONS
- V-1 VENTILATION WORK
- E-1 ELECTRICAL WORK

FOR:

STATE OF ILLINOIS

CAPITAL DEVELOPMENT BOARD

USING AGENCY:

DEPARTMENT OF TRANSPORTATION

BY:

RKG DESIGN GROUP

16445 LEE AVENUE

ORLAND PARK, IL 60467

(708) 403-1812

CIVIL / STRUCTURAL ENGINEER:

MCCLURE ENGINEERING

ASSOCIATES, INC.

1138 COLUMBUS STREET

OTTAWA, ILLINOIS 61350

PHONE: (815) 433-2080



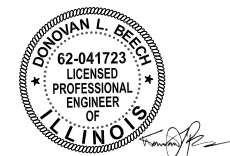
MECHANICAL / ELECTRICAL ENGINEER:

DYNACEPT ENGINEERING, INC.

2250 DEVON AVE.

DES PLAINES, IL 60018

PHONE: (847) 299-4848



**ALTERNATE BID LEGEND**

**ALTERNATE BID NO. G-1 (AB-G1):**  
 EXTEND THE BASE BID BUILDING DESIGN AN ADDITIONAL FIFTEEN FEET, (15' - 0") TO AN OVERALL LENGTH OF +/- 215'-0" (VARIES BY FABRIC ROOF MANUFACTURER). THE NORTH WALL LOCATION REMAINS SAME AS BASE BUILDING. THE INTERIOR HOLD DIMENSION BECOMES 212'-0". EXTENSION IS TO THE SOUTH. INCLUDE ALL REQUIRED STRUCTURAL AND ELECTRICAL COMPONENTS. NO ADDITIONAL INTERIOR, (FI) LIGHTING IS REQUIRED. LIGHTING PLAN AS INDICATED HEREIN SHALL REMAIN AS INDICATED. ONE ADDITIONAL BLOCK HEATER OUTLET ON WEST ELEVATION SHALL BE ADDED @ 15'- 0" O.C.. ADJUST SIZE OF EXHAUST FAN, INTAKE AND EXHAUST LOUVERS AS NECESSARY FOR THE INCREASED INTERIOR VOLUME OF THE BUILDING AS APPROPRIATE PER CODE. MAKE ALL ADJUSTMENTS TO FINAL GRADING DESIGN AS INDICATED ON PLANS FOR AB-G1.

**ALTERNATE BID NO. G-2 (AB-G2):**  
 EXTEND THE BASE BID BUILDING DESIGN AN ADDITIONAL THIRTY FEET, (30' - 0") TO AN OVERALL LENGTH OF +/- 230'-0" (VARIES BY FABRIC ROOF MANUFACTURER). THE NORTH WALL LOCATION REMAINS SAME AS BASE BUILDING. THE INTERIOR HOLD DIMENSION BECOMES 227'-0". EXTENSION IS TO THE SOUTH. INCLUDE ALL REQUIRED STRUCTURAL AND ELECTRICAL COMPONENTS, BASE BUILDING DESIGN INTERIOR LIGHTING, (FI FIXTURE) LAYOUT IS ADJUSTED AS FOLLOWS: SHIFT THE BASE BUILDING LAYOUT 30' SOUTH AND INSERT ONE ADDITIONAL ROW (2 ADDITIONAL FI FIXTURES) 30' NORTH OF THE NORTHERN MOST, (LAST) ROW. TWO ADDITIONAL BLOCK HEATER OUTLETS ON WEST ELEVATION SHALL BE ADDED AT 15'- 0" O.C.. ONE ADDITIONAL F2 WALL PACK FIXTURE SHALL BE ADDED TO THE WEST ELEVATION BY CHANGING THE SPACING TO THREE EQUAL SPACES BETWEEN THE FIXTURES AND MOVING THE END FIXTURES TO 25' INSET FROM EACH END WALL. ADJUST SIZE OF EXHAUST FAN, INTAKE AND EXHAUST LOUVERS AS NECESSARY FOR THE INCREASED INTERIOR VOLUME OF THE BUILDING AS APPROPRIATE PER CODE. MAKE ALL ADJUSTMENTS TO FINAL GRADING DESIGN AS INDICATED ON PLANS FOR AB-G2.

**MATERIAL LEGEND**

	RIGID INSULATION		INSULATION BATT		BACKFILLED EARTH		GRAVEL
	STEEL		PLYWOOD		CONCRETE		WOOD FINISH CARPENTRY
	ACOUSTICAL TILE		DEMO A.C.T. AND GRID		EXISTING A.C.T. AND GRID		NEW A.C.T. AND GRID

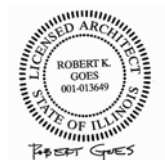
**SYMBOLS**

	ROOM NAME		DOOR TAG		TOP OF WALL 10'-0" AFF. ELEVATION REFERENCE		REVISION #
	ROOM DESIGNATION		CEILING HEIGHT		Section # WALL / BLDG. SECTION		REVISED AREA
	KEYNOTE		MALL TAG		Sheet #		Detail #
	STEEL NOTES		Elev. #		Detail Sheet #		
	GRID LINE BUBBLE						

NOTE: CONTRACTOR SHALL OBTAIN AND VERIFY ALL DIMENSIONS AND CONDITIONS AT JOB SITE AND BE FULLY RESPONSIBLE FOR SAME.

NEW LENOX FACILITY INVENTORY # IDOT 036-0001

REVISIONS			DRAWN	PREPARED
NO.	DATE	REMARKS		OFF.
			TRACED	APPROVED
			CHECKED	APPROVED



State of Illinois  
**Bruce Rauner, Governor**  
 Illinois Capital Development Board

PROJECT NO. 630-036-008	DATE 01/17/18
CONSTRUCT SALT STORAGE BUILDING BRIDGING DOCUMENTS DEPARTMENT OF TRANSPORTATION DISTRICT 1 NEW LENOX, WILL COUNTY	
<b>G-1</b>	
1 OF (8) SHEETS	

**WORK NOTES**

- 1 TRIM BACK ALL GROWTH SO THAT IT NO LONGER PROJECTS WEST OF FENCE LINE FULL LENGTH OF BUILDING. CUT, GRUB / REMOVE ALL VEGETATION GROWING WEST OF FENCE LINE. PREPARE AREA FOR NEW GRADING.
- 2 DIRECTIONALLY BORE NEW SERVICE CONDUIT FROM EXISTING BUILDING TO NEW BUILDING EXCAVATION. OPEN TRENCH PROHIBITED. TAKE CARE IN AREA OF EXIST. UNDERGROUND UTILITIES IN AREA.
- 3 NEW ELECTRICAL SERVICE CONDUIT CAN BE LAID ON TOP OF FOOTING ALONG NEW BUILDING.
- 4 MODIFY EXISTING DRAINAGE STRUCTURE AND EXTEND NEW PIPE FROM APRON STRUCTURE. INCLUDE COMPLETE CLEANING OF EXISTING STRUCTURE.

**SPECIAL NOTICE:**

THE OVERALL DIMENSIONS (LENGTH AND WIDTH) OF THE BUILDING ARE DETERMINED BY THE FABRIC STRUCTURE MANUFACTURER SELECTED FOR THE UPPER BUILDING STRUCTURE. CONTRACTOR SHALL COORDINATE WITH THE MANUFACTURER SELECTED AND MAKE ALL NECESSARY ADJUSTMENTS TO DIMENSIONS INDICATED HEREIN.

**ALTERNATE BID LEGEND**

**ALTERNATE BID NO. G-1 (AB-G1):**

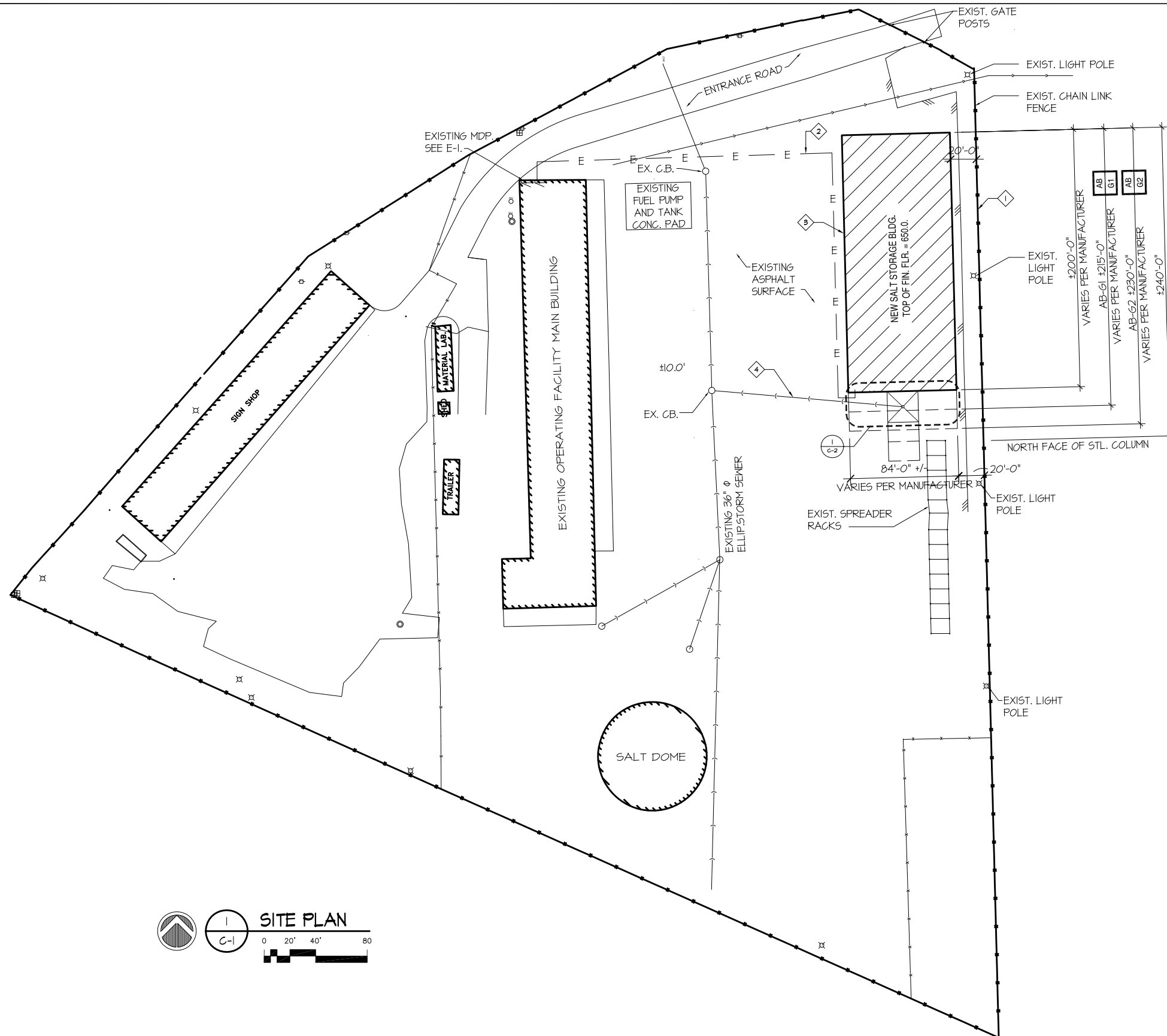
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AB  
G1

**ALTERNATE BID NO. G-2 (AB-G2):**

EXTEND THE BASE BID BUILDING DESIGN AN ADDITIONAL THIRTY FEET, (30' - 0") TO AN OVERALL LENGTH OF +/- 230'-0" (VARIES BY FABRIC ROOF MANUFACTURER). THE NORTH WALL LOCATION REMAINS SAME AS BASE BUILDING. THE INTERIOR HOLD DIMENSION BECOMES 227'-0". EXTENSION IS TO THE SOUTH. INCLUDE ALL REQUIRED STRUCTURAL AND ELECTRICAL COMPONENTS. BASE BUILDING DESIGN INTERIOR LIGHTING, (FI FIXTURE) LAYOUT IS ADJUSTED AS FOLLOWS: SHIFT THE BASE BUILDING LAYOUT 30' SOUTH AND INSERT ONE ADDITIONAL ROW, (2 ADDITIONAL FI FIXTURES) 30' NORTH OF THE NORTHERN MOST, (LAST) ROW. TWO ADDITIONAL BLOCK HEATER OUTLETS ON WEST ELEVATION SHALL BE ADDED AT 15'-0" O.C.. ONE ADDITIONAL F2 WALL PACK FIXTURE SHALL BE ADDED TO THE WEST ELEVATION BY CHANGING THE SPACING TO THREE EQUAL SPACES BETWEEN THE FIXTURES AND MOVING THE END FIXTURES TO 25' INSET FROM EACH END WALL. ADJUST SIZE OF EXHAUST FAN, INTAKE AND EXHAUST LOUVERS AS NECESSARY FOR THE INCREASED INTERIOR VOLUME OF THE BUILDING AS APPROPRIATE PER CODE. MAKE ALL ADJUSTMENTS TO FINAL GRADING DESIGN AS INDICATED ON PLANS FOR AB-G2.

AB  
G2



NOTE: CONTRACTOR SHALL OBTAIN AND VERIFY ALL DIMENSIONS AND CONDITIONS AT JOB SITE AND BE FULLY RESPONSIBLE FOR SAME.

NEW LENOX FACILITY  
INVENTORY # IDOT 036-0001

REVISIONS			DRAWN	PREPARED
NO.	DATE	REMARKS	TRACED	OFF. APPROVED
			CHECKED	APPROVED

**RKG**  
DESIGN GROUP, LLC  
16445 Lee Avenue  
Orland Park, IL 60467  
708.403.1812

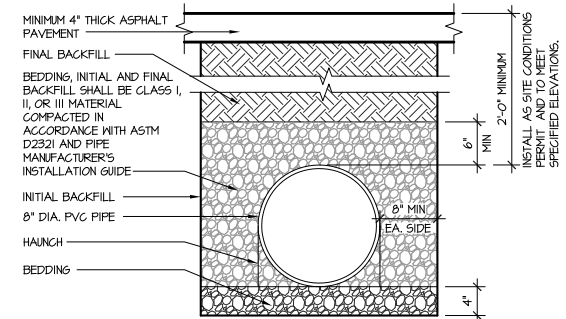


State of Illinois  
**Bruce Rauner, Governor**  
Illinois Capital Development Board

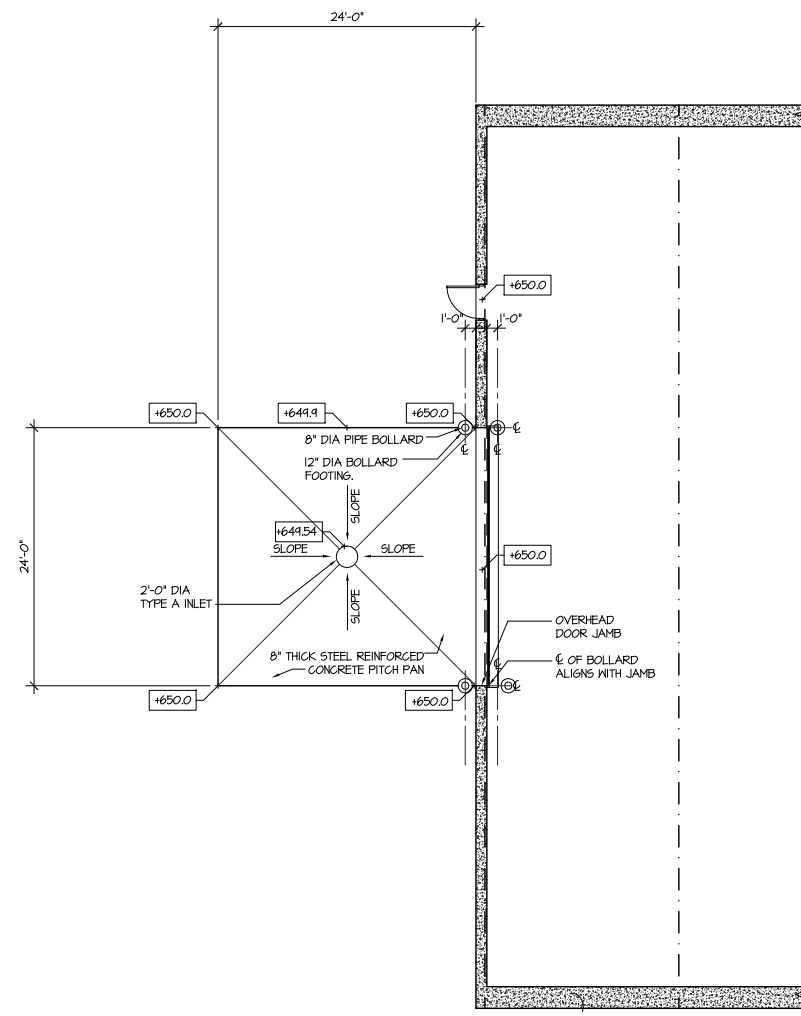
SITE PLAN  
CONSTRUCT SALT STORAGE BUILDING  
BRIDGING DOCUMENTS  
DEPARTMENT OF TRANSPORTATION DISTRICT 1  
NEW LENOX, WILL COUNTY

PROJECT NO.  
630-036-008  
DATE  
01/17/18  
SHEET NO.  
**C-1**  
2 OF (8) SHEETS





3 PVC BEDDING DETAIL  
C-2



1 ENLARGED PLAN AT APRON  
C2

PROVIDE WITH BASE BID AND ALL ALTERNATE BIDS

NOTE: CONTRACTOR SHALL OBTAIN AND VERIFY ALL DIMENSIONS AND CONDITIONS AT JOB SITE AND BE FULLY RESPONSIBLE FOR SAME.

NEW LENOX FACILITY  
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Orland Park, IL 60467  
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**CAPITAL Development BOARD**  
Building a Better Illinois

State of Illinois  
**Bruce Rauner, Governor**  
Illinois Capital Development Board

ENLARGED PLAN AND DETAILS  
CONSTRUCT SALT STORAGE BUILDING  
BRIDGING DOCUMENTS  
DEPARTMENT OF TRANSPORTATION DISTRICT 1  
NEW LENOX, WILL COUNTY

PROJECT NO.  
630-036-008  
DATE  
01/17/18  
SHEET NO.  
**C-2**  
3 OF (8) SHEETS

SITE BENCHMARKS	
DESCRIPTION	ELEVATION
BM #1: 'O' IN OPEN ON FIRE HYDRANT OUTSIDE OF GATE AT NORTHEAST CORNER OF SITE.	648.50
BM #2: SOUTHEAST CORNER OF EXISTING FUEL PUMP AND TANK CONCRETE PAD.	649.70

**LEGEND**

- x — x — EXISTING FENCE
- — — EXISTING SANITARY SEWER
- — — EXISTING STORM SEWER
- — — PROPOSED STORM SEWER
- 650 — PROPOSED CONTOUR
- 648 — EXISTING CONTOUR
- ⊗ EXISTING LIGHT POLE
- ← EX. DRAINAGE FLOW DIRECTION
- (649.5) EXISTING SPOT ELEVATION
- 649.5 PROPOSED SPOT ELEVATION
- 649.5 AB-G2 SPOT ELEVATION
- ▭ PROPOSED ASPHALT PAVEMENT

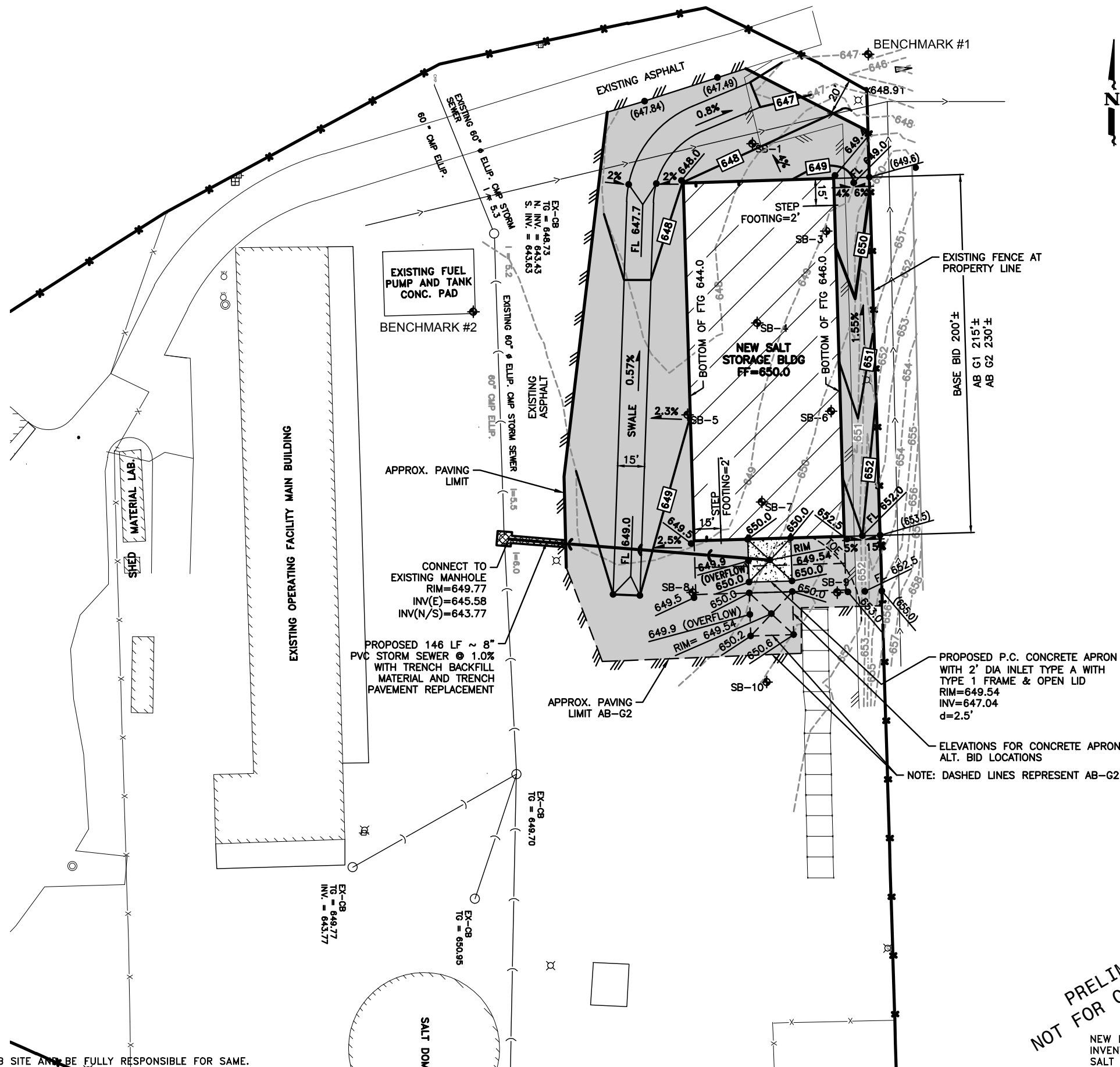
**ALTERNATE BID LEGEND**

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**ALTERNATE BID NO. G-2 (AB-G2):**

EXTEND THE BASE BID BUILDING DESIGN AN ADDITIONAL THIRTY FEET, (30'-0") TO AN OVERALL LENGTH OF +/- 230'-0" (VARIES BY FABRIC ROOF MANUFACTURER). THE NORTH WALL LOCATION REMAINS SAME AS BASE BUILDING. THE INTERIOR HOLD DIMENSION BECOMES 227'-0". EXTENSION IS TO THE SOUTH. INCLUDE ALL REQUIRED STRUCTURAL AND ELECTRICAL COMPONENTS. BASE BUILDING DESIGN INTERIOR LIGHTING, (F1 FIXTURE) LAYOUT IS ADJUSTED AS FOLLOWS: SHIFT THE BASE BUILDING LAYOUT 30' SOUTH AND INSERT ONE ADDITIONAL ROW, (2 ADDITIONAL F1 FIXTURES) 30' NORTH OF THE NORTHERN MOST, (LAST) ROW. TWO ADDITIONAL BLOCK HEATER OUTLETS ON WEST ELEVATION SHALL BE ADDED AT 15'-0" O.C.. ONE ADDITIONAL F2 WALL PACK FIXTURE SHALL BE ADDED TO THE WEST ELEVATION BY CHANGING THE SPACING TO THREE EQUAL SPACES BETWEEN THE FIXTURES AND MOVING THE END FIXTURES TO 25' INSET FROM EACH END WALL. ADJUST SIZE OF EXHAUST FAN, INTAKE AND EXHAUST LOUVERS AS NECESSARY FOR THE INCREASED INTERIOR VOLUME OF THE BUILDING AS APPROPRIATE PER CODE. MAKE ALL ADJUSTMENTS TO FINAL GRADING DESIGN AS INDICATED ON PLANS FOR AB-G2.



**1 CONCEPT GRADING & PAVING PLAN**  
C1 0 30 60

NOTE: CONTRACTOR SHALL OBTAIN AND VERIFY ALL DIMENSIONS AND CONDITIONS AT JOB SITE AND BE FULLY RESPONSIBLE FOR SAME.

**PRELIMINARY  
NOT FOR CONSTRUCTION**

NEW LENOX FACILITY  
INVENTORY # IDOT036-0001  
SALT STORAGE BUILDING

REVISIONS		
NO.	DATE	REMARKS

DRAWN	PREPARED
TRACED	APPROVED
CHECKED	APPROVED

**McClure**  
Engineering Associates, Inc.  
1138 Columbus Street  
Phone: (815) 433-2080  
Ottawa, Illinois 61350  
Fax: (815) 433-5930  
Design Firm License: Illinois 184-000816  
JOB: NLE 06-15-17-086

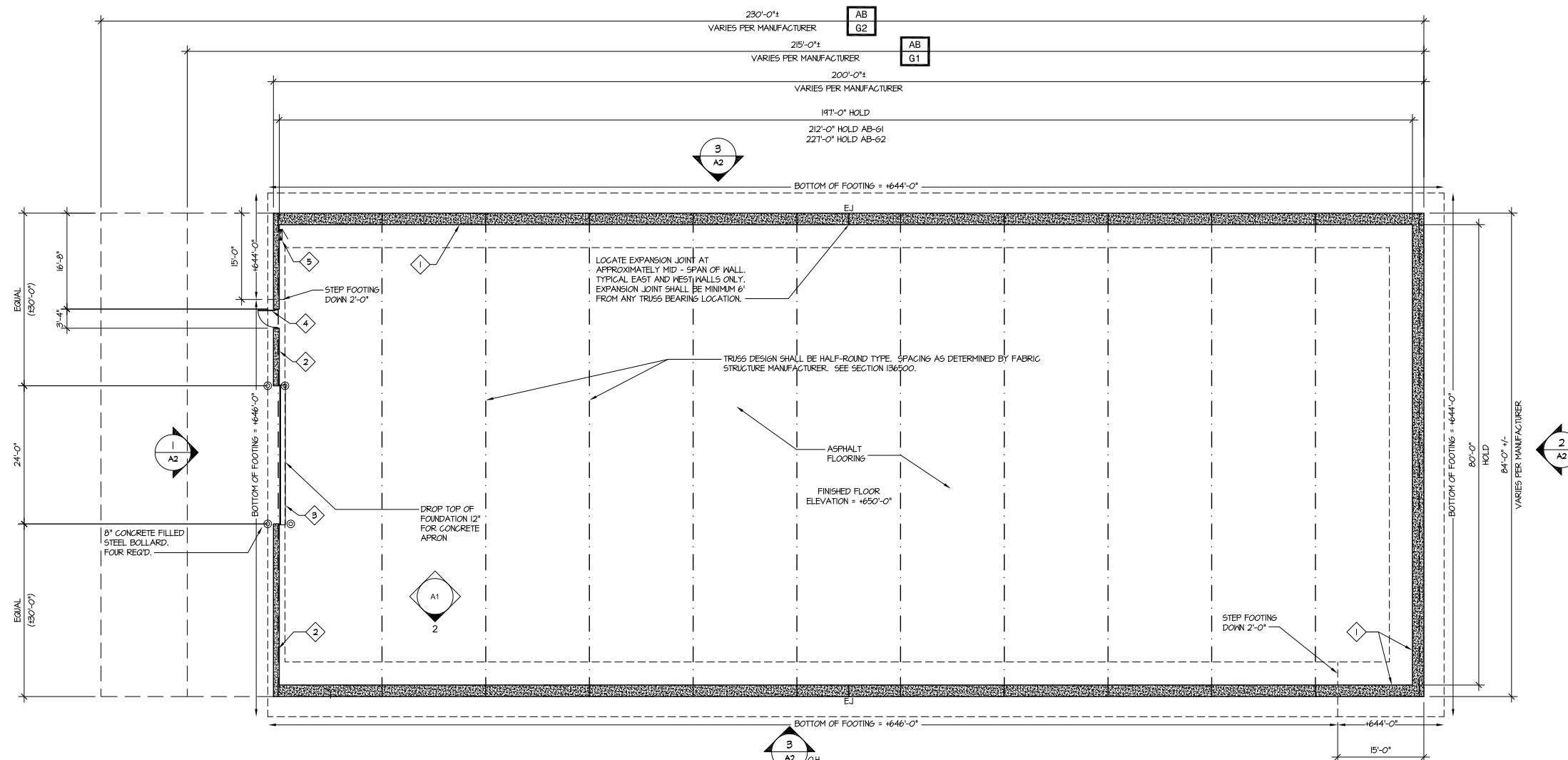
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**CAPITAL  
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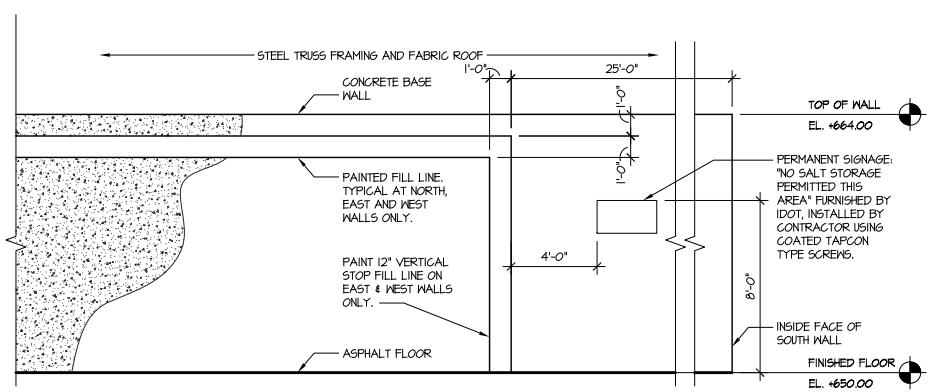
State of Illinois  
**Bruce Rauner, Governor**  
Illinois Capital Development Board

**CONCEPT GRADING AND PAVING PLAN**  
CONSTRUCT SALT STORAGE BUILDING  
BRIDGING DOCUMENTS  
DEPARTMENT OF TRANSPORTATION DISTRICT 1  
NEW LENOX, WILL COUNTY

PROJECT NO. 630-036-008
DATE 01/17/16
SHEET NO. <b>C-3</b>
4 OF (8) SHEETS



**1 FOUNDATION / FLOOR PLAN**  
 0 5' 10' 20'



**2 PARTIAL INTERIOR ELEVATION**  
 0 2' 4' 8'

**WORK NOTES**

- 1 STEEL REINFORCED CONCRETE WALL, FOUNDATION & FOOTING DESIGNED BY DBE TO WITHSTAND ALL LOADS INCLUDING OUTWARD PRESSURE OF SALT STORED.
- 2 STEEL REINFORCED CONCRETE BASE WALL, FOUNDATION & FOOTING DESIGNED BY DBE TO WITHSTAND ALL LOADS EXCEPT OUTWARD PRESSURE OF SALT STORED.
- 3 14' X 24' COILING OVERHEAD DOOR WITH MOTORIZED OPERATOR. SEE SPEC SECTION 083300.
- 4 3'-0" X 7'-0" GALVANIZED HOLLOW METAL INSULATED SERVICE DOOR WITH GALVANIZED FRAME. SEE SPECIFICATIONS 08113 AND 081100.
- 5 NEW ELECTRICAL SERVICE PANEL LOCATION. LOCATE ALL CONTROLS IN AREA OF SERVICE PANEL.

**SPECIAL NOTICE:**  
 THE OVERALL DIMENSIONS (LENGTH AND WIDTH) OF THE BUILDING ARE DETERMINED BY THE FABRIC STRUCTURE MANUFACTURER SELECTED FOR THE UPPER BUILDING STRUCTURE. CONTRACTOR SHALL COORDINATE WITH THE MANUFACTURER SELECTED AND MAKE ALL NECESSARY ADJUSTMENTS TO DIMENSIONS INDICATED HEREIN.

NOTE: CONTRACTOR SHALL OBTAIN AND VERIFY ALL DIMENSIONS AND CONDITIONS AT JOB SITE AND BE FULLY RESPONSIBLE FOR SAME.

NEW LENOX FACILITY  
 INVENTORY # IDOT 036-0001

REVISIONS			DRAWN	PREPARED	OFF.
NO.	DATE	REMARKS			
			TRACED	APPROVED	
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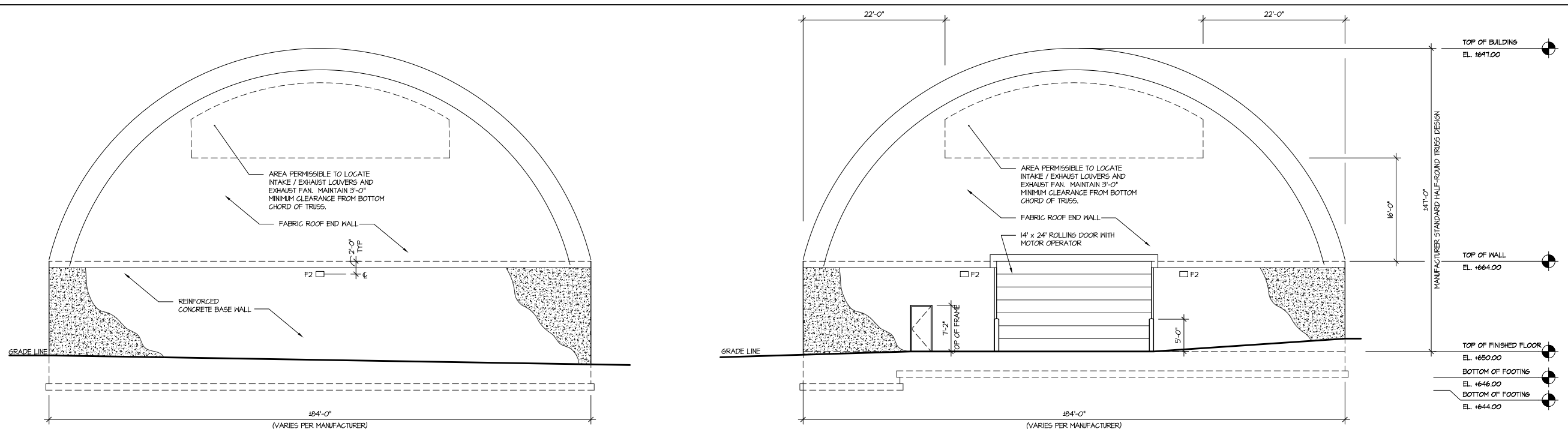
**RKG**  
 DESIGN GROUP, LLC  
 16445 Lee Avenue  
 Orland Park, IL 60467  
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 Illinois Capital Development Board

FOUNDATION / FLOOR PLAN  
 CONSTRUCT SALT STORAGE BUILDING  
 BRIDGING DOCUMENTS  
 DEPARTMENT OF TRANSPORTATION DISTRICT 1  
 NEW LENOX, WILL COUNTY

PROJECT NO.  
 630-036-008  
 DATE  
 01/17/18  
 SHEET NO.  
**A-1**  
 5 OF (8) SHEETS



**2 NORTH ELEVATION**  
A2 0 4' 8' 16'

**1 SOUTH ELEVATION**  
A2 0 4' 8' 16'

**3 WEST ELEVATION** (EAST ELEVATION OPPOSITE HAND, SIMILAR)  
A2 0 4' 8' 16'

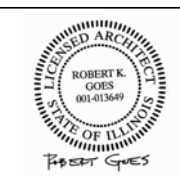
REFER TO ALTERNATE BID LEGEND ON TITLE SHEET G-1 FOR DESCRIPTIONS OF ALTERNATE BID WORK

AB	AB
G1	G2

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EXTERIOR ELEVATIONS  
CONSTRUCT SALT STORAGE BUILDING  
BRIDGING DOCUMENTS  
DEPARTMENT OF TRANSPORTATION DISTRICT 1  
NEW LENOX, WILL COUNTY

NEW LENOX FACILITY  
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**A-2**  
6 OF (8) SHEETS



**ALTERNATE BID G-2:**

PROVIDE TWO ADDITIONAL CO SENSORS AT MID-POINT OF THE BUILDING.

**LEGEND:**

- Ⓢ CARBON MONOXIDE DETECTOR SET TO 25 PPM, EACH DETECTOR SHALL COVERS APPROXIMATELY 4,000 SQUARE FEET OR PER MANUFACTURER,S RECOMMENDATION.
- Ⓜ MOTORIZED ACTUATOR

**KEY NOTES:**

- 1 INTAKE LOUVER—INSTALL LOUVERS WITHOUT DAMPERS.
- 2 EXHAUST LOUVER—INSTALL LOUVERS WITH MOTORIZED DAMPERS.
- 3 EXHAUST FAN AND LOUVER WITH BACKDRAFT DAMPER.
- 4 SEE DRAWING A-2 FOR PERMISSIBLE AREA FOR INSTALLATION OF LOUVERS AND EXHAUST FAN.
- 5 EXHAUST FAN, CO DETECTORS AND THE EXHAUST DAMPERS SHALL BE INTERCONNECTED.
- 6 CARBON DETECTOR MOUNTED AT BOTTOM CHORD OF TRUSS, LOCATE AS NECESSARY TO MAXIMIZE COVERAGE OF EACH SENSOR.


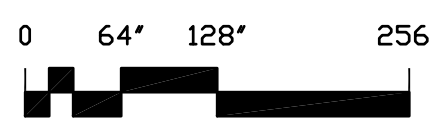
**GENERAL NOTES:**

- 1. MINIMUM RECOMMENDED MECHANICAL AIR FLOW, 0.75 CFM/SF FER IMC-201 LATEST EDITION.

**SEQUENCE OF OPERATION**

- 1. DURING NORMAL OPERATION, THE EXHAUST FAN SHALL BE OFF AND MOTORIZED EXHAUST DAMPERS SHALL BE CLOSED.
- 2. FOLLOWING A HIGH CO ALARM, THE EXHAUST FAN SHALL BE ON AND EXHAUST LOUVERS SHALL OPEN.
- 3. FOLLOWING A LOWERING OF CO, THE EXHAUST FAN SHALL BE OFF AND THE EXHAUST LOUVERS SHALL BE CLOSED.



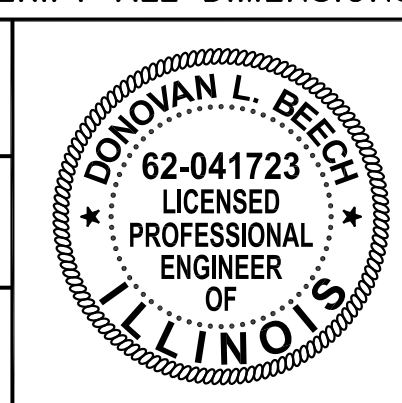
 1 VENTILATION PLAN  


NOTE: CONTRACTOR SHALL OBTAIN AND VERIFY ALL DIMENSIONS AND CONDITIONS AT JOB SITE AND BE FULLY RESPONSIBLE FOR SAME.

NEW LENOX FACILITY  
INVENTORY # IDOT036-0001

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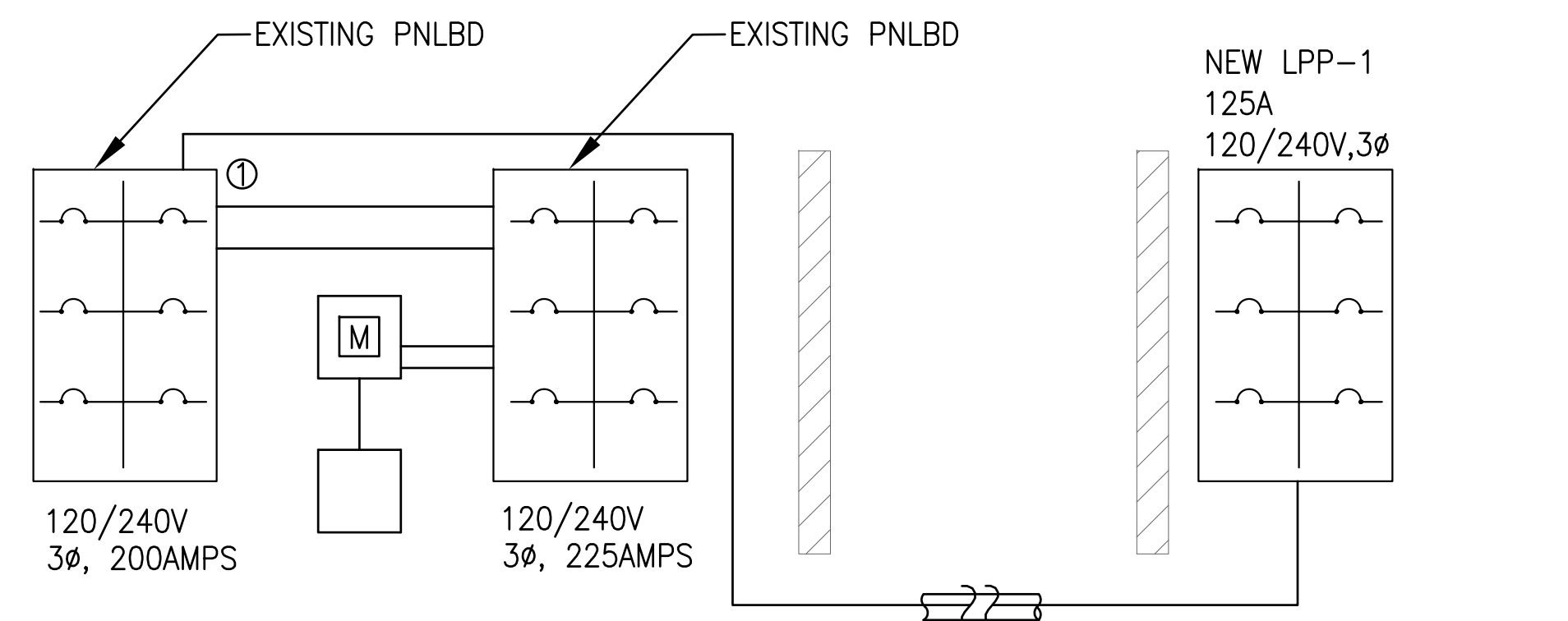
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VENTILATION PLAN  
 CONSTRUCT SALT STORAGE BUILDING  
 BRIDGING DOCUMENTS  
 DEPARTMENT OF TRANSPORTATION DISTRICT 1  
 NEW LENOX, WILL COUNTY

PROJECT NO. 630-036-000
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SHEET NO. <b>V-1</b>
7 OF ( 8 ) SHEETS



**EXISTING ELECTRICAL SERVICE**

① CONNECT TO EXISTING PANELBOARD LOCATED IN THE MAINTENANCE BUILDING. PROVIDE NEW 125A BREAKER.

DIRECTIONAL BORE FROM EXISTING ELECTRICAL ROOM TO NEW SALT STORAGE BUILDING EXCAVATION. SEE C-1

**ALTERNATE BID G-1**

PROVIDE ONE ADDITIONAL 20A BLOCK HEATER RECEPTACLE @15'-0" O.C

**ALTERNATE BID G-2**

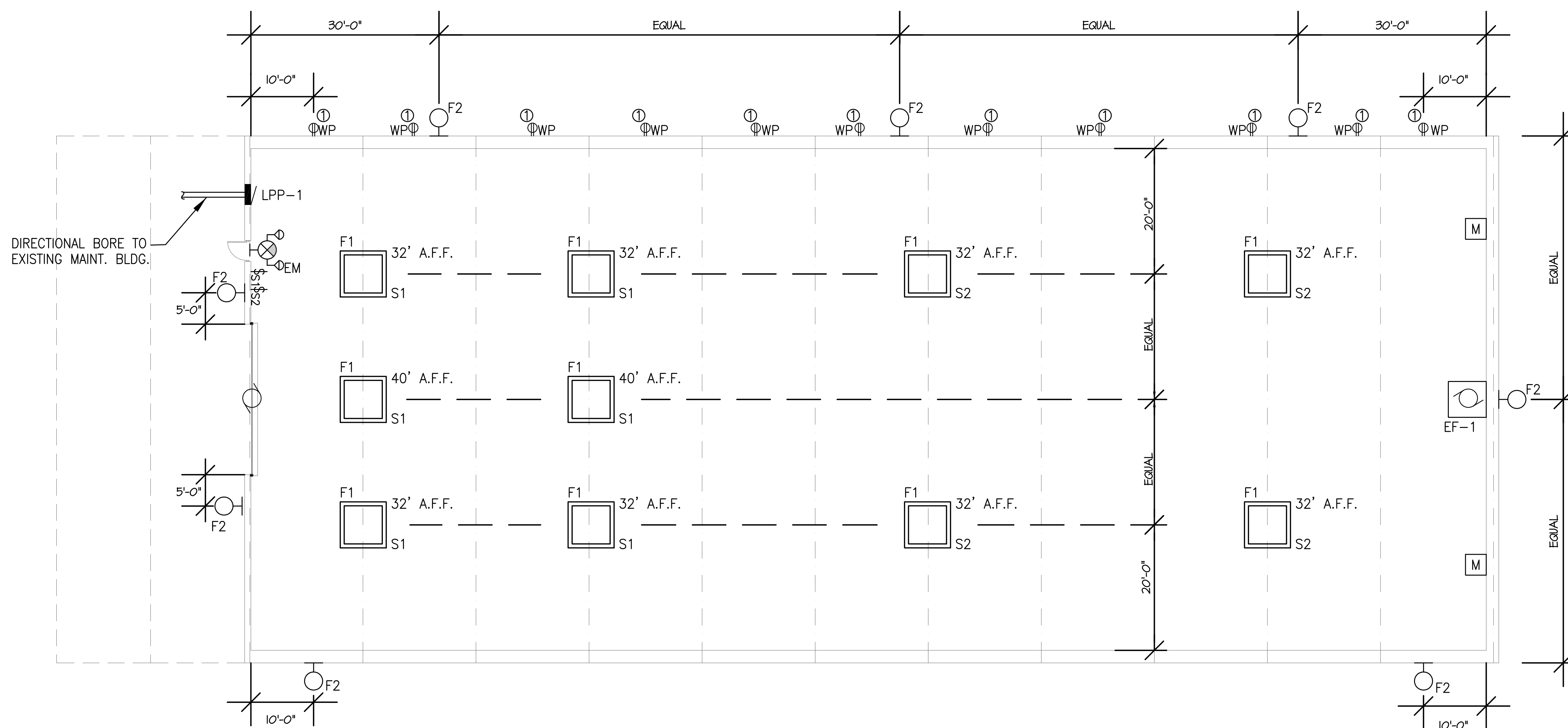
PROVIDE TWO ADDITIONAL 20A BLOCK HEATER RECEPTACLES @15'-0" O.C MOVE INTERIOR LIGHTING LAYOUT 30'-0" SOUTH OF LAYOUT SHOWN AND INSERT 2 ADDITIONAL LIGHTS ON NORTH END SWITCHED FROM WALL SWITCH S2. CHANGE F2 LAYOUT TO 25' INSET, AND ONE ADDITIONAL FIXTURE EQUALLY SPACED ON WEST WALL ONLY.

**NOTES:**

- F1- LIGHT FIXTURE SHALL BE LED, AND MADE FOR COLD WEATHER CORROSIVE ENVIRONMENT, INCLUDING ROAD SALTS, ETC. SUSPENDED FROM ROOF TRUSSES WITH STAINLESS STEEL THREADED ROD AND ANCHORING HARDWARE.
- F2- SURFACE MOUNTED WALL LIGHT FIXTURE; SHALL BE LED, WATERPROOF AND MANUFACTURED FOR EXTERIOR INSTALLATION.
- EM- COMBINATION EXIT SIGN/EM LIGHT SUITABLE FOR CORROSIVE ENVIRONMENT WITH LED.
- ALL ELECTRICAL RACEWAY AND DEVICES SHALL BE MANUFACTURED TO WITHSTAND CORROSIVE ENVIRONMENTS SUCH AS ROAD SALTS, ETC.

**LEGEND**

- ① DEDICATED 20A, WATERPROOF RECEPTACLES FOR BLOCK HEATERS. @15'-0" O.C.
- M MOTORIZED DAMPER
- ⊗ MOTORIZED DOOR



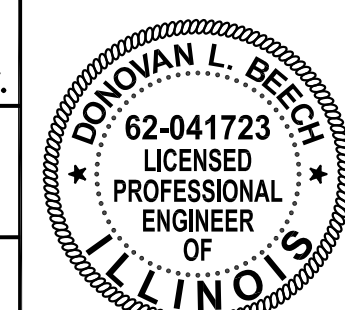
**ELECTRICAL FLOOR PLAN**  
 Scale: 0 64" 128" 256"  
 E-1

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NEW LENOX FACILITY  
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**ELECTRICAL FLOOR PLAN**  
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8 OF (8) SHEETS	