This addendum is issued on February 19, 2019 prior to the bid due date to add, delete, modify, clarify and/or to respond to questions submitted by prospective offerors regarding the work included in the above referenced solicitation.

**CHANGES, CLARIFICATIONS, ADDITIONS AND DELETIONS**

1. The bid due date has been **extended to Tuesday, February 26, 2109 at 2:00 PM.**
2. Mini-Power centers to be copper windings only. Specification provided for Mini-power center
3. Specification for 26 05 43 Underground Ducts and Raceways for Electrical Systems
4. Footer in for Specification 27 11 10 corrected. Footer was labeled 27 13 13 incorrectly

**QUESTIONS**

1. **Question:** Section 2.7 Fiber Reinforcement is specified:  
   a. Since slabs have welded wire mesh will fiber still be required?  
   Response: Fiber is required although WWF is being provided. Fiber is to prevent microcracking.

2. **Question:** Table of Contents – Division 08 – Openings – 08-42-29.23 Sliding Automatic Entrances  
   a. No Spec Section is Included – Please provide.  
   Response: Provided as attachment

3. **Question:** Section 088000 has two glazing makeups G1 & G2 and they are not identified on the drawings  
   a. Please identify the glazing types on the plans.  
   Response: Panels labeled as insulated glazing on AR05.01 below 2 feet off the concrete will be G1 (laminated) and glass above 2 feet will be G2.

4. **Question:** Drawing AR05.02 New Shelter Typical Elevations – depict insulated metal panels – the glazing specifications 088000 has no mention of an insulated metal panels.  
   a. Please provide the kind of metal panel and make up.  
   Response: Reference response to 28.b. in addendum #1
5. **Question:** Will there be a Phasing plan issued? The Summary 011000 indicates that the “owner intends to continue use of facility”.

   **Response:** Phasing plan to be provided by contractor and approved by architect/engineer/owner taking into consideration “owner intends to continue use of facility”

6. **Question:** Is the work by the CCTV vendor in the electrical contract?

   **Response:** Electrical Contractor is responsible for removal and installation of Wireless Equipment Pole only. Existing CCTV equipment removal and reinstallation to be by PPA CCTV vendor. Electrical Contractor to coordinate removal of equipment prior to removal of pole.

7. **Question:** Will specifications be issued for the exterior signage for this project?

   **Response:** See attached specification for illuminated signage above shelter. Reference response to question 32 in addendum #1

8. **Question:** Is the cutting & patching for the electrical contractors work in the Electrical Primes Contract?

   **Response:** See question #14 response in this addendum #2

9. **Question:** 011200-4-1.7-A-16-a Indicates the shelters are to be Pre-engineered structures but the specifications indicate them to be stick built. Which is correct?

   **Response:** The structures are not pre-engineered. Pre-engineered options can be submitted as long as the design intent remains.

10. **Question:** If the structures are to be pre-engineered what is the basis of design is and will specification be issued?

    **Response:** Reference response to question 9 in this addendum #2.

11. **Question:** 051200-2-17 Indicates AISC Install and Fabrication. Can these requirements be deleted?

    **Response:** The AISC requirements cannot be deleted or removed. If there is a hardship for this requirement submit in writing.

12. **Question:** Is the new ADA signage to be furnished & installed or is the existing signage to be reused?

    **Response:** New ADA signage shall be furnished and installed. Not reused.

13. **Question:** Can you please clarify who is responsible for saw cutting, removal & disposal of existing paving, excavation, concrete encasement for new underground conduits & backfill for both electrical & communications conduits?

    **Response:** See question #14 response in this addendum #2

14. **Question:** Detail 4/EL09.01 shows new asphalt or concrete (by others), does that mean all repaving of the areas where new UG electrical & communications conduits/handholes is by others?

    **Response:** Electrical Contractor is responsible for patching all excavation work necessary for conduits, ductbanks, hand holes, etc. Detail 4/EL09.01 to read “NEW ASPHALT OR CONCRETE BY EC CONTRACTOR”.

15. **Question:** Detail 3/SS04.01.

    a. Detail states to coordinate with CCTV contractor, who is the CCTV Contractor?
    b. Show a 49” LCD display, mount, antenna & wiring, who furnished & installs these?
Response:

a. PPA’s current CCTV maintenance contractor information to be provided by PPA at time of construction.

b. To be furnished by the electrical contractor

16. **Question:** Details 1/SS03.01 & 2/SS03.01, can more details be provided for the CCTV pole that needs to be reinstalled?

   **Response:** See detail 5/AR08.01 for detail of existing pole to be modified and welded to Shelter structure.

17. **Question:** Detail 4/SS04.01, this detail shows us cutting the existing telephone conduit & looping the existing UTP cabling for extension when the new guard booth is built & conduits installed.

   a. Show a 49” LCD display, mount, antenna & wiring, who furnishes & installs these?
   b. What happens if this cable gets damaged during construction?
   c. What happens if this cable is too short to extend into the new shelter construction?

   **Response:**

   a. To be furnished by the electrical contractor
   b. Contractor to protect cable during construction. If damaged, contractor to replace cable in kind. Contractor has option to provide new cable for project.
   c. Cable excavation is to provide new splice box and install new cable from excavation point to new shelter. Refer to detail 2/SS04.01

18. **Question:** Drawing ARO4.01 Forms and Surfaces Site Furnishings

   1. For the Vector Backed Bench:
      1. Please provide Model Number for Each Bench or Bench Configuration
      2. Hardwood or Aluminum Slat Selection?
      3. May standard powdercoat color be provided?
      4. Will any LED accent lighting be required?
      5. Side panel material, finish and any required perforation pattern.

   b. For the Techno RS Leaning Rail (? Perch Model)
      1. Please provide Model Number for each section.
      2. May standard powdercoat color be provided?

   c. For Bevel Waste Receptacle:
      1. May standard powdercoat color be provided?
      2. How many liners per receptacle are to be provided?

   **Response:** See attached PDF markup of detail 1/AR04.01 for the furniture

19. **Question:** Section 260543 Section 2.3 specifies Precast Concrete Handholes, is this for Power & Special Systems handholes? Drawing SS04.02 Detail 2 shows a H20 rated Composite “Quazite” handhole.

   **Response:** Electric Handholes are specified in Specification 26 05 43 Section 2.3. Communication handholes are specified in Specification 27 13 13 Section 2.4. Detail 2/SS04.02 does not specify Quazite. Contractor to refer to specs. Spec 26 05 43. Section 3.3-A.1 specifies units in roadways to be H-20 rated. Spec 27 13 13 Section 3.8-A.1 specifies units in roadways to be H-20 rated.

**END OF ADDENDUM TWO**
SECTION 262733
MINI-POWER CENTERS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the GENERAL REQUIREMENTS AND COVENANTS - DIVISION I, and the SPECIAL PROVISIONS - DIVISIONS IIA and IIB, which are hereby made a part of this Specification Section.

B. Examine all Drawings and all Sections of the Specifications for requirements and provisions affecting the Work of this Section.

1.2 SCOPE

A. The Contractor shall furnish and install three-phase general purpose individually mounted mini-power centers of the two-winding type, self-cooled, as specified herein and as shown on the contract drawings.

1.3 REFERENCES

A. The mini-power center and all components shall be designed, manufactured and tested in accordance with the latest applicable standards of UL, ANSI and NEMA.

1.4 SUBMITTALS

A. The following information shall to submitted to the Engineer:

1. Dimension drawing weights
2. Transformer ratings including:
   a. KVA
   b. Primary and secondary voltage
   c. Taps
   d. Primary and secondary continuous current
   e. Insulation class and temperature rise
   f. Sound level
3. Component ratings including:
   a. Voltage
   b. Continuous current
c. Interrupting ratings

4. Cable terminal sizes
5. Product data sheets

1.5 SUBMITTAL – FOR CONSTRUCTION

A. The following information shall be submitted for record purposes:

1. Final (as-built) drawings and information for items listed in Paragraph 1.04 and shall incorporate all changes made during the manufacturing process.
2. Connection diagrams
3. Installation information

1.6 QUALIFICATIONS

A. The manufacturer of the assembly shall be the manufacturer of the secondary distribution equipment.

B. For the equipment specified herein, the manufacturer shall be ISO 9001 or 9002 certified.

C. The manufacturer of this equipment shall have produced similar electrical equipment for a minimum period of five (5) years.

1.7 REGULATORY REQUIREMENTS

A. The assembly and all components shall be U.L. listed.

1.8 DELIVERY, STORAGE AND HANDLING

A. Equipment shall be handled and stored in accordance with manufacturer’s instructions. One (1) copy of these instructions shall be included with the equipment at time of shipment.

1.9 OPERATION AND MAINTENANCE MANUALS

A. Equipment operation and maintenance manuals shall be provided with each assembly shipped, and shall include instruction leaflets and instruction bulletins for the complete assembly and each major component.
PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Rex Power Magnetics (Basis of Design)

B. Eaton

C. Schneider Electric

D. Siemens Energy & Automation, Inc.

E. The listing of specific manufacturers above does not imply acceptance of their products that do not meet the specified ratings, features and functions. Manufacturers listed above are not relieved from meeting these specifications in their entirety. Products in compliance with the specification and manufactured by others not named will be considered only if pre-approved by the Engineer ten (10) days prior to the bid date.

2.2 RATINGS

A. kVA and voltage ratings shall be as shown on the drawings

B. Units shall be designed for continuous operation at rated kVA, for 24 hours a day, 365 days a year operation, with normal life expectancy as defined in ANSI C57.96

C. Low-Sound-Level Requirements: Maximum sound levels, when factory tested according to IEEE C57.12.91, as follows:

1. 9 kVA and Less: 40 dB.
2. 30 to 50 kVA: 45 dB.

2.3 CONSTRUCTION

A. Each mini-power center shall include a primary main breaker, an encapsulated dry-type transformer and a panelboard with secondary main breaker.

B. Primary main, secondary main and feeder breakers shall be enclosed with a padlockable hinged door.

C. Mini-power centers shall be suitable for service entrance application and labeled as such.

D. Insulation Systems
1. Transformers shall be insulated with a 180 degrees C insulation system and rated at 115 degrees C temperature rise
2. Required performance shall be obtained without exceeding the above-indicated temperature rise in a 40 degrees C maximum ambient, with a 30 degrees C average over 24 hours.
3. All insulation materials shall be flame-retardant and shall not support combustion as defined in ASTM Standard Test Method D635.

E. Core and Coil Assemblies

1. Transformer core shall be constructed with high-grade, non-aging, silicon steel with high magnetic permeability, and low hysteresis and eddy current losses. Maximum magnetic flux densities shall be substantially below the saturation point. The transformer core volume shall allow efficient transformer operation at 10% above the nominal tap voltage. The core laminations shall be tightly clamped and compressed. Coils shall be wound of electrical grade aluminum [copper optional] with continuous wound construction.
2. The core and coil assembly shall be completely encapsulated in a proportioned mixture of resin and aggregate to provide a moisture proof, shock-resistant seal. The core and coil encapsulation system shall minimize the sound level.
3. The core of the transformer shall be grounded to the enclosure
4. Provide two (2) 5% FCBN taps

2.4 BUS

A. Secondary bus shall be copper

2.5 WIRING/TERMINATIONS

A. All interconnecting wiring between the primary breaker and transformer, secondary main breaker and transformer and distribution section shall be factory installed.

B. All transformers shall be equipped with a wiring compartment suitable for conduit entry and large enough to allow convenient wiring.

2.6 MAIN DEVICES

A. Each mini-power center shall include a primary main breaker with an interrupting rating of 14 kA at 480 volts; and a secondary main breaker with an interrupting rating of 10 kA at 120/208

2.7 FEEDER DEVICES
A. The secondary distribution section shall accommodate one-inch bolt on breakers with 10 kA interrupting capacity.

2.8 ENCLOSURE

A. The enclosure shall be totally enclosed, non-ventilated, NEMA 4X with lifting provisions

PART 3 - EXECUTION

3.1 FACTORY TESTING

A. The following standard factory tests shall be performed on the equipment provided under this section. All tests shall be in accordance with the latest version of ANSI and NEMA.

1. Ratio tests at the rated voltage connection and at all tap connections
2. Polarity and phase-relation tests on the rated voltage connection
3. Applied potential tests
4. Induced potential test
5. No-load and excitation current at rated voltage on the rated voltage connection

3.2 INSTALLATION

A. The Contractors shall install all equipment per the manufacturer’s recommendations and the contract drawings.

3.3 FIELD ADJUSTMENTS

A. Adjust taps to deliver appropriate secondary voltage

3.4 FIELD TESTING

A. Measure primary and secondary voltages for proper tap settings.
SECTION 260543
UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Rigid nonmetallic duct.
   2. Duct accessories.

1.2 DEFINITIONS

A. Duct: A single duct or multiple ducts. Duct may be either installed singly or as component of a duct bank.

B. Duct Bank:
   1. Two or more ducts installed in parallel, with or without additional casing materials.
   2. Multiple duct banks.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings:
   1. Precast or Factory-Fabricated Underground Utility Structures:
      a. Include plans, elevations, sections, details, attachments to other work, and accessories.
      b. Include duct entry provisions, including locations and duct sizes.
      c. Include reinforcement details.
      d. Include frame and cover design and manhole chimneys.
      e. Include grounding details.
      f. Include dimensioned locations of cable rack inserts, pulling-in and lifting irons, and sumps.
      g. Include joint details.
1.4 INFORMATIONAL SUBMITTALS

A. Duct and Duct-Bank Coordination Drawings: Show duct profiles and coordination with other utilities and underground structures. Drawings shall be signed and sealed by a qualified professional engineer.

PART 2 - PRODUCTS

2.1 RIGID NONMETALLIC DUCT

A. Underground Plastic Utilities Duct: Type EPC-40-PVC RNC, complying with NEMA TC 2 and UL 651, with matching fittings complying with NEMA TC 3 by same manufacturer as duct.

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

1. ARNCO Corp.
2. Beck Manufacturing.
3. CANTEX INC.
7. ElecSys, Inc.
8. Electri-Flex Company.
9. Endot Industries Inc.
10. IPEX USA LLC.
11. Manhattan/CDT.

C. Listed and labeled as defined in NFPA 70, by a nationally recognized testing laboratory, and marked for intended location and application.

D. Solvents and Adhesives: As recommended by conduit manufacturer.

2.2 DUCT ACCESSORIES

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

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Allied Tube & Conduit; a part of Atkore International.
b. CANTEX INC.
c. Carlon; a brand of Thomas & Betts Corporation.
d. IPEX USA LLC.
e. PenCell Plastics.
f. Underground Devices, Inc.

B. Underground-Line Warning Tape: Comply with requirements for underground-line warning tape specified in Section 260553 "Identification for Electrical Systems."

2.3 PRECAST CONCRETE HANDHOLES AND BOXES

A. Description: Factory-fabricated, reinforced-concrete, monolithically poured walls and bottom unless open-bottom enclosures are indicated. Frame and cover shall form top of enclosure and shall have load rating consistent with that of handhole or box.

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

1. Christy Concrete Products.
2. Elmhurst-Chicago Stone Co.
3. Oldcastle Precast, Inc.
4. Rinker Group, Ltd.
5. Riverton Concrete Products.
6. Utility Concrete Products, LLC.
8. Wausau Tile Inc.

C. Comply with ASTM C 858 for design and manufacturing processes.

D. Frame and Cover: Weatherproof cast-iron frame, with cast-iron cover with recessed cover hook eyes and tamper-resistant, captive, cover-securing bolts.

E. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.

F. Cover Legend: Molded lettering, "ELECTRIC."

G. Configuration: Units shall be designed for flush burial and have open bottom unless otherwise indicated.

H. Extensions and Slabs: Designed to mate with bottom of enclosure. Same material as enclosure.

1. Extension shall provide increased depth of 12 inches.
2. Slab: Same dimensions as bottom of enclosure, and arranged to provide closure.
I. Joint Sealant: Asphaltic-butyl material with adhesion, cohesion, flexibility, and durability properties necessary to withstand maximum hydrostatic pressures at the installation location with the ground-water level at grade.

J. Knockout Panels: Precast openings in walls, arranged to match dimensions and elevations of approaching duct, plus an additional 12 inches vertically and horizontally to accommodate alignment variations.

K. Duct Entrances in Handhole Walls: Cast end-bell or duct-terminating fitting in wall for each entering duct.

L. Handholes 12 inches wide by 24 inches long and larger shall have inserts for cable racks and pulling-in irons installed before concrete is poured.

PART 3 - EXECUTION

3.1 PREPARATION

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

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

3.2 UNDERGROUND DUCT APPLICATION

A. Duct for Electrical Feeders 600 V and Less: RNC Type EPC-40-PVC, concrete-encased unless otherwise indicated.

B. Underground Ducts Crossing Driveways Roadways: RNC Type EPC-40 PVC, encased in reinforced concrete.

C. Stub-ups: Concrete-encased GRC.

3.3 UNDERGROUND ENCLOSURE APPLICATION

A. Handholes and Boxes for 600 V and Less:
1. Units in Roadways and Other Deliberate Traffic Paths: Precast concrete. AASHTO H-20, structural load rating.
2. Cover design load shall not exceed the design load of the handhole or box.

3.4 EARTHWORK

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

B. Restoration: Replace area immediately after backfilling is completed or after construction vehicle traffic in immediate area is complete.

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

D. Restore areas disturbed by trenching, storing of dirt, cable laying, and other work. Restore vegetation and include necessary topsoiling, fertilizing, liming, seeding, sodding, sprigging, and mulching.

E. Cut and patch existing pavement in the path of underground duct, duct bank, and underground structures. Restore per original condition.

3.5 DUCT AND DUCT-BANK INSTALLATION

A. Where indicated on Drawings, install duct, spacers, and accessories into the duct-bank configuration shown. Duct installation requirements in this Section also apply to duct bank.

B. Install duct according to NEMA TCB 2.

C. Slope: Pitch duct a minimum slope of 1:300 down toward manholes and handholes and away from buildings and equipment. Slope duct from a high point between two manholes, to drain in both directions.

D. Curves and Bends: Use 5-degree angle couplings for small changes in direction. Use manufactured long sweep bends with a minimum radius of 48 inches, both horizontally and vertically, at other locations unless otherwise indicated.

1. Duct shall have maximum of two 90 degree bends or the total of all bends shall be no more 180 degrees between pull points.

E. Joints: Use solvent-cemented joints in duct and fittings and make watertight according to manufacturer's written instructions. Stagger couplings so those of adjacent duct do not lie in same plane.
F. Installation Adjacent to High-Temperature Steam Lines: Where duct is installed parallel to underground steam lines, perform calculations showing the duct will not be subject to environmental temperatures above 40 deg C. Where environmental temperatures are calculated to rise above 40 deg C, and anywhere the duct crosses above an underground steam line, install insulation blankets listed for direct burial to isolate the duct bank from the steam line.

G. End Bell Entrances to Manholes and Concrete and Polymer Concrete Handholes: Use end bells, spaced approximately 10 inches o.c. for 5-inch duct, and vary proportionately for other duct sizes.

H. Terminator Entrances to Manholes and Concrete and Polymer Concrete Handholes: Use manufactured, cast-in-place duct terminators, with entrances into structure spaced approximately 6 inches o.c. for 4-inch duct, and vary proportionately for other duct sizes.

I. Building Wall Penetrations: Make a transition from underground duct to GRC at least 10 feet outside the building wall, without reducing duct line slope away from the building and without forming a trap in the line. Use fittings manufactured for RNC-to-GRC transition. Install GRC penetrations of building walls as specified in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

J. Sealing: Provide temporary closure at terminations of duct with pulled cables. Seal spare duct at terminations. Use sealing compound and plugs to withstand at least 15-psig hydrostatic pressure.


L. Concrete-Encased Ducts and Duct Bank:

1. Excavate trench bottom to provide firm and uniform support for duct.
2. Width: Excavate trench 3 inches wider than duct on each side.
3. Depth: Install so top of duct envelope is at least 24 inches below finished grade in areas not subject to deliberate traffic, and at least 30 inches below finished grade in deliberate traffic paths for vehicles unless otherwise indicated.
4. Support duct on duct spacers coordinated with duct size, duct spacing, and outdoor temperature.
5. Spacer Installation: Place spacers close enough to prevent sagging and deforming of duct, with not less than four spacers per 20 feet of duct. Place spacers within 24 inches of duct ends. Stagger spacers approximately 6 inches between tiers. Secure spacers to earth and to duct to prevent floating during concreting. Tie entire assembly together using fabric straps; do not use tie wires or reinforcing steel that may form conductive or magnetic loops around ducts or duct groups.
6. Minimum Space between Duct: 3 inches between edge of duct and exterior envelope wall, 2 inches between ducts for like services, and 4 inches between power and communications ducts.
7. Elbows: Use manufactured duct elbows for stub-ups, at building entrances, and at changes of direction in duct unless otherwise indicated. Extend encasement throughout length of elbow.

8. Reinforcement: Reinforce concrete-encased duct where crossing disturbed earth and where indicated. Arrange reinforcing rods and ties without forming conductive or magnetic loops around ducts or duct groups.

9. Forms: Use walls of trench to form side walls of duct bank where soil is self-supporting and concrete envelope can be poured without soil inclusions; otherwise, use forms.

10. Concrete Cover: Install a minimum of 3 inches of concrete cover between edge of duct to exterior envelope wall, 2 inches between duct of like services, and 4 inches between power and communications ducts.

11. Concreting Sequence: Pour each run of envelope between manholes or other terminations in one continuous operation.

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

3.6 INSTALLATION OF CONCRETE HANDHOLES

A. Precast Concrete Handhole Installation:

1. Comply with ASTM C 891 unless otherwise indicated.

2. Install units level and plumb and with orientation and depth coordinated with connecting duct, to minimize bends and deflections required for proper entrances.

3. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.

B. Elevations:

1. Handhole Roof: Install with rooftop at least 15 inches below finished grade.

2. Handhole Frame: In paved areas and trafficways, set frames flush with finished grade. Set other manhole frames 1 inch above finished grade.

3. Install handholes with bottom below frost line, below grade.

4. Handhole Covers: In paved areas and trafficways, set surface flush with finished grade. Set covers of other handholes 1 inch above finished grade.

5. Where indicated, cast handhole cover frame integrally with handhole structure.
C. Drainage: Install drains in bottom of manholes where indicated. Coordinate with drainage provisions indicated.

D. Waterproofing: Apply waterproofing to exterior surfaces of handholes after concrete has cured at least three days. Waterproofing materials and installation are specified in Section 071353 "Elastomeric Sheet Waterproofing." After duct has been connected and grouted, and before backfilling, waterproof joints and connections, and touch up abrasions and scars. Waterproof exterior of manhole chimneys after mortar has cured at least three days.

E. Hardware: Install removable hardware, including pulling eyes, cable stanchions, and cable arms, and insulators, as required for installation and support of cables and conductors and as indicated.

F. Field-Installed Bolting Anchors in Concrete Handholes: Do not drill deeper than 3-7/8 inches for manholes and 2 inches for handholes, for anchor bolts installed in the field. Use a minimum of two anchors for each cable stanchion.

3.7 GROUNDING

A. Ground underground ducts and utility structures according to Section 260526 "Grounding and Bonding for Electrical Systems."

3.8 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

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

B. Correct deficiencies and retest as specified above to demonstrate compliance.

C. Prepare test and inspection reports.
3.9 CLEANING

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

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

END OF SECTION 260543
SECTION 10 14 40
SIGNS
FABRICATED STAINLESS STEEL – LETTERS

PART 1 - GENERAL

1.1 SCOPE
   A. Furnish Letters/Logos and hardware necessary to install Fabricated Stainless Steel shown on drawings and herein specified.

1.2 SUBMITTALS
   A. Manufacturer’s illustrated product literature and specifications.
   B. Installation instructions

1.3 QUALITY ASSURANCE
   A. Manufacturer to have a minimum of 20 years experience in manufacturing letters.
   B. All letters to be manufactured by one manufacturer.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURER
   A. Gemini Incorporated
      103 Mensing Way
      Cannon Falls, MN 55009
      Phone: 800-538-8377 or 507-263-3957
      Fax: 800-421-1256 or 507-263-4887
      Email: sales@geminisignproducts.com
      Web: www.geminisignproducts.com
   B. Or equal

2.2 MATERIALS
   A. High-Grade, Pre-Finished Stainless Steel Alloy #304 & #316

2.3 GENERAL CONSTRUCTION
   A. Material Gauge: Fabricated letters up to 24” are produced with 18 gauge faces and 24 gauge returns; letters greater than 24” are produced with 16-18 gauges faces and 22 gauge returns.
   B. Cutting: Computer guided lasers cut letters, logos or shapes.
   C. Construction: Letter returns are cut to size based on the desired letter depth and bent to the contour of the laser cut faces to produce a hollow-backed letter with 90° angle edges. Inside joints are hand-soldered with a continuous bead of lead-free silver solder.
   D. Testing: Solder joints indicate the ability to withstand temperatures from -40°F to 220°F. Salt Fog tested to ASTM B-117-95 for corrosion resistance.
E. Finishes: All Fabricated Stainless Steel letters are laser cut from pre-finished Stainless Steel (finish options below).

F. Edges: The edges of all letter faces will have thin line of exposed silver stainless steel.

2.4 FINISH OPTIONS
A. 304 Stainless Steel
   1. Painted finish: primed then sprayed with 2-part hardened acrylic polyurethane paint, oven baked.

B. 316 Stainless Steel (more corrosion resistant—recommended for coastal installations)
   1. Painted finish, primed then sprayed with 2-part hardened acrylic polyurethane paint, oven baked.

2.5 FABRICATED TYPE OPTIONS
A. Fabricated with Cut-Out Faces (face or backlit optional LED package)
   1. Cut-Out Face with Insert, Backs, and Removable cans

2.6 BACK OPTIONS
A. Metal Backs
   1. Raw, unpainted or finished backs
   2. Removable or non-removable backs

2.7 MOUNTING OPTIONS
   1. Letters up to 6" high: 6-32 threaded studs. Over 6" up to 24": 10-24 threaded studs. Over 24": 1/4-20 threaded studs. All Stainless Steel Studs.
   2. Mounting locations determined by manufacturer, or per supplied art.
   3. Standard stud lengths available with or without spacers. Standard studs are threaded into stud bosses, from the backs of letters or letter returns with a Top or Bottom stud mount.
   4. Top and Bottom mounts over 8" high require tie-backs (not supplied) for letter support. Optional 1/8" thick back, allowing extra structural support – reduce need for tie-backs.
2.8 LIT FABRICATED WITH LEDS

A. Fabricated letters lit with 12-volt DC LEDs - optional lighting packages.
   1. Face lit letters with outline and acrylic inserts.
   2. Removable cans or detachable stud options for mounting lit letters and allowing future servicing of LEDs.
   3. UL Listed Sign Sections with Class 2 power supplies, lead wires/cables, wiring diagrams and installation instructions supplied.

2.9 Manufacturer

A. Letters to be made with pre-finished Alloy 304/316, Stainless Steel in multiple finish options.

B. Letters shall be Arial Bold Narrow letter style and shall be 32 inches and 24 inches high respectively and four (4) inches deep, as indicated on drawings.

C. Mounting shall be bottom stud mount and a mounting template designating stud hole locations is required for mounting on a stainless steel surface.

PART 3 - Execution

3.1 Installation

A. A qualified installer shall install fabricated letters. Additional structural support may be required for larger/heavier letters and logos.

3.2 Warranty

A. Letters should be guaranteed for the life of the business against defects.

3.3 Maintenance

A. Cleaning of Letters/Logos as needed, per manufacturer’s recommendations.

END OF SECTION
SECTION 084229.23 - SLIDING AUTOMATIC ENTRANCES

PART 1 - GENERAL

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

1.2 SUMMARY
A. Section includes exterior, sliding, power-operated automatic entrances.
B. Related Requirements:
   1. Section 033000 "Cast-in-Place Concrete" for installing recessed metal frames for control mats in concrete and forming recesses in concrete for recessed thresholds.

1.3 DEFINITIONS
A. AAADM: American Association of Automatic Door Manufacturers.
B. Activation Device: A control that, when actuated, sends an electrical signal to the door operator to open the door.
D. Safety Device: A control that, to avoid injury, prevents a door from opening or closing.
E. For automatic door terminology, refer to BHMA A156.10 for definitions of terms.

1.4 COORDINATION
A. Coordinate sizes and locations of recesses in concrete floors for recessed sliding tracks and recessed control mats that control automatic entrances. Concrete, reinforcement, and formwork requirements are specified elsewhere.
B. Templates: Distribute for doors, frames, and other work specified to be factory prepared for installing automatic entrances.
C. Coordinate hardware with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish. Coordinate hardware for automatic entrances with hardware required for rest of Project.
D. Electrical System Roughing-in: Coordinate layout and installation of automatic entrances with connections to power supplies and remote activation devices. System Integration: Integrate sliding automatic entrances with other systems as required for a complete working installation.

1. Provide electrical interface control capability for activation of sliding automatic entrances by security access system on doors with electric locking.
2. Provide electrical interface to deactivate door operators on activation of fire alarm system.
3. Provide electrical interface to allow for remote monitoring of automatic entrance door panel status.

1.5 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for automatic entrances.
   2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

B. Shop Drawings: For sliding automatic entrances.
   1. Include plans, elevations, sections, hardware mounting heights, and attachment details.
   2. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
   3. Include diagrams for power, signal, and control wiring.
   4. Indicate locations of activation and safety devices.
   5. Include hardware schedule and indicate hardware types, functions, quantities, and locations.

C. Samples for Initial Selection: For units with factory-applied color finishes.
   1. Include Samples of hardware and accessories involving color or finish selection.

D. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.

E. Delegated-Design Submittal: For automatic entrances.

1.7 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Manufacturer
B. Product Certificates: For each type of automatic entrance. Include emergency-exit features of automatic entrances serving as a required means of egress.

C. Product Test Reports: For each type of automatic entrance, for tests performed by a qualified testing agency.

D. Field quality-control reports.

E. Sample Warranties: For manufacturer's special warranties.

1.8 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For automatic entrances, safety devices, and control systems to include in operation and maintenance manuals.

1.9 QUALITY ASSURANCE

A. Manufacturer Qualifications: A manufacturer with Company Certificate issued by AAADM indicating that manufacturer has a Certified Inspector on staff.

B. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation and maintenance of units required for this Project and who employs a Certified Inspector.

1. Maintenance Proximity: Not more than two (2) hours’ normal travel time from Installer's place of business to Project site.

C. Certified Inspector Qualifications: Certified by AAADM.

1.10 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of automatic entrances that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

   a. Structural failures including, but not limited to, excessive deflection.
   b. Faulty operation of operators, controls, and hardware.
   c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.

2. Warranty Period: Two (2) years from date of Substantial Completion.

B. Special Finish Warranty: Manufacturer agrees to repair or replace components on which finishes fail in materials or workmanship within specified warranty period.

1. Deterioration includes, but is not limited to, the following:
a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.

b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.

c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

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

PART 2 - PRODUCTS

2.1 AUTOMATIC ENTRANCE ASSEMBLIES

A. Source Limitations: Obtain sliding automatic entrances from single source from single manufacturer.

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

C. Power-Operated Door Standard: BHMA A156.10.

2.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design automatic entrances.

B. Structural Performance: Automatic entrances shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to ASCE/SEI 7.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

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

D. Operating Temperature Range: Automatic entrances shall operate within minus 20 to plus 122 deg F.

E. Air Infiltration: Maximum air leakage through fixed glazing and framing areas of 1.25 cfm/sq. ft. of fixed entrance-system area when tested according to ASTM E 283 at a minimum static-air-pressure difference of 1.57 lbf/sq. ft. - 6.24 lbf/sq. ft.

F. Opening Force:

   1. Power-Operated Doors: Not more than 50 lbf (222 N) required to manually set door in motion if power fails, and not more than 15 lbf (67 N) required to open door to minimum required width.

   2. Breakaway Device for Power-Operated Doors: Not more than 50 lbf (222 N) required for a breakaway door or panel to open.

G. Entrapment-Prevention Force:
1. Power-Operated Sliding Doors: Not more than 30 lbf (133 N) required to prevent stopped door from closing.

2.3 SLIDING AUTOMATIC ENTRANCES

A. General: Provide manufacturer's standard automatic entrances, including doors, sidelites, framing, headers, carrier assemblies, roller tracks, door operators, controls, and accessories required for a complete installation.

B. Sliding Automatic Entrance:

1. Single-Sliding Units:

   a. Traffic Pattern: One way.
   b. Emergency Breakaway Capability: Sliding leaf only.
   c. Mounting: Between jambs.

3. Operator Features:
   a. Power opening and closing.
   b. Drive System: Chain.
   c. Adjustable opening and closing speeds.
   d. Adjustable hold-open time between zero and 30 seconds.
   e. Obstruction recycle.
   f. On-off/hold-open switch to control electric power to operator, key operated.

4. Sliding-Door Carrier Assemblies and Overhead Roller Tracks: Carrier assembly that allows vertical adjustment; consisting of nylon- or delrin-covered, ball-bearing-center steel wheels operating on a continuous roller track, or ball-bearing-center steel wheels operating on a nylon- or delrin-covered, continuous roller track. Support doors from carrier assembly by cantilever and pivot assembly.
   a. Rollers: Minimum of two ball-bearing roller wheels and two antirise rollers for each active leaf.

5. Sliding-Door Threshold: Threshold members and bottom-guide-track system with stainless-steel, ball-bearing-center roller wheels.
   a. Configuration: No threshold across door opening and recessed guide-track system at sidelites.

6. Controls: Activation and safety devices according to BHMA standards.
   a. Activation Device: Motion sensor mounted on each side of door header to detect pedestrians in activating zone and to open door.
   b. Safety Device: Two photoelectric beams mounted in sidelite jambs on each side of door to detect pedestrians in presence zone and to prevent door from closing.
c. Sidelite Safety Device: Presence sensor, mounted above each sidelite on side of door opening through which doors travel, to detect obstructions and to prevent door from opening.

d. Opening-Width Control: Two-position switch that in the normal position allows sliding doors to travel to full opening width and in the alternate position reduces opening to a selected partial opening width.

7. Finish: Finish framing, door(s), and header with finish matching adjacent storefront.

   a. Color: As selected by Architect from full range of industry colors and color densities.

2.4 ENTRANCE COMPONENTS

   A. Framing Members: Extruded aluminum, minimum 0.125 inch (3.2 mm) thick and reinforced as required to support imposed loads.

      1. Nominal Size: 1-3/4 by 4-1/2 inches (45 by 115 mm).
      2. Extruded Glazing Stops and Applied Trim: Minimum 0.062-inch (1.6-mm) wall thickness.

   B. Stile and Rail Doors: 1-3/4-inch- (45-mm-) thick, glazed doors with minimum 0.125-inch- (3.2-mm-) thick, extruded-aluminum tubular stile and rail members. Mechanically fasten corners with reinforcing brackets that are welded or incorporate concealed tie-rods that span full length of top and bottom rails.

      2. Stile Design: Thin stile, less than 1-3/4-inch (45-mm) nominal width.
      3. Rail Design: 5-inch (125-mm) nominal height.
      4. Muntin Bars: Horizontal tubular rail member for each door; match stile design and finish.

   C. Headers: Fabricated from minimum 0.125-inch- (3.2-mm-) thick extruded aluminum and extending full width of automatic entrance units to conceal door operators and controls. Provide hinged or removable access panels for service and adjustment of door operators and controls. Secure panels to prevent unauthorized access.

      1. Mounting: Surface mounted.
      2. Capacity: Capable of supporting doors of up to [175 lb (79 kg) per leaf over spans of up to 14 feet (4.3 m)] without intermediate supports.

         a. Provide sag rods for spans exceeding 14 feet (4.3 m).

   D. Brackets and Reinforcements: High-strength aluminum with nonstaining, nonferrous shims for aligning system components.

   E. Signage: As required by cited BHMA standard.

      2. Provide sign materials with instructions for field application after glazing is installed.
2.5 MATERIALS

A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.

B. Steel Reinforcement: Reinforcement with corrosion-resistant primer complying with SSPC-PS Guide No. 12.00 applied immediately after surface preparation and pretreatment. Use surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.

C. Stainless-Steel Tubing: ASTM A 554, Grade MT 316.

D. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, type 316, stretcher-leveled standard of flatness, in entrance manufacturer's standard thickness.

E. Polycarbonate Sheet: ASTM C 1349, Appendix X1, type II, coated, mar-resistant, UV-stabilized polycarbonate with coating on both surfaces.

F. Glazing: As specified in Section 088000 "Glazing."

G. Sealants and Joint Fillers: As specified in Section 079200 "Joint Sealants."

H. Nonmetallic, Shrinkage-Resistant Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout; complying with ASTM C 1107/C 1107M; of consistency suitable for application.

I. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

J. Fasteners and Accessories: Corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.

2.6 DOOR OPERATORS AND CONTROLS

A. General: Provide operators and controls, which include activation and safety devices, according to BHMA standards, for condition of exposure, and for long-term, maintenance-free operation under normal traffic load for type of occupancy indicated.

B. Door Operators: Provide door operators of size recommended by manufacturer for door size, weight, and movement.
   1. Door Operator Performance: Door operators shall open and close doors and maintain them in fully closed position when subjected to Project's design wind loads.
   2. Electromechanical Operators: Concealed, self-contained, overhead units powered by fractional-horsepower, permanent-magnet dc motor; with closing speed controlled mechanically by gear train and dynamically by braking action of electric motor; with solid-state microprocessor controller; complying with UL 325; and with manual operation with power off.
C. Presence Sensors: Self-contained, active-infrared scanner units; adjustable to provide detection-field sizes and functions required by BHMA A156.10. Sensors shall remain active at all times.

D. Electrical Interlocks: Unless units are equipped with self-protecting devices or circuits, provide electrical interlocks to prevent activation of operator when door is locked, latched, or bolted.

2.7 HARDWARE

A. General: Provide units in sizes and types recommended by automatic entrance and hardware manufacturers for entrances and uses indicated. Finish exposed parts to match door finish unless otherwise indicated.

B. Breakaway Device for Power-Operated Doors: Device that allows door to swing out in direction of egress to full 90 degrees from any operating position. Maximum force to open door shall be as stipulated in "Performance Requirements" Article. Interrupt powered operation of door operator while in breakaway mode.

1. Include one adjustable detent device mounted at the top of each breakaway panel to control breakaway force.
   b. Limit Arms: Limit swing to 90 degrees, spring loaded with adjustable friction damping.

C. Weather Stripping: Replaceable components.

1. Sliding Type: AAMA 701/702, made of wool, polypropylene, or nylon woven pile with nylon-fabric or aluminum-strip backing.

2.8 ACCESSORIES

A. Guide Rails: Stainless steel, fabricated from tubing, minimum 30 inches (762 mm) high, and finished to match doors unless otherwise indicated; positioned and projecting from face of door jamb for distance as indicated, but not less than that required by BHMA A156.10 for type of door and direction of travel; with filler panel.


2. Mounting: Jamb and floor.


2.9 FABRICATION

A. General: Factory fabricate automatic entrance components to designs, sizes, and thicknesses indicated and to comply with indicated standards.

1. Form aluminum shapes before finishing.
2. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

3. Use concealed fasteners to greatest extent possible. Where exposed fasteners are required, use countersunk Phillips flat-head machine screws, fabricated from stainless steel.
   a. Where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration, use self-locking devices.
   b. Reinforce members as required to receive fastener threads.

4. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.

B. Framing: Provide automatic entrances as prefabricated assemblies. Complete fabrication, assembly, finishing, hardware application, and other work before shipment to Project site.

1. Fabricate tubular and channel frame assemblies with welded or mechanical joints. Provide subframes and reinforcement as required for a complete system to support required loads.
2. Perform fabrication operations in manner that prevents damage to exposed finish surfaces.
3. Form profiles that are sharp, straight, and free of defects or deformations.
4. Provide components with concealed fasteners and anchor and connection devices.
5. Fabricate components with accurately fitted joints, with ends coped or mitered to produce hairline joints free of burrs and distortion.
6. Fabricate exterior components to drain water passing joints, condensation occurring within framing members, and moisture migrating within system to exterior. Provide anchorage and alignment brackets for concealed support of assembly from building structure.
7. Allow for thermal expansion of exterior units.

C. Doors: Factory fabricated and assembled in profiles indicated. Reinforce as required to support imposed loads and for installing hardware.

D. Metal Cladding: Factory-fabricated and -installed metal cladding, completely covering all visible surfaces as part of prefabricated entrance assembly before shipment to Project site.

1. Perform fabrication operations in manner that prevents damage to exposed finish surfaces.
2. Form profiles that are sharp, straight, and free of defects or deformations.
3. Provide components with concealed fasteners and anchor and connection devices.
4. Fabricate components with accurately fitted joints, with ends coped or mitered to produce hairline joints free of burrs and distortion.
5. Fabricate exterior components to drain water passing joints, condensation occurring within framing members, and moisture migrating within system to exterior. Allow for thermal expansion at exterior entrances.

E. Door Operators: Factory fabricated and installed in headers, including adjusting and testing.
F. Glazing: Fabricate framing with minimum glazing edge clearances for thickness and type of glazing indicated, according to GANA's "Glazing Manual."

G. Hardware: Factory install hardware to greatest extent possible; remove only as required for final finishing operation and for delivery to and installation at Project site. Cut, drill, and tap for factory-installed hardware before applying finishes.

1. Provide sliding-type weather stripping, mortised into door, at perimeter of doors.

H. Controls:

1. General: Factory install activation and safety devices in doors and headers as required by BHMA A156.10 for type of door and direction of travel.

2. Install photoelectric beams in vertical jambs of sidelites, with dimension above finished floor as follows:
   a. Top Beam: 48 inches (1219 mm)
   b. Bottom Beam: 24 inches (610 mm)

2.10 GENERAL FINISH REQUIREMENTS

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Apply organic and anodic finishes to formed metal after fabrication unless otherwise indicated.

C. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.11 ALUMINUM FINISHES

A. Color Anodic Finish: AAMA 611, AA-M12C22A32/A34, Class II, 0.010 mm or thicker.

B. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils (0.04 mm). Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

1. Color and Gloss: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances, header support, and other conditions affecting performance of automatic entrances.
B. Examine roughing-in for electrical systems to verify actual locations of power connections before automatic entrance installation.

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

3.2 INSTALLATION

A. General: Install automatic entrances according to manufacturer's written instructions and cited BHMA A156.10 for direction of pedestrian travel, including signage, controls, wiring, and connection to the building's power supply.

1. Do not install damaged components. Fit frame joints to produce hairline joints free of burrs and distortion. Rigidly secure nonmovement joints. Seal joints watertight.
2. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
3. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous coating.

B. Entrances: Install automatic entrances plumb and true in alignment with established lines and grades without warp or rack of framing members and doors. Anchor securely in place.

1. Install surface-mounted hardware using concealed fasteners to greatest extent possible.
2. Set headers, carrier assemblies, tracks, operating brackets, and guides level and true to location with anchorage for permanent support.
3. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within system to exterior.
4. Level recesses for recessed thresholds using nonshrink grout.

C. Door Operators: Connect door operators to electrical power distribution system.

D. Controls: Install and adjust activation and safety devices according to manufacturer's written instructions and cited BHMA standard for direction of pedestrian travel. Connect control wiring according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

E. Guide Rails: Install rails according to BHMA A156.10, including Appendix A, and manufacturer's written instructions unless otherwise indicated.

F. Glazing: Install glazing as specified in Section 088000 "Glazing." Sealants: Comply with requirements specified in Section 079200 "Joint Sealants" to provide weathertight installation.

1. Set thresholds, bottom-guide-track system, framing members and flashings in full sealant bed.
2. Seal perimeter of framing members with sealant.

G. Wiring within Automatic Entrance Enclosures: Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's written limitations on bending radii. Provide and use lacing bars and distribution spools.
3.3 FIELD QUALITY CONTROL

A. Certified Inspector: Engage a Certified Inspector to test and inspect components, assemblies, and installations, including connections.

B. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
   1. Test and inspect each automatic entrance, using AAADM inspection forms, to determine compliance of installed systems with applicable BHMA standards.

C. Automatic entrances will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports.

3.4 ADJUSTING

A. Adjust hardware, moving parts, door operators, and controls to function smoothly, and lubricate as recommended by manufacturer; comply with requirements of applicable BHMA standards.
   1. Adjust exterior doors for tight closure.

B. Readjust door operators and controls after repeated operation of completed installation equivalent to three days’ use by normal traffic (100 to 300 cycles).

C. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two 2 visits to Project during other-than-normal occupancy hours for this purpose.

3.5 CLEANING

A. Clean glass and metal surfaces promptly after installation. Remove excess glazing and sealant compounds, dirt, and other substances. Repair damaged finish to match original finish.
   1. Comply with requirements in Section 088000 "Glazing" for cleaning and maintaining glass.

3.6 MAINTENANCE SERVICE

A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 12 months' full maintenance by skilled employees of automatic entrance installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper automatic entrance operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
   1. Engage a Certified Inspector to perform safety inspection after each adjustment or repair and at end of maintenance period. Furnish completed inspection reports to Owner.
2. Perform maintenance, including emergency callback service, during normal working hours.
3. Include 24-hour-per-day, 7-day-per-week emergency callback service.

3.7 DEMONSTRATION

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

END OF SECTION 084229