SECTION [32 39 13]
MANUFACTURED METAL BOLLARDS

PART 1 GENERAL

1.1 SUMMARY

A. Walk, Road and Parking Appurtenances include the following:
1. Metal Bollards
2. Flexible Bollards
3. Mounting Hardware
4. Crash barriers
5. Delineators

B. RELATED SECTIONS
1. Section 03 30 00 – Cast-in-Place Concrete
2. Section 03 38 00 – Post-Tensioned Concrete
3. Section 10 26 00 – Wall and Corner Guards
4. Section 11 12 00 – Parking Control Equipment
5. Section 11 13 13 – Loading Dock Bumpers
6. Section 34 41 16 – Traffic Control Equipment

1.2 REFERENCE STANDARDS

A. ASTM International (ASTM):
1. ASTM A 36 - Standard Specification for Carbon Structural Steel.
2. ASTM A 53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
3. ASTM A 312 - Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes.
4. ASTM A 536 - Standard Specification for Ductile Iron Castings.
5. ASTM D 1654 - Standard Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments.

B. International Standards Organization (ISO): Test Method UNE-EN-ISO 11925-2.

C. Society for Protective Coatings (SSPC) Quality Standards: Q195 SSPC, Q235 SSPC and Q235 SSPC.

1.3 SUBMITTALS

A. Comply with Section [01 33 00 – Submittal Procedures.]

B. 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. Installation methods.
4. Cleaning and maintenance instructions.

C. Shop Drawings: Show mounted items and coordination required for work specified in other Sections; indicate construction and installation details.

D. Verification Samples: One sample for each product specified, representing colors and finishes to be installed.

E. Maintenance Information: Submit manufacturer's touch-up, cleaning, and maintenance information.

F. Warranty Documentation: Submit manufacturer's warranty documentation.

1.4 QUALITY ASSURANCE

A. Comply with Section [01 43 00 – Quality Assurance.]

1.5 DELIVERY, STORAGE AND HANDLING

A. Comply with Section [01 66 00 – Product Storage and Handling Requirements.]

B. Protect bollards and accessories during delivery, storage, and handling.

1.6 WARRANTY

A. Comply with Section [01 78 36 – Warranties.]

B. Manufacturer's Warranty: Provide manufacturer's standard warranty that metal and rubber components will be free from defects in material and workmanship for one year. Provide manufacturer's standard warranty that coatings will not peel, crack or significantly change color for two years.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: SlowStop Bollards (Impact Recovery Systems), 4955 Stout Dr., San Antonio, TX 78219; Toll Free Tel: 800-736-5256; Tel: 210-736-4477 ; Fax: 210-734-6448; Email: mailto:info@impactrecovery.com; Web: www.slowstop.com ; www.impactrecovery.com

B. Substitutions: To be considered in accordance with provisions of [Section 01 25 00.][Not Permitted.]

2.2 METAL BOLLARDS

A. Metal Bollards: Metal bollards and mounting hardware as manufactured by SlowStop Bollards, model as listed below.
   1. Materials:
      a. Ductile Cast Iron: ASTM A536, Grade 60/40/18
      b. Steel: ASTM A36
      c. Elastomer: Natural Rubber ASTM D2240 Shore A 60 (± 5).
   2. Mounting System: Surface (flange), bollard attached to the surface by mechanical anchoring.
   3. Installation Hardware
      a. Installation: Provide galvanized carbon steel 5/8” concrete screw anchor bolts and other types of hardware as recommended by manufacturer for substrates and installation condition.
      b. Provide hardware for standard permanently fixed installation.
      c. Provide hardware for movable installation.
   3. Working Temperature: -40 degrees F / + 140 degrees F (-40 degrees C / + 60 degrees C).
   4. Rebounding Bollards:
      a. Post: Steel pipe, size as indicated on Drawings.
      b. Post: Galvanized steel pipe, size as indicated on Drawings.
      c. Post: Stainless Steel pipe, size as indicated on Drawings.
      d. Footing: 3000 psi minimum concrete.
      e. Footing: Concrete as specified in Division 3.
   5. Upright Finish:
      a. Type: Polyester powder coat finish utilizing an epoxy prime coat and a polyester top coat.
      b. Performance: 1000 hours salt-spray resistance as per ASTM D 1654.
      c. Color: Safety Yellow RAL 1023
      d. Color: Custom color, _____.
      e. Color: Custom color as selected by Architect.
      f. Color: As indicated on Drawings.
   6. Base Finish:
      a. Type: Environmental Friendly KTL Finish with UV Gloss
      b. Performance: 1000 hours salt-spray resistance as per ASTM D 1654.
      c. Color: Black
      d. Color: Custom color, _____.
      e. Color: Custom color as selected by Architect.
      f. Color: As indicated on Drawings.
   7. Kinetic energy resistance testing by accredited laboratory.

B. Metal Bollards: SlowStop Bollards Type 1 (Model slowstopk1).
   1. Size: 42 inches (1066 mm) high x 3 inches (76 mm) diameter.
   2. Design: Cylindrical.
   3. Energy Absorption: 1,621 joules / 1,195 ft-lb.
   4. Material: Steel Post and Ductile Cast Iron Base.

C. Metal Bollards: SlowStop Bollards Type 2 (Model slowstopk2).
   1. Size: 42 inches (1066 mm) high x 4 inches (100 mm) diameter.
   2. Design: Cylindrical.
   3. Energy Absorption: 2,667 joules / 1,967 ft-lb.
   4. Material: Steel Post and Ductile Cast Iron Base

D. Metal Bollards: SlowStop Bollards Type 3 (Model slowstopk3).
   1. Size: 42 inches (1066 mm) high x 6.63 inches (168 mm) diameter.
   2. Design: Cylindrical.
   3. Energy Absorption: 12,934 joules / 9,536 ft-lb.
   4. Material: Steel Post and Ductile Cast Iron Base

E. Metal Bollard Sign Post: SlowStop Handicap Parking Bollards Type 2 (Model sshandicap2).
   1. Overall Size: 78 inches (1981 mm) high.
   2. Bollard Size: 42 inches (1066 mm) high x 4 inches (100 mm) diameter.
   3. Sign Size: 18 inches (457mm) x 12 inches (305 mm) diameter.
   4. Sign Height: 60 inches (1524mm) from ground.
   5. Energy Absorption: 1,621 joules / 1,195 ft-lb.
   6. Material: Ductile iron casting.
   7. Material: Steel Bollard Post, Ductile Cast Iron Base, Aluminum Signpost, HDPE ADA Parking Sign.

F. Metal Bollards: SlowStop Bollards Type 1 (Model horseshoek2).
   1. Size: 28 inches (711 mm) high x 36 inches (914 mm) wide.
   2. Pipe Size: 4 inches (100 mm) diameter.
   3. Design: U-Shaped (horseshoe)
   4. Energy Absorption: 5,334 joules / 3,934ft-lb.
   5. Material: Steel Post and Ductile Cast Iron Base and Elbows.

PART 3 EXECUTION

3.1 PREPARATION

A. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions for placement.

B. Do not proceed with installation until substrates have been properly prepared and deviations from manufacturer's recommended tolerances for placement and location of embedded items and condition of substrate are corrected.

C. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions. Commencement of installation constitutes acceptance of conditions.

3.2 INSTALLATION

A. Install in accordance with manufacturer's written instructions and recommendations.
   1. Installation Method: Cast-in-place surface mount screw anchor method.
   2. Installation Method: Cast-in-place surface mount threaded rod method.

B. Damaged, cracked, chipped, deformed or marred products are not acceptable. Field touch-up minor imperfections in accordance with manufacturer's instructions.

C. Application Substrates: Concrete, thin slabs on concrete.
   1. Anchoring Type: Surface attached.

D. Application Substrate: Soil, asphalt, poor cement, thick slabs, brick pavers as applicable.
   1. Anchoring Type: Concrete footings per manufacturer’s recommendations.

E. Bollard Sign Posts: Fill cores of bollards with concrete and embed sign post. Strike concrete level with top of steel bollard or dome approximately 2” above.

3.3 CLEANING AND PROTECTION

A. Cleaning: Immediately prior to Substantial Completion, clean bollards in accordance with manufacturer's instructions to remove dust, dirt, adhesives, and other foreign materials.

B. Protection: Protect installed work from damage.

3.4 CLOSEOUT ACTIVITIES

A. Provide Warranty

END OF SECTION