

SECTION 02815

Glass Fiber Reinforced Concrete Bollards

STROMBERG

Architectural Products Inc.

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Glass fiber reinforced concrete (GFRC) bollards as indicated on the drawings.

1.2 RELATED SECTIONS

- A. Division 04 Section "Cast Stone".
- B. Division 05 Section "Metal Fabrications" for supplementary supports for large items.
- C. Division 06 Section "Rough Carpentry" for supplementary supports for large items.
- D. Division 06 Section "Glass Fiber Reinforced Plastic Fabrications".
- E. Division 09 Section "Glass Fiber Reinforced Gypsum Fabrications".
- F. Division 09 Section "Paints and Coatings" for field painting and sealing prior to painting.

1.3 REFERENCES

- A. ASTM C 150 - Standard Specification for Portland Cement; 1999a.
- B. ASTM C 33-99 Concrete Aggregates
- C. ASTM C 666 – Standard test Method for Resistance of Concrete to Rapid Freezing and Thawing
- D. ASTM C 979-82(1993): Pigments for Integrally colored Concrete.
- E. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 1999.
- F. ASTM G 23 - Standard Practice for Operating Light-Exposure Apparatus (Carbon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials; 1996.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including dimensions, finishes, storage and handling requirements and recommendations, and installation recommendations.

- C. Shop Drawings: For custom items, provide drawings showing dimensions, layout, joints, details, and interface with adjacent work; include field measured dimensions of the spaces where items are to be installed, if critical to proper installation.
- D. Samples: For each custom finish specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

1.5 QUALITY ASSURANCE

- A. Manufacturer: Obtain GFRC bollards as manufactured by a firm specializing in the manufacture of GFRC bollards, with a minimum of ten years experience.
- B. Provide a list of projects comparable in size, scope, and complexity as indicated.
- C. Provide verification that glass fiber reinforced concrete bollards meets or exceeds products specified.
- D. Installer Qualifications: Regularly engaged and experienced in the installation of glass fiber reinforced concrete products.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Transport, lift, and handle units with care, avoiding excessive stress and preventing damage; use appropriate equipment.
- B. Store products in manufacturer's unopened packaging until ready for installation, in a clean dry area protected from weather, moisture and damage; store units upright and not stacked unless permitted by manufacturer. Product shall be stored clear of the ground on non-staining pallets or other temporary planking.
- C. Protect product from staining, chipping, and other damage.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Stromberg Architectural Products Inc; PO Box 8036, I-30 West, 4400 Oneal, Greenville, TX 75404. ASD. Tel: (903) 454-0904. Fax: (903) 454-3642. Email: sales@strombergarchitectural.com. www.strombergarchitectural.com.
- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 MATERIALS

- A. Glass Fiber Reinforced Concrete Bollards: High density concrete made of ASTM C 150 Portland cement, crushed stone, silica sand, and polymers reinforced with glass fiber and structural reinforcing as required; asbestos free.
 - 1. Color: As selected from manufacturer's selection.

2. Color: To match Architect's sample.
3. Surface Texture: Exposed surface as selected from manufacturer's selection
4. Overall Height: _____ft. _____in.
5. Bollard Plan Shape: (Select One) [square] [round] [as indicated on drawings] [as selected by Architect].
6. Bollard Dimensions: (Select "a", "b", or "c" below)
 - a. [_____]ft. [_____]in. Radius]
 - b. [_____]ft. [_____]in. Square]
 - c. [Per drawings]
7. Internal light: (Select One) [N/A] [lighted per Electrical documents]
8. Density: 140 pcf (2240 kg/cu m).
9. Shell Thickness: 3/8" to 3/4 inch (9.5 mm), nominal.
10. Surface Burning Characteristics: Flame spread index of 0, smoke developed index of 5; when tested in accordance with ASTM E 84. Fuel contribution of 3.
11. Weather Resistance: No significant loss in strength or change in appearance after 200 hours accelerated weathering conducted in accordance with ASTM G 23.
12. Flexural Strength: 1000 to 1800 psi (6.9 to 12.4 MPa).
13. Modulus of Elasticity: 2×10^5 psi (1370 MPa).
14. Compressive Strength: Over 5000 psi (34 MPa).
15. Variation from Dimensions Indicated on Drawings: Plus and minus 1/8 inch (3 mm), maximum.
16. Variation from Plane Along Edge or Surface: Plus and minus 1/16 inch per linear foot (1.5 mm in 300 mm), maximum.
17. Outside Corner Radius: 1/16 inch to 1/8 inch (1.5 to 3 mm).
18. Draft Angle: 3 degrees, minimum, on returns, setbacks, reveals, and grooves.
19. Provide non-corrosive anchors and reinforced anchoring points as indicated on drawings.

a. Concealed Anchors: Hot-dipped Galvanized Steel unless otherwise indicated.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly constructed; verify that substrates are plumb and true.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
 1. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Check field dimensions before beginning installation. If dimensions vary too much from design dimensions for proper installation, notify Architect and wait for instructions before beginning installation.
- E. Verify that bearing surface is plumb and true.
- F. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.

- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Install supplementary temporary and permanent supports as required for proper installation.

3.3 INSTALLATION

- A. Install in accordance with applicable code and manufacturer's recommendations, plumb and true to line; shim where necessary.
- C. Patch exposed anchor points to match color and texture of unit.
- D. Clean GFRC units according to manufacturer's written instructions.
 - 1. Remove dirt, stains, or other residue.
 - 2. Protect surrounding materials and surfaces during cleaning.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION