ITEM 607.25010011 – LIGHTWEIGHT ENVIRONMENTAL SHIELD, STRUCTURE-MOUNTED

DESCRIPTION
This work shall consist of designing, furnishing and installing a lightweight environmental shield system on an existing structure in accordance with the contract documents and as directed by the Engineer.

MATERIALS
A. Structural Steel

Steel shall meet the requirements of the New York State Steel Construction Manual with shop applied paint in accordance with Section 572 of the NYSDOT Standard Specifications and following subsections of Section 700 – Materials:

<table>
<thead>
<tr>
<th>Material</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural Steel</td>
<td>715-01</td>
</tr>
<tr>
<td>High Strength Bolts, Nuts and Washers</td>
<td>715-14</td>
</tr>
<tr>
<td>Shop-Applied Paint</td>
<td>708-01</td>
</tr>
</tbody>
</table>

Certified copies of test results conducted by the manufacturer shall be furnished to the Engineer in accordance with the requirements of 715-01, Structural Steel.

B. Lightweight Environmental Shield

Provide a composite system consisting of an internal steel core with expanded polystyrene insulation on either side, encapsulated with a fiberglass reinforcing mesh and finish. Provide an internal passive restraint system to prevent panels from falling onto the roadway below in the event of collision.

Panels and steel posts shall be fabricated to conform to the shapes, sizes, textures, and colors shown in the contract documents. The processing, approval, and transmittal of working drawings and 24 by 24 by 4 inch test panels shall be in accordance with procedural directives of the Materials Bureau.


Use a minimum wind design load of 37 pounds per square foot and a minimum ice load of 3 pounds per square foot to design the lightweight environmental shield components.

Provide provisions to allow for movement of the lightweight environmental shield panels at locations of bridge deck expansion joints.

Limit the total weight of the lightweight environmental shield system, including posts, to no greater than 260 pounds per linear foot.
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Design the system to contain fragments larger than 576 square inches in the event that the panel is broken and to prevent lightweight environmental shield components from falling on the roadway below.

The environmental shield panels shall be tested as follows and the results shall be provided to the Engineer.

<table>
<thead>
<tr>
<th>TEST</th>
<th>STANDARD</th>
<th>CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transverse Wind Load</td>
<td>ASTM E 330</td>
<td>Structural Performance by Uniform Static Air Pressure Difference</td>
</tr>
<tr>
<td>Transverse Load Test</td>
<td>ASTM E 72</td>
<td>Strength Tests of Panels for Building Construction</td>
</tr>
<tr>
<td>Accelerated Weathering</td>
<td>ASTM G 155</td>
<td>No deleterious effects after 2000 hours</td>
</tr>
<tr>
<td>Salt Spray Resistance</td>
<td>ASTM B 117</td>
<td>No deleterious effects after 300 hours</td>
</tr>
<tr>
<td>Surface Burning Characteristics</td>
<td>ASTM E 84</td>
<td>Flame Spread ≤ 25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Smoke Development ≤ 450</td>
</tr>
</tbody>
</table>

Any deviation must be approved by the Engineer prior to commencement of any work.

C. Integral Color, Coating, Anti-Graffiti Coating

1) All exposed shield surfaces shall receive a shop-applied 100% factory mixed acrylic coating with integral color and texture to match the color and texture of the existing wall in the project vicinity. The exact color to be utilized will be determined based on the preparation, examination, and approval for the 24 by 24 by 4-inch test panel. Provide a finish coat color on the proposed structural steel components that matches the color of the environmental shield panels.

2) All exposed shield surfaces shall receive a shop-applied anti-graffiti primer composed of a single component, waterborne aliphatic urethane coating.

3) All exposed shield surfaces shall receive a field-applied anti-graffiti coating composed of a two-component, liquid aliphatic urethane that cures to a very tough protective coating, as approved by the Engineer.
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D. Backer Rod and Joint Sealer

The elastomeric sealant shall be polysulfide or polyurethane conforming to the requirements of Subsection 705-06 of the NYSDOT Standard Specifications.

The backer rod shall be polyethylene foam, conforming to ASTM D3204, Type I.

All other materials specified in the Contractor’s lightweight environmental shield design shall be in accordance to the appropriate sections of the NYSDOT Standard Specifications.

**CONSTRUCTION DETAILS**

Layout posts and install anchorage holes in the outside face of the parapet in accordance with Section 586 of the NYSDOT Standard Specifications.

Fabricate and set steel posts plumb and in accordance with Section 564 of the NYSDOT Standard Specifications.

Protect the bottom edge of panels as they are “stood up”. Place shipping foam insulation under the panels for protection. Lift panels with care using proper equipment and techniques so that no damage occurs. Do not strain, distort or subject panels to impact loads; lower panels into place between posts according to the approved working drawings.

Once panels are in place, attach the passive restraint system and secure panels to the posts according to the approved working drawings.

Apply any remaining coatings and sealants required according to the approved working drawings ensuring no passage of light.

**METHOD OF MEASUREMENT**

This work will be measured for payment as the number of square feet of lightweight environmental shield, structure-mounted satisfactorily furnished and installed. The number of square feet will be computed as the number of square feet of environmental shield panel surface as measured from the outside face, only one face of panel will be measured.

**BASIS OF PAYMENT**

The unit price bid for Lightweight Environmental Shield, Structure-Mounted shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily complete the work including fabrication and installation of all structural steel including posts and fasteners, and all coatings.

Drilling and Grouting Bolts will be paid for separately.