ITEM 607.9200 09 - ACRYLITE SOUNDDSTOP TL-4 NOISE BARRIER SYSTEM

DESCRIPTION
This work shall consist of furnishing and installing an Acrylite Soundstop TL-4 noise barrier system as indicated in the contract documents and as directed by the Engineer.

The Acrylite Soundstop TL-4 noise barrier system consists of:
- ACRYLITE® Soundstop GS CC transparent, acrylic noise barrier panels,
- Structural steel frame, including:
  o steel support posts,
  o crash rails and
  o miscellaneous structural steel and hardware.
- Single Slope Concrete Half-Section Barrier

The following work items are not included in the cost of this payment item:

- Single Slope Concrete Half-Section Barrier

Refer to the contract documents for additional information, including payment items associated with related work tasks.

MATERIALS
The following sections of the standard specifications shall apply:

Galvanized Coatings and Repair Methods 719-01

The following ASTM specifications shall apply:

Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements E 90

The following standards shall also apply:

NYSDOT LRFD Bridge Design Specifications
Recommended Procedures for the Safety Performance Evaluation of Highway Features
AASHTO LRFD NCHRP Report 350

The design of the Acrylite® Soundstop TL-4 Noise Barrier System shall:
- conform to the NYSDOT LRFD Bridge Design Specifications, latest edition,
- meet Test Level 4 criteria specified in NCHRP Report 350,
- provide Sound Transmission Class > 27 as defined in ASTM E90/E413, and
- comply with this specification.

The Acrylite Soundstop TL-4 noise barrier system shall be supplied by:
Shatter Resistance: The transparent acrylic panel shall be required to retain all broken pieces by employing either an internal and/or external restraint system. The Contractor shall certify that the panel will retain all broken pieces after ten or more years of outdoor exposure.

Wind Load Resistance and Panel Thickness:
Panel thickness shall be determined based on the:
- design wind loads specified in the contract documents,
- panel size, and
- fixture methods employed for the project.

The maximum elastic deflection of the transparent acrylic noise barrier panel, under the design wind load shall be less than 3 in (76 mm). When a load factor of 1.5 is applied to the design wind load:
- The panel shall not show any symptoms of failure such as buckling or cracks.
- The sheet shall not become detached from its supports or fittings.

Graffiti Resistance: The Contractor shall recommend an effective, compatible graffiti remover and upon request furnish a product sample and provide a graffiti removal demonstration.

Bird Deterrence: A bird deterrence feature shall be included on all panels. The panels shall have a pattern capable of minimizing bird impacts. The bird deterring pattern shall be an integral part of the panel, capable of withstanding graffiti removal efforts. Application of films in a secondary, post production process, are not allowed.

Color: Transparent, acrylic noise barrier panels shall be clear (colorless) with embedded black filaments for shatter resistance and bird deterrence.

Structural Steel Frame:
All structural steel used in the Acrylite Soundstop TL-4 noise barrier system shall be galvanized according to §719-01.

Impact Resistance: The installed System shall be capable of sustaining one collision up to the level specified in NCHRP 350, Test Level 4 without being separated from the bridge barrier or structure to which it has been properly attached under this specification.
The noise barrier panels shall be secured to the overall noise barrier system in such a way that fragments do not fall when they are deformed or broken. The restraint systems shall be designed to withstand the self-weight of the relevant parts multiplied by a minimum safety factor of 4.

**Certification of Crash Worthiness:** The vendor shall provide a letter from a certified crash test facility indicating a physical crash test was conducted on the system and indicating acceptance by the Federal Highway Administration (FHWA).

**Expansion Allowance:** Provisions for expansion shall be placed within the noise barrier system to allow for expansion of the noise barrier panels and shall also be placed in the noise barrier at locations of bridge deck expansion joints and/or expansion joints in the concrete barrier.

**End Transitions:** The leading and trailing edge of the noise barrier shall incorporate sloped crash-rails to mitigate the severity of the impact of an errant vehicle. When the noise barrier is installed on a travelled way with a center median then only the leading edge of the noise barrier shall incorporate this sloped transition section.

**Certifications:**
The Contractor shall certify that the Acrylite Soundstop TL-4 Noise Barrier System conforms to the NYSDOT LRFD Bridge Design Specifications, latest edition, meets NCHRP Report 350 Test Level 4 criteria and meets the Sound Loss Criteria > 27 as defined in ASTM E90.

**CONSTRUCTION DETAILS**
Handle and install the Acrylite Soundstop TL-4 noise barrier system in accordance with the working drawings, construction documents, and manufacturer’s instructions. Use manufacturers suggested material and techniques to provide a continuous seal between the noise barrier panels and the support framing.

**Shop Drawings:**
The Contractor shall submit shop drawings, including design calculations, in accordance with the requirements of Section 2 in the New York State Steel Construction Manual. Shop drawings for the noise barrier system shall include:

- all the information required for the proper construction of the noise barrier system at each location,
- the complete details, information, and drawings of the system and anchorage components,
- the method, materials, design parameters, equipment, and procedures for installation to be followed.
- Submit structural calculations showing the barrier system meets the design wind loads specified in the contract documents and conforms to the accepted crash test criteria.

The shop drawings and calculations shall be prepared, stamped, and signed by a licensed and registered New York State Professional Engineer.
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Structural Steel Frame:
All structural steel work, including, but not limited to fabrication, inspection, transportation, and erection shall be done in accordance with the provisions of the current New York State Steel Construction Manual.

Anchor bolts attaching the noise barrier system to the concrete barrier shall be cast in place in the concrete barrier.

The posts shall be erected vertical and the rails shall be parallel to the top of the concrete barrier.

The Contractor shall arrange for a manufacturer’s field service representative to be on site for the initial post setting and panel installation.

METHOD OF MEASUREMENT
The work will be measured as the number of square meters of Acrylite Soundstop TL-4 noise barrier system furnished and installed.

The square meter area will be measured as the area of the noise barrier projected on a vertical plane between the top of the Acrylite Soundstop TL-4 noise barrier system and the top of the concrete barrier. Square meter area measurement at the tapered end sections shall be from the top of the transition rail to the top of the concrete barrier. Only one side of the noise barrier will be measured for payment.

BASIS OF PAYMENT
The unit price bid per square meter of Acrylite Soundstop TL-4 noise barrier system shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily complete the work.