

ITEM 607.9962 10 - NOISE BARRIER SYSTEM (HIGHWAYS)

DESCRIPTION

This work shall consist of designing, furnishing and erecting noise barriers as detailed and at the locations shown on the Plans or as directed by the Engineer.

All noise barriers shall consist of posts, panels, foundations, and all other associated members and attachments necessary to fabricate and erect sound abatement structures.

Post spacing for panel systems shall be as specified on the plans.

MATERIALS

The noise barrier shall meet the material requirements of §704-03 Precast Concrete - General or §718-01 Prestressed Concrete Units (Structural) with the following modifications and additions:

A. Concrete for Noise Barrier Posts, Panels and Footings

1. Concrete for precast noise barrier panels and columns shall have a minimum compressive strength of 35 MPa at 28 days after casting. Concrete for panels and columns shall have an integral color pigment.
2. Concrete for cast in place footings shall be Class HP concrete conforming to the requirements of Section 501.
3. When a prestressed concrete barrier system is chosen, all precast units shall meet the requirements of the New York State Prestressed Concrete Construction Manual (P.C.C.M.). Also, the Contractor shall notify the Deputy Chief Engineer Structures (D.C.E.S.) of the source of prestressed units for approval within (7) days after the award of the contract.

B. Structural Steel

Steel shall meet the requirements of Subsections 709-04 and 715-01 or 563-2.02 and 709-06.

1. When base plates are used, they shall be fabricated from ASTM A572 steel and galvanized per §719-01, Type II.
2. When anchor bolts are used, they shall be hot-dipped galvanized ASTM A449 conforming to §723-60. Nuts shall be galvanized steel heavy hex nuts meeting the requirements of ASTM A194, Grade 2H.
3. Nuts attached to threaded rebars shall be carbon steel heavy hex nuts meeting the requirements of ASTM A194, Grade 2H. These nuts and all exposed rebars shall be coated, after assembly, with a galvanized repair material appearing on the Department's Approved List.

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4. When threaded reinforcing is used as part of the design, the threads shall meet the requirements of ANSI B1.1
5. All exposed steel to be shop painted with three coats to match in color concrete panels in accordance with the Special Note on Preparation and Painting of Steel Surfaces.

C. Integral Color and Anti-Graffiti Coating

1. Integral Color

The precast concrete shall be integrally colored using a pigment coloring system meeting the requirements of ASTM C979. Pigment for integrally coloring concrete shall be a chemically pure material pigment, manufactured by a company with proven color mixes capable of producing approved custom colors complying with all environmental codes and ordinances and as approved by the Engineer. The admixture color shall produce a color conforming to the Federal Standard 595B. The color shall be as indicated on the Plans.

2. Anti-Graffiti Coating

Exposed concrete surfaces shall receive an anti-graffiti coating where indicated on the Plans. The anti-graffiti coating shall be a two-component, oil free, non-yellowing, aliphatic, polyester polyurethane coating. The material shall be approved by the Engineer prior to its application.

D. Form Liners

Form liners shall be of elastomeric type of the patterns indicated on the Plans. The liner may be factory bonded or field laminated following the manufacturer's recommendations and instructions. The number of uses per form liner shall not exceed the manufacturer's recommendations.

E. Paint

Paint shall conform to the Special Note "Preparation and Painting of Steel Surfaces" in the Proposal.

All other materials specified in the Contractor's noise barrier design shall be in accordance to the appropriate section of the NYSDOT Standard Specification (Metric Units) of January 2, 2002.

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FABRICATION (Concrete Panels and Posts)

The noise barrier shall meet the fabrication, curing and repair requirements of §704-03 Precast Concrete - General and/or §718-01 Prestressed Concrete Units (Structural) with the following modifications and additions:

A. General

Panels and posts shall be fabricated to conform to the shapes, sizes, textures, and colors shown on the Plans.

The contractor shall provide complete design details of the noise barrier. Noise barrier designs shall be submitted by the contractor, to the Department, for approval. Six (6) complete sets of working drawings and two (2) sets of design calculations for the concrete panels, posts, and foundations shall be submitted to the Materials Bureau or the Structures Division for approval as follows: The processing, approval, and transmittal of noise barrier designs shall be in accordance with procedural directives of the Materials Bureau for Precast Concrete Systems and the Structures Group for the Prestressed Concrete Systems and any other procedural directives as applicable. Designs shall be submitted to the Engineer at least 45 working days prior to the start of fabrication and shall include a complete set of working drawings and a complete set of design calculations. Design of the noise barrier system shall be in accordance with the AASHTO "Guide Specifications for the Structural Design of Sound Barriers, 1989" & "2002 Interim to Guide Specifications for Structural Design of Sound Barriers" except that the design wind load shall be 1,859 Pa applied perpendicular to the wall surface. For noise barriers in excess of 8.80 meters in height the contractor shall use design wind loads as specified by the Deputy Chief Engineer Structures (D.C.E.S.). The drawings and design calculations shall be stamped by a Professional Engineer licensed, and registered, to practice in New York State.

The manufacturer shall produce panels and posts that are uniform in appearance. The units shall be cast from steel forms with an elastomeric form liner of specified textures.

The panels and posts shall have a surface texture or treatment on both the highway and residential sides as shown on the Plans. The panel fabricator shall stipulate on the shop drawings the method he intends to use to achieve the above stated surface treatments. A sample of 600mm by 600mm by full panel thickness of the noise barrier panel with the integral color and with all proposed surface treatments shall be submitted to the Engineer for color approval prior to production of the sample noise barrier panels. The concrete precaster shall then construct, at his plant or at a location on the project determined by the Engineer, an acceptable sample noise barrier wall consisting of five posts and four panels. The wall shall be a minimum of 5.5 meters high and shall be the same size and configuration as the noise barriers on the actual project. These test posts and panels will be used to determine the acceptability of the various surface treatments, color and quality of the construction of both the roadway and residential sides of the noise barrier. If test sections are found to be unacceptable, the concrete precaster shall make additional samples until an acceptable product is produced. Any additional posts and panels will be made at the Contractor's expense. No panels for the actual noise barrier shall be fabricated until written approval of the sample noise barrier is given. Once these posts and panels have been approved, they shall be retained and used as the standards

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to determine acceptability of production posts and panels. The panels may be used on the Project at the end of precasting operations when released by the Engineer.

B. Integrally Colored Concrete.

The exact quantity of pigment to be added shall be determined based on the preparation, examination and approval of the 600mm by 600mm by full panel thickness test panel or panels to produce the color in the materials §C.1 of this Specification.

The tint used for all the concrete in the posts and panels shall be from the same batch.

A high quality form release oil, compatible with the integral color, shall be used.

C. Quality Assurance

1. When a Precast Noise Barrier System is used is the Sampling and Testing, Shipping and Basis of Acceptance for the precast noise barrier units shall be in accordance with the requirements of §704-03.
2. When a Prestressed Noise Barrier System is used the inspection, testing, and acceptance for shipping shall be in accordance with the P.C.C.M.
3. The units arriving at the job site are subject to final evaluation by the Engineer. Damaged or defective units are subject to rejection.

CERTIFICATION

The Contractor shall submit a certificate stating his compliance with these Specifications and the Plans.

CONSTRUCTION DETAILS

Holes for post foundations shall be preaugered, true, and plumb as approved by the Engineer. Precautions shall be taken to protect the holes from collapse. Holes shall contain no free water at the time of concrete placement. The holes shall then be filled with Class HP concrete in direct contact with the soil, properly consolidated to a point shown on the Plans as the top of footing elevation. Posts and panels shall be true and plumb and installed after a seven day curing period in accordance with the approved Contractor's noise barrier design details. The Contractor shall perform any required grading as specified on the plans.

The Contractor shall employ an approved jig method to set posts or post plate anchor bolts to assure proper centerline to centerline spacing and plumbness of posts. The Contractor shall submit shop drawings for the jig method to be employed to the Engineer prior to the use.

After the posts are set in their final, truly vertical position, if base plates are used, the space between the baseplate and the top of the footing shall be filled with grout meeting the requirements of Section 701-05, Concrete Grouting Material. The requirements of §568-3.02 shall apply.

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After final placement, exposed panel faces shall have the anti-graffiti coating applied where indicated on the Plans in accordance with the manufacturer's surface preparation instructions and recommendations.

Minor defect repairs such as touch-up field painting shall be made as ordered by the Engineer after final placement.

METHOD OF MEASUREMENT

The Noise Barrier System will be measured by the total number of square meters of the noise barrier measured from the top to the bottom of the wall panels and from center to center of posts. Only one side of the barrier will be measured for payment.

BASIS OF PAYMENT

The unit price bid per square meter of Noise Barrier System shall include the cost of all structural design and detailing, as well as all labor, materials, grading, form liners, anti-graffiti coating and equipment necessary to perform the work. Structural steel, grout, footing concrete, and all other materials required by the Contractor's specific noise barrier design will not be paid for under any other item. No additional payment will be made for the required samples.

Progress payments for this work will be made as follows:

1. Twenty (20) percent of the quantity will be paid for after all foundations are in place to the satisfaction of the Engineer.
2. Twenty (20) percent of the quantity will be paid for after all posts have been erected to the satisfaction of the Engineer.
3. The remainder of the quantity will be paid for after all panels have been erected to the satisfaction of the Engineer.