

ITEM 607.9910 09 - PRECAST CONCRETE NOISE BARRIER SYSTEM

DESCRIPTION

This work shall consist of furnishing and erecting a precast concrete noise barrier wall at the locations and to the elevations shown in the contract documents and as directed by the Engineer.

MATERIALS

The following sections of the standard specifications shall apply:

Portland Cement Concrete– General	501-2
Structural Concrete	555-2
Reinforcing Steel for Concrete Structures	556-2
Precast Concrete – General	704-03
Preformed, Closed-Cell Foam Material	705-08
Structural Steel	715-01
Galvanized Coatings and Repair Methods	719-01
Anchor Bolts	723-60
Rubber Impregnated Woven Cotton-Polyester Fabric	728-01
Rubber Impregnated Random Fiber Pad	728-02

and the following ASTM reference shall apply:

Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service or Both	ASTM A194
Standard Specifications for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength	ASTM A325
Standard Specification for Carbon and Alloy Steel Nuts	ASTM A563
Standard Specification for Concrete Aggregates	ASTM C33
Standard Specification for Hardened Steel Washers	ASTM F436

and the following standards shall apply:

NYSDOT LRFD Bridge Design Specification	NYSDOT LRFD
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with the following modifications and additions:

- A. Precast Concrete:** The concrete for precast panels, posts and caps shall have a minimum compressive strength of 35 MPa at 28 days.
- B. Cast In Place Concrete:** The concrete for cast in place piers and footings shall be Class A meeting the requirements of §501 Portland Cement Concrete - General.
- C. Reinforcing Steel:** Reinforcing steel used in precast concrete panels and posts shall be epoxy coated.

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D. Coarse Aggregate: The coarse aggregate, used in precast components with an exposed aggregate finish, shall be screened gravel with a No. 1 size designation. A coarse aggregate gradation meeting the requirements of ASTM C 33, size No. 67 may be used as an alternate to size No. 1. The screened gravel shall be the color indicated in the contract documents. Samples, (1-gallon each) shall be submitted for approval prior to the start of production.

E. Misc. Materials:

Post base plate	§715-01
Caulking compound	§705-06
Backer rod	polyethylene conforming to ASTM D5249-10 Type I
Neoprene pads	§728-01 or §728-02
Anchor bolts	§723-60 and be galvanization §719-01, Type II
Bolts	ASTM A325, Type I; galvanization §719-01, Type II
Nuts	ASTM A563, Grade DH or ASTM A194, Grade 2H and be galvanized in accordance with §719-01, Type II
Washers	ASTM F436 and be galvanization §719-01, Type II
Miscellaneous steel connection hardware	galvanization §719-01, Type II
Closed cell foam gasket	§705-08

F. Anti- Graffiti Coating: Exposed concrete surfaces shall receive an anti-graffiti coating. The anti-graffiti coating shall be

- one component,
- clear-drying,
- non-sacrificial (permanent),
- tested according to ASTM D7089 and capable of achieving a rating of “Cleanability Level 1” after cleaning,
- applied at the precast manufacturer, no anti-graffiti coating shall be field applied, and
- applied according to manufacturer’s instructions.

SI-Coat 531
as manufactured by
CSL Silicones Inc
144 Woodlawn Road West
Guelph, ON N1H 1B5
Canada
1.800.265.2753
www.csilsilicones.com

Blok-Guard & Graffiti Control II
as manufactured by
PROSOCO
3741 Greenway Circle
Lawrence, KS 66046
1.800.255.4255
1.800.255.4255
www.prosoco.com

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Permashield Non-Sacrificial #5300/5400
as manufactured by
Monopole, Inc
4661 Alger Street
Los Angeles, CA 90039
1.818.500.8585
www.monopoleinc.com

Or equal as approved by the Engineer.

DESIGN:

The Contractor shall design the precast concrete noise barrier system and components in accordance with these specifications, the contract documents and in conformance with the NYSDOT LRFD Bridge Design Specification, latest edition. Submit the design package to the Materials Bureau in accordance with the requirements for Drawing in §704-03 – *Precast Concrete - General*

Fabricator Working Drawings:

Fabricator working drawings shall be provided before beginning any work related to the precast concrete noise barrier system. No components of the precast concrete noise barrier system shall be fabricated until design calculations and drawings have been approved.

The fabricator working drawings shall include design calculations, detail all relevant aspects of the precast concrete installation and shall be submitted for review and approval, including connections. The shop drawings shall be stamped by a professional engineer who is licensed and registered in the State of New York.

The noise barrier system design shall include the details for connecting the posts to the footing and for connecting the panels to the posts. The details shall include the sizes of all bolts, nuts, washers, plates, and shapes to be used along with the applicable material specifications for them. The panel to post connection shall be designed to be as inconspicuous as possible.

Refer to the contract documents for the footing code that determines foundation diameter and depth for each post for the noise barrier system.

FABRICATION:

The fabrication, curing, and repair requirements for precast components shall meet the requirements of §704-03. Precast Concrete - General, with the following modifications and additions:

- A. **Fabrication:** Panels shall be full height with no horizontal joints.

The concrete posts shall have a smooth finish. One face of the wall panels shall have completely covered, uniform surface of exposed aggregate. The depth of exposure shall be 30% of the primary size dimension of the coarse aggregate exposed.

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The other face of the wall panels shall have a form liner finish. Architectural treatments shall meet the requirements of §704-03. Refer to the contract documents for form liner style required.

- B. **Repair:** The fabricator shall submit to the Materials Bureau for approval a procedure for repairing damaged areas in the exposed aggregate and form liner finish. No repairs to the exposed aggregate or form liner finish shall be made until a procedure has been approved.

ACCEPTANCE:

The sampling and testing, marking, final product inspection, shipping and basis of acceptance requirements for precast components shall meet the requirements of §704-03 Precast Concrete - General.

CONSTRUCTION DETAILS

The following sections of the standard specifications shall apply:

Trench, Culvert and Structure Excavation	206-3
Structural Concrete	555-3

Holes for post piers shall be pre-bored, true and plumb, to the depth and diameter shown in the contract documents. Precautions shall be taken to protect the holes from collapse. Holes shall contain no free water at the time of concrete placement. Holes shall then be filled with Class A concrete in direct contact with soil, properly consolidated to a point 150 mm below the ground surface.

The Contractor shall lift, place, and secure precast concrete wall units in accordance with manufacturer's instructions and approved shop drawings. Follow erection procedures and sequences of erection as recommended by precast concrete wall manufacturer. When overhead utilities are present above the proposed noise barrier, placement methods must be approved by the Engineer. Consideration shall be given to a method different than placement from above.

Posts shall be true and plumb within 13 mm of the total height. Top of posts and panel shall be within 13 mm of the elevations noted in the contract documents. The Contractor shall perform any required grading between the posts to provide a continuous and smooth ground line which will meet the tolerances shown on the drawings for the distance between the bottom of the panel and the ground surface.

METHOD OF MEASUREMENT

The work will be measured for payment as the number of square meters of precast concrete noise barrier system furnished and erected.

The Noise Barrier System will be measured as 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.

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Only one side of the proposed wall will be measured for payment. No additional payment will be made for the canted panels.

No payment will be made for the portion of the post caps (all types) that extend above the top of the wall elevation.

BASIS OF PAYMENT

The unit bid price per square meter of precast concrete noise barrier system furnished and erected shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily perform the work. Work includes, excavation, concrete foundation, reinforcement, backfill, hardware (anchor bolts, nuts, washers, etc.), final grading along the noise wall, anti-graffiti coating and the cost incurred in the event of royalties is also included.