

ITEM 563.1001NN 16 - PRECAST CONCRETE BRIDGE SYSTEM

DESCRIPTION

The work consists of designing, fabricating and erecting a precast concrete bridge system(s) at the location(s) indicated on the Contract Plans. A precast concrete bridge system is composed of the following discrete elements:

1. Precast Girders
2. Precast Deck Panels
3. Steel Laminated Elastomeric Bridge Bearings
4. Closure Pours
5. Concrete Overlay
6. Concrete Barriers

MATERIALS

Materials necessary for completion of this work shall meet the following requirements:

Precast concrete components shall meet the requirements of the PCCM and §718-06 High Performance Concrete for Prestressed Bridge Beams.

Steel Laminated Elastomeric Bridge Bearings shall meet the requirements of §565 “Bridge Bearings”.

Cast-in-place concrete for the closure pours shall meet the requirements of Class HP concrete Section §501. If higher strength is needed, the Contractor’s Engineer may establish different requirements, but must include the same percentage of microsilica and pozzalon.

Tendon Grout will be accepted when the manufacturer certifies that it meets the requirements shown below.

Prepackaged, cementitious material containing no metallic expansion aides that, when mixed with water at the proposed water/cementitious material ratio ($w/c \leq 0.40$), meets the requirements of Table 701-10.

**TABLE 701-10
DUCT GROUTING MATERIAL**

Test Requirement	Min.	Max.
Initial Set, hours	1½	12
Expansion, (%)	0.0	0.40
24 Hour Compressive Strength, MPa	15	-
7 Day Compressive Strength, MPa	25	-
28 Day Compressive Strength, MPa	35	-
Fluidity efflux time, seconds	11	30
Total Chloride Content, % by weight	-	0.05
Total Sulfate Content, % by weight	-	5.0

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Steel Reinforcement shall meet the requirements of §556 “Reinforcing Steel for Concrete Structures”.

Concrete Overlay shall meet the requirements of §584 “Specialized Overlays for Structural Slabs”.

Concrete Barriers shall meet the requirements of §569 “Permanent Concrete Traffic Barrier for Structures”.

CONSTRUCTION DETAILS

Design.

An appropriate structure design meeting the design parameters given in these specifications and on the contract plans and containing all details necessary for fabrication, construction, and erection shall be developed and submitted to the DCES for approval. All design work, detail development, and proposed handling and installation procedure development, shall be done by a Professional Engineer. The design submittal shall conform to the requirements stated in the PCCM. The DCES reserves the right to reject a proposed design(s) if the structure type is determined to be unsuitable for the proposed application based on safety, durability, serviceability, or maintainability.

The Load Rating shall be determined in accordance with the AASHTO "Manual for Condition Evaluation of Bridges, 1994 - Second Edition," with all interim provisions in effect. The contractor shall show which method (working stress or load factor) was used in load rating computations. The load rating shall be shown on the Production Note Sheet of the shop drawings. The contractor shall include all load rating computations in the design calculation submittal.

Design Parameters.

The design of the structure(s) described above shall meet the following:

1. Design Specifications : New York State Department of Transportation LRFD Bridge Design Specifications
2. Live Load : HL-93 and NYS Permit Truck
3. Highway Profile : As shown in the contract documents.
4. Structure Layout : As shown in the contract documents.
5. Concrete Stress Limits : As per the provisions of Section 5-9 Prestressing and Partial Prestressing of NYSDOT LRFD Specifications, except for the following limitation: The maximum tensile stress in concrete for handling and erection loads shall not exceed $0.40\sqrt{f'ci}$, where $\sqrt{f'ci}$ is the compressive strength at the time being considered.

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6. Concrete Barriers : The barrier on the structure shall be designed to adequate global and local capacities required to resist the loads specified in the New York State Department of Transportation LRFD Bridge Design Specifications.

Note: The size and shape of the Precast Girders and Deck Panels shown in the contract documents is for illustration purposes only. Other sizes and shapes meeting the design parameters are acceptable, unless otherwise noted in the contract documents.

Changes to Design Parameters.

If the Contractor wants to propose a structure not in full compliance with the design parameters in the contract, a preliminary proposal, fully explaining the changed design parameters shall be submitted to the DCES for review and approval. The Contractor is not expected to develop a detailed design until the proposed design parameters have been approved by the DCES.

Design Computations, Shop Drawings/Detail Drawings.

The preparation and submission for review and approval by the Department of the precast components shall be in accordance with the PCCM. Shop drawings shall show the required tolerances for the geometry of all precast components, placement of reinforcement, location of all inserts, etc. Design shall consider the effects of these tolerances. In addition, the shop drawings for the precast components shall show the detailed handling procedure to be used during fabrication, storage, and transportation of the precast components. All necessary supporting calculations shall be included in the design computation package.

The preparation and submission for review and approval of the steel components shall be according to the SCM. Shop drawings shall show the required tolerances for the geometry of all steel components. Design shall consider the effects of these tolerances. All necessary supporting calculations shall be included in the design computation package.

Fabrication.

Fabrication of all precast components shall be in accordance with the PCCM.

Installation Drawings.

Installation drawings shall be prepared and submitted with the shop drawings for review and approval by the Department. They shall meet the requirements of the PCCM and the following:

- A. Details for all cast-in-place concrete not detailed in the contract documents.

Erection Drawings.

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A separate set of erection drawings shall be prepared and submitted for review and approval of the Department in accordance with the provisions of Section 2.6 "Erection Drawings of the PCCM.

Installation/Erection.

Installation and Erection of all precast components shall be in accordance with the approved installation and erection drawings. All components after installation and erection shall be inspected for cracks or other visible defects. All defective components shall be replaced or repaired, using procedures approved by the DCES This work shall be preformed at no additional cost to the state.

Tolerances shall meet the requirements of the PCCM and the following erection tolerances.

- A. Joint Width: ± 10 mm
- B. Vertical Difference Between Top of Adjacent Deck Panels : ± 13 mm
- C. Span – Variation From Post-Pour Measurement Recorded on the Shipping Paperwork: ± 8 mm
- D. Girder – PCCM Tolerance for Box Beams

METHOD OF MEASUREMENT

This work will be measured on a lump sum basis.

BASIS OF PAYMENT

The lump sum price bid shall include the cost of furnishing all engineering, labor, materials, and equipment necessary to satisfactorily complete the work.

Item No.	Item	Pay Unit
ITEM 563.1001NN 16	Precast Concrete Bridge System	lump sum

Note: Serialization for the Span Units: nn represents the specific structure identifier.