

PRECAST CONCRETE/STEEL COMPOSITE PIER CAP

**\*\*From New Haven BRF 0183(1)**

- xx. DESCRIPTION. This work shall consist of manufacturing, transporting, and erecting a precast concrete/steel composite pier cap unit as shown on the Plans.

The work under this Section shall be performed in accordance with these provisions, the Plans, and referenced Sections of the Standard Specifications.

- xx. MATERIALS. Materials shall meet the requirements of the following Subsections:

Grout.....	707.03
Structural Steel .....	506.02
Reinforcing Steel .....	507.02
Precast Concrete.....	540.02
Concrete Repair Material.....	780.01-780.04

- xx. GENERAL FABRICATION REQUIREMENTS. The structural steel furnished under this Section shall be fabricated in a plant meeting the requirements of Subsection 506.03. After fabrication, the structural steel shall be transported to a plant meeting the requirements of Subsection 540.03(a), where the remainder of the precast concrete/steel composite pier cap unit shall be fabricated.

Structural steel fabrication shall be performed in accordance with Section 506.

Precast concrete fabrication shall be performed in accordance with Section 540.

Bar reinforcement shall be furnished and installed in conformance with Section 507.

Concrete mix and proportioning shall meet the requirements of Subsection 501.03 for Concrete, High Performance Class A.

Concrete shall not be deposited in the forms until the Agency representative has approved placement of the reinforcement and inserts.

The unit shall not be shipped until the minimum 28-day strength is attained and it has been approved by the Agency. A 48-hour advance notice of the loading and shipping schedule shall be provided. The unit shall be secured on the vehicle in order that no cracking will occur during transport. The Contractor shall secure the necessary hauling permits.

- xx. FABRICATION DRAWINGS. The Fabricator(s) shall submit Fabrication Drawings for the precast concrete/steel composite pier cap unit, including but not limited to precast concrete, reinforcing steel, structural steel, shear connectors, post-tensioning system components, lift points and their reinforcement, handling procedures, and erection plans and procedures in accordance with Subsection 105.03, to include

the information requirements specified in Subsections 506.04 and 540.04.

Detailed handling, lifting, and shipping procedures shall be developed. The procedures shall clearly identify for the Precast Concrete Fabricator the method of lifting and supporting the steel elements during the precast concrete operations so as not to effect the girder alignment, camber, coatings, etc. The procedures shall define the correct lifting, handling, and shipping of the composite unit or its constituents at all stages of fabrication and erection.

The Contractor shall have an Engineer responsible for ensuring that all of the components of the precast concrete/steel composite unit are coordinated between the Steel Fabricator and the Precast Concrete Fabricator. The Engineer shall verify the design, detailing, and fabrication of all components of the work to ensure that proper fit-up is achieved. Steel and precast Fabrication Drawings shall be submitted in a combined submittal to the Engineer prior to submission to the Agency. Common geometry control shall be established between the Fabrication Drawings.

The Contractor's Engineer is responsible for performing a documented review, to include a QA sign-off of all plans, procedures, and Fabrication Drawings to ensure interfaces between the various elements are not in conflict and are in accordance with design documents. The contractor's Engineer shall have independent survey checks performed to ensure proper alignment of the pier cap in the field.

xx. FABRICATION /INSTALLATION.

- (a) Pre-production meeting. Unless the Engineer deems, in writing, that a pre-production meeting is unnecessary, then a pre-production meeting shall be held a minimum of seven (7) calendar prior to beginning concrete placement. The pre-production meeting shall be attended by, as a minimum but not limited to, the crew supervisor, contractor project manager, concrete producer, Resident Engineer, project manager, and composite Material Engineer.
- (b) Fabrication Sequence. Fabricate all steel superstructure components at steel fabrication plant. Erect steel beams and all diaphragms on temporary blocking and match drill the girder splice plates. Reassemble the complete 2 span superstructure unit on temporary blocking at precast location. Install rebar and removable forms for the precast composite pier cap beam.
- (c) Erection Plan. Cranes, lifting devices, and other equipment for erecting the precast concrete/steel composite pier cap unit shall be of adequate design and capacity to safely erect, align, and secure all members and components in their final positions without damage. The Contractor is solely responsible for the methods and equipment employed for the erection of the precast concrete/steel composite pier cap unit.

The Contractor shall submit Construction Drawings in accordance with Section 105 for the methods and sequence of precast

concrete/steel composite pier cap unit erection, the temporary bracing, and the equipment to be used for the erection. The erection plan shall include the necessary computations to indicate the magnitude of stress in the unit during erection and to demonstrate that all of the erection equipment has adequate capacity for the work to be performed. The erection plan shall contain provisions for all stages of construction, including temporary stoppages.

Submittal of the erection plan is for the Agency's information only, and shall in no way be construed as approval of the proposed method of erection. Unless otherwise directed by the Engineer, the Contractor shall follow the erection plan as submitted.

- (d) Unit Erection. Erection of the unit shall not proceed until substructure concrete has been cured for the minimum length of time specified in Subsection 501.17. The unit shall be installed to the correct line and grade as shown on the Plans and approved Working Drawings and as indicated in the approved Erection Plan. After the unit is erected, it shall be inspected to ensure the correctness of its location.
- (e) Tolerances. Contractor's Engineer shall define tolerances and include in fabrication drawings to be approved by the Engineer.
- (f) Structural Steel. All diaphragms and other structural steel work shall be installed as shown on the approved Erection Plan after the unit is in its final location.
- (g) Sealing of Lifting Holes. After the unit is in its final location, a bonding agent shall be applied and the lifting holes filled with cementitious polymer shrinkage compensated grout. A removable form shall be provided at the bottom surface of the deck to retain the grout.
- (h) Loading. The unit may not be loaded until joint material has properly and finally cured, and as approved by the Engineer. The grout shall be cured in accordance with the manufacturer's instructions until design strength has been met.
- (i) Final Repairs. After the installation work is complete, remaining holes for inserts, and lifting holes shall be repaired as specified in Subsection 540.11.
- (j) Grout. Contractor shall submit product data sheet and grouting procedure for approval by the Engineer.
- (k) Technical Assistance. The Contractor shall have their Engineer available during the erection of the precast concrete/steel composite pier cap unit to provide technical assistance to the Contractor in the event unusual problems or special circumstances arise.

xx. METHOD OF MEASUREMENT. The quantity of Special Provision (Precast

Concrete/Steel Composite Pier Cap) to be measured for payment will be on a lump sum basis in the complete and accepted work.

- xx. BASIS OF PAYMENT. The accepted quantity of Special Provision (Precast Concrete/Steel Composite Pier Cap) will be paid for at the Contract lump sum price. Payment will be full compensation for detailing, fabricating, repairing, quality control testing, transporting, handling, and installing the materials specified, including concrete, reinforcing steel, grout, corrugated sleeves ,structural steel, shear studs, connectors, and shims; for designing and installing lift brackets and any other material contained within or attached to the members; for any grouting work required; for furnishing and implementing the erection plan; and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
900.645 Special Provision (Precast Concrete/Steel Composite Pier Cap)	Lump Sum