

**FFO - US30: Burnt River & UPRR Bridge Project  
Grading, Structures & Paving**

This work includes field casting Ultra High-Performance Concrete (UHPC) in joints between precast prestressed concrete deck members and in haunches between precast prestressed concrete deck and girders members.

**00550.03 Alternate Designs** – Replace the first and third bullets with the following:

- Before manufacturing the precast members and steel midspan diaphragms, submit stamped design calculations, working drawings and specifications for all modified precast concrete and structural steel members according to 00150.35.
- Do not increase member dimensions more than 1 inch, except that flange width may be decreased by 11 inches, bulb width may be increased by 8 1/2 inches and overall depth may be increased by up to 2 inches from the dimensions shown. Where overall depth is increased, verify that the required minimum vertical roadway clearance has been maintained.

Add the following subsection:

**00550.04(c) Deck Panel Tolerance** – Provide a final riding surface where the gap in any direction below a 12 foot unlevelled straightedge does not vary from the testing edge by more than 1/8 inch. Where necessary, grinding up to 1/2 inch in depth with a diamond-tipped grinding machine is permissible. Perform grinding at no additional cost to the Agency.

**00550.11 Materials** – Add the following to the end of this subsection:

Ductal® JS1000 UHPC from Lafarge North America, Inc.

Contact:  
Vic Perry  
Lafarge North America  
#1200, 10655 Southport RD SW  
Calgary, Alberta T2W 4Y1  
Phone (403) 225-5456  
Fax (403) 278-7420

Add the following subsection:

**00550.14 UHPC, QC** – Take four sets of compressive strength test samples for each day of placement. Each set consists of 3 cylinders, 3 inch dia. x 6 inches. Moist cure cylinders for 4 days. After 4 days, keep cylinders sheltered in open air.

Cylinders will be tested at 4 days and 28 days. One set will be tested between 4 days and 28 days. One set will be treated as a reserve set. Compressive strength will be measured by ASTM C39.

Ensure the UHPC material satisfies the following minimum strengths:

- 14,000 psi minimum compressive strength at 14 days

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- 17,000 psi minimum compressive strength at 28 days

Add the following subsection:

**00550.37 UHPC Pre-Pour Conference**– Prior to initial placement of UHPC, arrange for an on-site meeting with the UHPC representative. Ensure attendance by the Engineer and the Contractor's staff. Discuss the proposed procedures for mixing, transport, finishing and curing of the UHPC material.

Arrange for a representative of the UHPC supplier to be on site during placement of the joints. Ensure the representative is knowledgeable in the supply, mixing, delivery, placement, and curing of the UHPC material.

Add the following subsection:

**00550.39 Precast Deck Members and UHPC Observations** – Accommodate on site observations of Agency and Consultant personnel during erection of precast members and placement of UHPC.

Notify the Engineer at least 30 days prior to precast member erection operations and UHPC placement operations. The Engineer will arrange and organize on site observations and ensure observations allow Contractor to maintain normal work flow.

**00550.40 Forming** – Add the following to the end of this subsection:

Design and fabricate forms for UHPC joints according to the manufacturer's recommendations. Construct forms for UHPC joints from plywood. Provide Evazote® compressible foam or approved equal between precast deck and girder top flanges to form haunches. Use methods and equipment as required by the manufacturer to ensure all joints are completely filled.

Provide leak tight seals at form and Evazote® compressible foam joints as required by the manufacturer to ensure the integrity of the UHPC mix is maintained.

Add the following subsection:

**00550.43(c) UHPC** – Follow the batching sequence as specified by the supplier and approved by the Engineer. Place UHPC so that the surface of the UHPC is flush with the precast deck panels to within a tolerance of plus or minus 1/8 inch.

Add the following subsection:

**00550.45(d) UHPC** – Cure UHPC according to the manufacturer's recommendations for a minimum of four days at a minimum temperature of 60°F.

**00550.47 Surface Finish** - In the paragraph that begins "Provide a roadway finish...", replace the sentence that begins "Provide a roadway finish ..." with the following three sentences:

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Provide a roadway finish on the tops of members that do not have an asphalt concrete wearing surface. Provide a light broom finish on the tops of members that have an asphalt concrete wearing surface. Provide a light broom finish for all UHPC.

Add the following subsection:

**00550.47(c) Surface Finish for Precast Deck Panels** – Provide a roadway finish on the tops of precast deck panels. Provide a general surface finish for the bottom and external edges of precast deck panels.

Add the following subsection:

**00550.49(e) Plan Assembly** – Assemble the precast girders and the center precast deck panel at the plant to ensure leveling bolt, shear blockout and component fit-up prior to shipping. Layout the locations of all remaining leveling bolts, shear pockets and panel joints to verify fit-up. Complete all corrective work at no additional cost to the agency prior to transporting members.

**00550.50 Tie Rods** - In the third bullet, replace the sentence that begins "Install compressible washer..." with the following sentence:

Install compressible washer type direct tension indicators under the turned nuts and tighten the nuts as recommended by the manufacturer until the gaps in the indicators are nil or as shown.

**00550.80 Measurement** – Replace this subsection with the following:

**00550.80 Measurement** - The quantities of work performed under this Section will be measured as follows:

**(a) Length Basis** – Precast prestressed girders will be measured on the length basis. Work measured on the length basis will be the sum of the horizontal lengths shown for each type and size of member. Field measurement of each member length will not be made. The quantities will be determined by calculating the theoretical horizontal length shown, added together for a total for each type and size, rounded to the nearest foot.

**(b) Area Basis** – Precast prestressed deck panels will be measured on the area basis. Work measured on the area basis will be the sum of the horizontal areas shown for each type and size of member. Field measurement of each member area will not be made. The quantities will be determined by calculating the theoretical horizontal length and width shown for each panel, added together for a total for each type and size, rounded to the nearest square foot.

**(c) Lump Sum** – No measurement of quantities will be made for UHPC.

The estimated quantity of UHPC is:

UHPC.....25 CUYD

**00550.90 Payment** – Add the following to the list of pay items:

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**Pay Item  
Unit of Measurement**

- (d) Precast Prestressed Deck Panels.....SQFT
- (e) UHPC Concrete.....Lump Sum

**00550.90 Payment** – Add the following sentence:

Payment for UHPC Concrete will be payment in full for furnishing all UHPC materials, mixing and placing equipment, formwork including curing components, equipment, Manufacture’s Representative, labor and incidentals necessary to complete the work as specified.

**00550.90 Payment** – Add the following bulleted item:

- Plant assembly, fit-up and corrective work

**SECTION 00560 - STRUCTURAL STEEL BRIDGES**

Comply with Section 00560 of the Standard Specifications modified as follows:

**00560.29(c-5) Turn-of-Nut Tightening** - In Table 00560-3 replace the "Bolt Length" column with the following column:

**Bolt Length (underside of head to end of bolt)**

Up to and including 4 diameters

Over 4 diameters but not exceeding 8 diameters

Over 8 diameters but not exceeding 12 diameters <sup>2</sup>

**00560.80 Measurement** - Add the following to the end of this subsection:

The estimated quantity of structural steel is:

<b>Structure</b>	<b>Steel Type</b>	<b>Quantity (Pound)</b>
Bridge No. 21252	A709 Grade 50	2700

**00560.90 Payment** - Replace the paragraph that begins "The accepted quantities..." with the following:

The accepted quantities of work performed under this Section will be paid for at the Contract unit price, per unit of measurement, for the following items:

<b>Pay Item</b>	<b>Unit of Measurement</b>
(a) Structural Steel Diaphragms.....	Lump Sum