BEDFORD
13527

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S P E C I A L P R O V I S I O N

AMENDMENT TO SECTION 528 -- PRESTRESSED CONCRETE MEMBERS

This special provision allows the optional use of precast elements to construct stub abutments, approach slabs, and piers for the cast in place elements detailed on the plans. All applicable provisions of 528 shall apply to precast concrete except as amended or modified below. Refer to PCINER-06-ABC "Guidelines for Accelerated Bridge Construction Using Precast/Prestressed Concrete Components" (www.pcine.org) for more information and additional guidelines. This specification includes provisions for self-consolidating concrete.

Replace 528.2.8.2 with the following:

2.8.2 Mix Design for Precast Substitution. The fabricator shall design and submit for approval the proportions and test results for a concrete mix which shall attain the minimum properties in 520 Table 1A. Compressive strength test cylinders shall be sampled in accordance with the requirements of AASHTO T 141, molded and cured in accordance with the requirements of AASHTO T23, and tested in accordance with the requirements of AASHTO T 22. The permeability shall be measured at 56 days using AASHTO T 277. Air entrainment testing shall be in accordance with AASHTO T 119 and T 152. The minimum average compressive strength of the proposed mix shall be determined using the procedure in Appendix D of 528.

Add to 528.2.8 the following:

2.8.4 Mix designs for Self Consolidating Concrete shall be submitted for approval to the Bureau of Materials and Research. Mix designs and material testing shall conform to the Interim Guidelines for the use of Self-Consolidating Concrete in Precast/Prestressed Concrete Institute Member Plants, PCI Report TR-6-03 (www.pci.org). Submittals shall be approved by the admixture manufacturer. Results of trial mixes shall be included with the mix design submittal and shall include all test results. Test results shall include: compressive strength; air content; permeability; slump flow; and U-tube test. Test results for the slump flow shall show that the mix meets the requirements for flow and that the aggregate distribution and mortar halo shall show no segregation or bleeding. Test results for the U-tube test shall show that the mix is capable of flowing around the reinforcing. Compression testing and permeability testing shall be done on rodded and non-rodded specimens to show that the material performs satisfactorily without consolidation.

Amend 528.2.9 to read:

2.9 Shear Key Grout for Butted Box Beams, Shear Keys, Joints and Blockouts

Amend 528.2.9.1 to read:

2.9.1 Grout for shear keys, joints, and blockouts shall be an approved grout as listed under Section 529A of the Qualified Products List. Additional aggregates and/or materials shall not be added to the material during field mixing. Grout shall have a minimum strength of the cast-in-place concrete that is being replaced.

Add to 528.2.10 the following:

2.10.1 Temporary supports, leveling screws, and shims shall be approved prior to use.

Amend 528.3.1.4.3.1 with the following:

3.1.4.3.1 At least thirty (30) days prior to fabrication of the precast members, a test placement [10 feet (3 meters) in length] of the actual member section (unreinforced) shall be poured utilizing the proposed methods of concrete placement and curing. The minimum air entrainment value shown in 520 Table 1A shall be held as the absolute minimum value for the test section. Concrete that does not meet this value shall not be used in the test section.

Add to 528.3.4 the following:

3.4.5 Upon approval, the shop drawings shall be transferred to permanent, archival quality, 22 inches by 34 inches (559 by 838 mm) double matte mylar and submitted to the Department.

3.4.6 The shop drawings shall be properly titled as to project location and bridge components similar to the Contract Plans title box. The shop drawings shall include but not necessarily be limited to the following:

a. Fully and accurately dimensioned views clearly showing the geometry of the members including all projections, recesses, notches, openings, blockouts, connections, etc.
b. Details and bending schedules of steel reinforcing clearly showing the size, spacing, and location including any special reinforcing items required but not shown on the contract plans. Reinforcing or ties provided under lifting devices shall be shown in detail.
c. Details and locations of all items to be embedded in the members such as inserts, lifting devices, leveling screws, temporary supports, etc.
d. Quantities for each member (concrete volume, reinforcing steel weight, and total section weight).
e. Description of methods for curing, handling, storing, transporting, and erecting the members.

Add to 528.3.17 the following:

3.17.3 Rejection of precast members. The Engineer will inspect the first group of members cast (not to exceed three members) upon removal from the casting bed. Defects will be identified and the Design-Builder shall propose to the Engineer in writing the preventative measures to be taken to eliminate those defects in the second group of members to be cast. Defects in members cast in the first group may be cause for rejection. After the second group is cast, the members again will be inspected and the Design-Builder shall again propose preventative measures as may be necessary. If other defects occur during subsequent casting of members, the above procedure shall be repeated. Any defect occurring a second time will be cause for rejection of the member in which it occurs.

3.17.3.1 The following are considered defects that may constitute cause for rejection:

1. Individual rock pockets or honeycomb over 6 square inches (3750 square mm) in area or over 1 inch (25 mm) deep.
2. Any member having more than one honeycomb area per side or surface even though of smaller scope than defined above.
3. Any discontinuity or crack in the concrete that would permit moisture to reach the reinforcing steel.
4. Edge or corner breakage exceeding 12 inches (300 mm) in length or over 1 inch (25 mm) in depth, and damaged ends where such damage would prevent making a satisfactory joint.
5. Extensive fine cracks or checks.
6. Precast sections produced by racked or otherwise distorted forms.

3.17.3.2 The Engineer may approve repairs to occasional, non-recurring, and isolated defects. The Design-Builder shall submit procedures and materials for repairs to the Engineer for approval.

Add to 528.3.19 the following:

3.19.4 Dimensional Tolerances of Precast Concrete Members.

3.19.4.1 All tolerances not specified otherwise, shall be in accordance with PCI MNL –135-00 "Tolerance Manual for Precast and Prestressed Concrete Construction" except as modified herein.

3.19.4.2 Tolerances for all substructure elements shall meet or exceed those listed for Flat Structural Wall Panels except for the following items:

d, variation from specified plan end squareness or skew = +/- 1/8"
f, sweep = +/- 1/8"

3.19.4.3 Vertical joints between adjacent wall members shall be adequately filled and sealed. Grouted shear keys may be introduced, as required, to meet fabrication and assembly tolerances. All shear keys introduced for fabrication and assembly convenience shall be detailed on the shop drawings.

Amend 528.3.20.2 to read:

3.20.2 Members shall be lifted only at the designated points by approved lifting devices embedded in the concrete and by following proper hoisting procedures. The Design-Builder is responsible for not exceeding allowable stresses in the precast members during handling and shall include all necessary member modifications on the shop drawings that are required to accommodate lifting and assembly loads and methods.