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REVISION OF SECTION 618
SEGMENTAL PRESTRESSED CONCRETE STRUCTURES

PERMANENT CHANGES TO PROJECT DATED SPECIAL PROVISIONS

REVISION OF SECTION 618 SEGMENTAL PRESTRESSED CONCRETE STRUCTURES

DATE	AUTHOR	DESCRIPTION OF CHANGE
9/19/90	MIKE MCMULLEN	MINOR CHANGE TO FORMAT
12/18/92	M. Dodson	Minor changes to format. Sections now in brown book deleted.
9/30/1999	M. Nord	This specification **does NOT** conform with the *1999 Colorado DOT Standard Specifications for Road and Bridge Construction*. Before use, this specification should be completely reviewed and revised as required. Converted to Microsoft Word 97 SR-2
04.11.2023	M. Kayen	Revisions to make spec online ADA-compliant. 5.22.23 Additional ADA.

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Delete and replace Section 618 of the Standard Specifications for post-tensioned bridges for this project with the following:

Subsection 618.01 shall include the following:

This work shall consist of the construction of post-tensioned concrete members per these specifications and in conformity with the plan details.

This work shall include the stressing, furnishing and installation of any items necessary for the particular prestressing systems to be used, including but not limited to ducts, prestressing steel, anchorage assemblies, reinforcing for prestressing, and grout used for pressure grouting ducts.

The term "segment" refers to a modular section of the superstructure consisting of the cross-section detailed on the plans. The lengths of the segments are detailed on the contract plans.

The length of the precast segments may be changed. The weight of each precast segment shall not exceed 50 tons or as permitted for handling and transporting subject to Engineer's approval. The length of cast-in-place segments shall be the length between construction gaps shown.

The term "match cast" refers to a fabrication procedure whereby a segment is cast against the preceding segment. Match casting may be accomplished by either the short line casting method or the long line casting method.

Subsection 618.03 shall include the following:

Post-tensioned members will be of the type, shape, and dimensions as shown on the plans.

The minimum strength of the concrete at the time of post-tensioning shall be 3500 psi or as given on the plans, whichever is greater.

Welds or grounds for welding equipment shall not be made on the forms or on the steel in the member after the prestressing steel has been installed, unless otherwise indicated on the plans.

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The Contractor will not be allowed to deviate from the erection method or erection sequence, as shown on the plans. However, the Contractor may add temporary post-tensioning for purposes of erection or supporting construction loads.

The Contractor may request and receive copies of all design information (calculations, computer output, etc.) submitted for this project. This request shall be made through the Project Engineer.

The Contractor shall submit drawings and calculations for the construction loading, if any, to which the bridge will be subjected during construction. These drawings and calculations shall:

1. Be prepared by an Engineer who is thoroughly knowledgeable in the design of post-tensioned concrete bridges.

2. Be per the current edition of the AASHTO Standard Specifications for Highway Bridges.

3. Illustrate the configuration and magnitude of the construction loads. If the loads will vary during the phases of construction, then the details shall show the critical loads at each phase.

4. Verify that the stresses on the plans or contained in the specifications are not exceeded. In addition, joints with well distributed bonded reinforcing crossing them (as is typical in precast segmental construction) shall have no tension across them during construction or under service load after the structure is completed. The tension in any part of the prestressed concrete during construction shall not exceed 6(f'ci)1/2 or 3(f'ci)1/2 for the top of the deck. The tension in any part of the prestressed concrete under service load after the structure is completed shall not exceed 6(f'c)1/2 or 3(f'c)1/2 for the top of the deck.

5. Verify that the foundation or pier column capacities are not exceeded.

6. If the Contractor intends to add temporary post-tensioning he shall submit complete details and calculations per subsection 618.03 (d) "Shop Drawings and Calculations" of this specification, for approval by the Engineer. The calculations shall meet the following requirements:

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A. The calculations shall show that any stresses indicated on the plans or contained in these specifications are not exceeded, at any phase of construction.

B. The calculations shall consider all effects due to dead load, prestressing, and construction loads.

C. The calculations shall be prepared by an Engineer who is thoroughly knowledgeable in the design of post-tensioned, concrete bridges.

D. The calculations shall be prepared per the AASHTO Standard Specifications for Highway Bridges.

7. Temporary post-tensioning details shall meet the following requirements:

A. The temporary prestressing steel shall be clearly identified on the shop drawings.

B. The method, procedure, and sequence of tensioning and de-tensioning the temporary prestressing steel shall be shown. The sequence shall be related to the permanent post-tensioning.

C. Details shall show any ducts, blockouts, or buildouts necessary for the temporary prestressing steel. Ducts or voids internal to the member for temporary prestressing steel shall not be left void but shall be grouted per these specifications.

D. Stressing blocks for any temporary prestressing systems anchorages may be located within the slabs, in partial diaphragms within box girders, in external systems temporarily anchored to the girders and removed after used, or a combination of any of the above methods. All construction added outside a girder for temporary prestressing shall be subsequently removed to restore the girder to the designed cross-section shown on the plans or as approved by the Engineer.

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E. The detail requirements for the temporary post-tensioning shall be per 618.03 (d) "Shop Drawings and Calculations".

8. The Engineer will have 5 weeks to review and approve the Contractor's construction loading and temporary post-tensioning details and calculations. If the details are not approved, they will be returned for corrections and resubmitted by Contractor, in the same manner as the first submittal.

   The time required for approval of resubmittals will not be more than 5 weeks per submittal. It is the intent of these specifications that not more than two resubmittals will be required. If additional submittals are required by actions of the Contractor, the additional time required for review and approval will be borne by the Contractor.

9. Only after the Contractor's construction loading and temporary post-tensioning details and calculations are approved will the Division review final shop drawings for post-tensioning, bearing devices, falsework, or expansion devices for the superstructure. Approval of these details and calculations will not relieve the Contractor of the responsibility for the structural adequacy of the bridge, or the performance of the temporary post-tensioning, under construction loading.

Subsection 618.10 shall include the following:

Post-Tensioned Members. The quantities of prestressing steel will not be measured but shall be the quantities shown on the plans, completed and accepted, which are required jacking forces (in thousands of KIPS) times their required lengths.

Subsection 618.11 shall include the following:

The accepted quantities will be paid for at the contract unit price per unit of measurement for each of the pay items listed below that is included in the bid schedule.

Payment will be made under:

Pay Item	Pay Unit
Prestressing Steel	M KFT

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Payment will be full compensation for all work necessary to complete the designated Pay Item per Section 109. This Pay Item shall include but not be limited to all anchorage devices, prestressing steel, ducts, grout, and miscellaneous hardware. Concrete and reinforcing steel not shown on the plans but required by the Contractor's alternate will not be paid for separately but shall be included in the work. Concrete quantities will not be reduced for the volume occupied by ducts, prestressing steel, anchorages, blockouts for tensioning, etc., and will not include web flares, projections, warts, etc., required to accommodate the prestressing system used.