

4620000 POST-TENSIONING
COMMENTS FROM INTERNAL/INDUSTRY REVIEW

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Comments: (6-16-11)

1. 462-1 General: I recommend deletion of this sentence. It is redundant. It is obvious that all materials mentioned in this specification has to meet the requirement of the specification.

462-1.1 Description: Furnish and install all post-tensioning systems and any other pertinent items necessary for the particular prestressing system used, including but not limited to ducts, anchorage assemblies and local zone reinforcement. *All Both temporary and permanent post-tensioning components which remain in the completed structure shall comply with the requirements of this Section.* Furnish all components of a post-tensioning system, including steel pipes, from a single supplier. Prestressing steel and local zone reinforcement can be obtained from any supplier.

Response: The sentence is required to clarify that even temporary PT that is used for erection and left in the bridge, but is not considered when determining the overall strength of the bridge, must still meet the requirements of the spec. No changes made.

2. 462-3 Definitions: There is no need to mention “regardless of its original use.”

Permanent Bar/Tendon: A bar or strand tendon that remains in the completed structure, regardless of its original use.

Response: See above response. No changes made

3. 462-4.2.5.1: Insert comma after tendons.

462-4.2.5.1 General: Use only plastic duct, steel pipe or a combination of plastic duct and steel pipe. Ensure that all connectors, connections and components of post-tensioning system hardware are air and water tight and pass the pressure test requirements herein. Use smooth plastic duct in all post-tensioning systems used for external tendons, *except where steel pipe is required.* Use corrugated plastic duct in all post-tensioning systems used for all internal tendons except where steel pipe is required.

Response: Don’t believe a comma is really necessary. No changes made.

4. 462-4.2.5.2: Define “element” and include the definition as part of 462-3.

462-4.2.5.2 Duct or Pipe Minimum Diameter: For prestressing bars, provide duct with a minimum internal diameter of at least 1/2- inch larger than the outside diameter, measured across the deformations. For prestressing bars with couplers, size the duct to be 1/2- inch larger than the ~~diameter~~ *largest dimension* of the *largest enclosed element* ~~bar and/or coupler.~~

For multi-strand tendons, provide ducts with a minimum cross-sectional area 2-1/2- times the cross-sectional area of the prestressing steel.

Response: The term “element” is used locally here to cover bars, nuts, couplers, washers, spacers, etc. that might be present adjacent to the splice. It is not a term that would apply broadly enough to PT components to warrant it being defined in 462-3. No changes made.

5. 462-4.2.5.6.1.: Write as a new sentence to read “Ensure that no cracks are exhibited under 2X magnification.”

Ensure all connections between steel pipe embedded in concrete and plastic duct are made by using a mechanical coupler or a circular sleeve made of Ethylene Propylene Diene Monomer (EPDM), having a minimum pressure rating (working pressure) of 100- psi. Use EPDM materials ~~having 100 % quality retention as defined by meeting the requirements of~~ ASTM D 1171 *using* Ozone Chamber Exposure Method- **B (no cracks permitted under 2X magnification).**

Response: Proposed wording reads better and is okay to substitute. Change made.

6. 462-6.2: First sentence is confusing. Change it to read. “For bars and strands located in the bridge superstructure,…”

462-6.2 During Installation in the Structure: *For bars located in superstructures and all strands,* The time between the first installation of the prestressing steel in the duct and the completion of the stressing and grouting operations shall not exceed ~~seven fourteen~~ **14** calendar days.

Response: Requirement is correct as stated as it applies to all strand tendons, not just strand tendons located in superstructures. No changes made.

7. 462-6.2: Second sentence, the same thing should be applicable to precast structures. *For bars located in cast-in-place substructures, the time between the first installation of the bar in the duct and the completion of the stressing and grouting operations shall not exceed 21 calendar days.*

Response: Delete “cast-in-place” as the requirement applies to both CIP and precast substructures. Change made.

8. 462-8.2: Second paragraph, third sentence, change the sentence to read “Ensure that the strands will be movable by hand……”

The strands must be able to be moved within the duct easily, by hand, without resorting to excessive effort or mechanical assistance.

Response: Use: “Ensure that the strands are easily moveable within the duct by hand without the need for excessive effort or mechanical assistance.” Change made.

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Comments: (7-12-11)

Reading sections 462-11.4.3 & 462-11.5.5, the use of a pump with 145 psi (min or max) is not clear to me. Is that correct?

Response: 462-11.4.3 requires the pump to be able to maintain a discharge pressure of at least 145 psi. 462-11.4.3 also requires two pressure gauges be used, one at the pump and one at the inlet, if the length of the grout hose exceeds 100 feet. 462-11.5.5 requires that a maximum pumping pressure of 145 psi at the grout inlet not be exceeded. The combination of these requirements allows grout hoses longer than 100 feet to be used, which could necessitate pressures in excess of 145 psi at the pump, as long as the pressure at the grout inlet does not exceed 145 psi. No changes made.

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Comments: (7-14-11)

I have a comment regarding the subject spec. In Article 462-11, a requirement to sound external PT ducts needs to be added to insure that ducts with voids are not left in place once construction is complete. This article should also address how the sounding should be done and what action is required if the sounding reveals problems.

Response: On hold pending further discussion between Rudy, Robert and Charles. No changes made at this time.

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Comments: (7-13-11)

Sec. 462 – 6.2 – In the last sentence of the section. What is **8-6**?

Response: Specifications, Section 8, Article 6.
