

4620000 Post-Tensioning
COMMENTS FROM INTERNAL/INDUSTRY REVIEW

Steven Plotkin, P.E.
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Comments: (5-8-12)

I have begun reviewing these specs and I have observed that the word “the” is not used as it normally would be. In fact, it has obviously been deliberately left out of the text wherever possible. As far as I know, this is not the spec writing convention that all other specs conform to and it is not a standard contract language convention. In order to continue to provide specifications that are written with consistent usage conventions, please consult with your supervisors regarding this unilateral change by the authors of the attached specifications. Do we want to start writing all revisions and new specs with this convention or not? My personal opinion is that eliminating “the” is inconsequential considering that it disrupts the flow of the text and with the advent of electronic specifications just around the corner the savings is even less consequential since the amount of electronic storage saved is minuscule.

Response:

Jeffrey A. Pouliotte
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Comments: (5-21-12)

1. Under 462-1,(b),1, it refers to the approved systems on the website. In light of all the problems we’re having with voids and segregated grout in our existing bridges, consideration should be given to requiring clear duct for external post-tensioning.

Response: The development of 960 and the associated proposed revisions to 462 and 933 are for the most part only a reorganization of existing spec requirements and not a rewrite for technical content. We will take these comments under advisement for future consideration. No changes to the proposed 462, 933 and 960 are required at this time based on the comments. No changes made.

2. Under 462-6.3, it indicates the PT steel is protected by corrosion inhibitor, which must have no deleterious effect on steel or concrete or bond strength of steel to concrete. Despite this requirement, does the corrosion inhibitor need to be wiped off prior to placing it in the ducts? The reason I’m asking the question is that I’m wondering whether the corrosion inhibitor can become dispersed in the grout and affect the functioning of the grout. I know that using corrosion inhibitor is an old practice, but in light of problems we’re having with grout, I’m asking the question.

Response: See response to #1, above.

3. Under 462-6.5, it states “if contamination is discovered, immediately flush duct with potable water per 462-7.2.4 before use.” Recent inspection of PT ducts have revealed sand trapped in the ducts, and there has been some question of whether water can get trapped in the ducts and promote the formation of soft grout that doesn’t set-up. Sub-article 462-7.2.4 states” blow oil-

free compressed air through duct to remove any excess water in duct,” but does not address how to confirm that the ducts are indeed dry and clean. It is unclear to me how to confirm the presence of contamination, how to remove the contamination and how to confirm it has been removed. This may be more of a question for the State Construction Office rather than a specification question, or maybe the specification needs to require the Contractor to submit a plan to deal with these issues.

Response: See response to #1, above.

4. Under 462-7.4.5.1, it states “at inlet end of grout hose, the maximum limit for grout temperature is 90°F for normal grouting procedures and 85°F when performing repair operations with vacuum grouting.” The State Materials Office has found that several of the grout systems formally on the QPL (there are currently no approved grouts on the QPL) start to experience problems (development of trapped air and grout starting to set-up) at grout temperatures of around 90°F. The specification goes on to say “condition grout material to maintain mixed grout temperature below maximum limit,” which is a cryptic way of staying keep grout temperatures at or below 90°F. I think this portion of the specification needs to be strengthened and consideration needs to be given to requiring lower grout temperatures, and requiring the Contractor to submit a plan to control these temperatures.

Response: See response to #1, above.

5. Under 462-7.4.5.4 indicates discharging “a minimum of two gallons of grout from anchorage cap” and there appear to be no volume requirement of grout discharge at other outlets. In light of all the problems we’re having with voids and segregated grout in our existing bridges, consideration needs to be given to adopting European grout procedures that I understand require the discharge of more grout at these locations. Also grout pressure tests and required pressures before and during grouting operations needs to be reconsidered. In general this specification seems to be less prescriptive than the previous specification, which appears to be current Department philosophy. Therefore, it would seem prudent to require the Contractor to submit specific quality control plans to control and inspect the quality of the work.

Response: Response: See response to #1, above.

Previte, John

Comments: (5-23-12)

This looks like a late change that comes off as a little naïve given the current range of media. Signed and sealed already connotes non-verbal or hard copy communication. At best delete “in writing” At worst say “Submit written signed and sealed... Or do we mean ...”Engineer for review and written approval”? (ec) Submit signed and sealed project specific local zone reinforcement details to the Engineer for review and approval *in writing*.

462-2.22.2 Prestressing:

Response:

Karen Byram
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Comments: (5-24-12)

I am requesting that the reference to “Epoxy Grout” in the section 462-2.3 Other Material References to be modified. The correct reference is “Epoxy Compounds “(not grout). Not only is this consistent with the QPL listing but it will help to eliminate confusion with the post-tensioning grout references throughout the specification. Additionally, throughout the document, changes need to be made in the wording from ‘epoxy’, ‘epoxy grout’ and ‘epoxy material’ to ‘epoxy compound’ for the same reasons.

Response:

Richard Kerr
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Comments: (5-30-12)

It appears that Garcon Point may have been the exception to use tie wires around the PT strands for external tendons. Since currently magnetic flux and magnetic leakage appear to be the best NDE technology and the use of tie wires appears to defeat this technology, perhaps the post tensioning specifications should be changed to prohibit the use of tie wires in at least external tendons if not all tendons.

Response: Added the following sentence to 462-7.2.4(n) to remove ties (wire or nylon) prior to stressing. (n) Strand installation aids (i.e. wire/nylon ties around strand bundle, strand spacers, etc.) must be removed prior to stressing.

Womble, Steve

Comments: (5-31-12)

Here are my review comments on Section 462, Post-Tensioning, as requested.

1. In 462-1(a), I suggest modifying the updated final statement to read as follows: "...for protecting components, as determined by the engineer, from damage..."

Response:

2. In 462-1(b) there is a lined-thru item, ~~Approved Post-Tensioning~~, that is simply restated in red. This occurs at various points in the update, and I’m curious as to why.

Response:

3. Same section, subgroup (b)(2), suggest replacing the word “appropriate” with “specific.”

Response:

4. In 462-3(j), the existing wording is “Contractor’s Specialty Engineer,” but the update says “Engineer of Record,” but this is referring to a change in the contract documents. Wouldn’t such a change have been designed by the contractor’s specialty engineer, and later approved by the EOR? The same question is applicable elsewhere.

Response:

5. In 462-6.5, item I is a sentence (has subject and verb), but item (f) is not a sentence if the words “must be” are removed. Same thing elsewhere.

Response:

6. In 462.7.2.3, item I(2) now reads “top of anchorage cap,” but aren’t there grout inlets/outlets at other locations than just anchorages?

Response:

7. In 462-7.3.3.2(a), the word “tendon” is replaced with “strand,” but in other locations this change was not made. So, why is this change proposed here?

Response:

8. Same section, item I, within 28 days of what?

Response:

9. In 462-7.4.4.2(d), the item should read “...to maintain the optimal specified grouting rate.”

Response:

10. In 462-7.4.5.1I, the third line should read “...below 40D F or is expected to...”

Response:

11. In 462-7.4.5.3(f), the last line should read “...operations have ceased...”

Response:

12. In 462-7.4.5.5 (b), insert a comma between the words “drop” and “potentially.”

Response:

13. In 462-8.3.2(d), the item should read “...if drilling of inlets or outlets is not feasible...”

Response:

14. I would expect that both the Structures Office and the Materials Lab have reviewed these proposed changes. If not, they are highly recommended for such a review. Another good review source would be the District Level Construction offices.

Response:

Todd Schille
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Comments: (6-21-12)

In general my comment to this entire system is;

This continues to specify a “grouted” PT system only, which is not fully understood other than when something goes wrong the grout may rapidly corrode the strand.

This specifies using corrugated duct on the interior tendons and continues to mention “flushing” in several sections of the spec. You cannot economically get ALL the water out of these corrugated ducts if you flush and I like to think we know that **any excess water** is a bad thing in a tendon being grouted.

Not having the comments back on vacuum grouting, the sentiments are, that no one in the Industry, that we are aware of, can comply with that specification. Not DSI, VSL or PCL.

Response:

Cheryl Hudson

Comment: (7-2-12) All Cheryl’s comments are incorporated into the spec change following the response page.

Response:
