4570000 – INTEGRAL PILE JACKETS
RESPONSE TO COMMENTS RECEIVED FROM INDUSTRY REVIEW

Bob Dion
386 740-0664

Comments:

'Suggest changing 'cathodic protection jackets' to 'cathodic protection integral pile jackets' in the last sentence of 457-2.2 and the last sentence in the first paragraph of 457-2.4.

457-2.3 requires using an air-entraining admixture in accordance with 924-2.1. 924-2.1 deals with the QPL. Is it your intent to limit use only to QPL items? If not, suggest changing the reference from924-2.1 to either 'section 924' or '924-2'.

The last sentence of the first paragraph of ~~924-4.1~~ 457-4.1 mentions 'Plans and Specifications for the project'. Suggest changing this to 'contract documents', as mentioned in other portions of the specification.'

Response:

1) Agree; Change made as suggested for 457-2.2 and 457-2.4
2) Agree; Change made as suggested for 457-2.3
3) Agree; Change made as suggested for 457-4.1

Thanks for your comments

Previte, John
(813) 519-2676

Comments:

Does the last sentence below say enough about the connection? The connection/connection material needs to pass a measureable current or needs to be detailed in plans?

"wet blasting" is two words

457-*4*3 Construction Methods.

457-4.1 Surface Preparation*: Remove all cracked or delaminated concrete and excavate to a depth of ~~¾~~3/4 to 1 inch behind the exposed reinforcement.* Thoroughly clean all pile surfaces the integral pile jackets will cover of oil, grease, dirt, broken concrete*, marine growth* and any other deleterious material that would prevent proper bonding. Remove all cracked and unsound concrete from the pile and sandblast *Sandblast* all exposed reinforcing steel to SSPC-SP10, near white, per the Society of Protective Coatings, to remove all rust and scale before installing the pile jacket. Clean existing concrete surfaces by sandblasting, **wetblasting**, wire brushing, water laser, or other approved methods which will yield an equivalent result. Do not place the jackets until the pile cleaning has been approved. ***Provide connection to the reinforcement for cathodic protection pile jackets inside the jacket limits unless otherwise specified in the Plans and Specifications for the project.***

Response:

1) The connection methods and materials should be specified in the TSP or plans for cathodic protection in the contract documents. It would be beyond the scope of this spec to address all possible required connections for each cathodic protection or type of pile. However, wording has been added referent to the cathodic protection contract documents for methods and materials of the connections.
2) Wet blasting reworded.

Thanks for your comments

John Danielsen
954-777-4644

Comments:

1. Under 457-1, “in marine environments”. I would remove this since the EOR will determine which pile jacket to use by which pay item he specifies. I do not see a point leaving this determination up to the contractor.

2. General Comment – The Department has for many years used “Structural Pile Jackets” and we have developed a District standard that we use. I would assume that we would use this new specification and provide the CP jacket or non-CP jacket, depending on environment, with the additional reinforcing steel either under a different pay item or as a plan note to include the cost of the reinforcing in the pay item. I see that the current basis of estimates (457-71) has structural option. I suggest that some verbiage about structural jackets (i.e.,structural jackets require the forms to be removed) be provided in this spec.

3. Under 457-4 Construction Methods – second sentence makes no sense – there seems to be a line missing

4. 457-2.2 refers to plans and contract documents for details. Is there a standard drawing that goes with this specification? I hope that each designer does not have to research and develop cathodic protection details.

5. 457-4.1 requires that all cracked or delaminated concrete be removed and excavate to a depth of ¾” to 1” behind the exposed reinforcement. Our current standard structural jacket does no require excavation behind the exposed rebar this since we are placing a reinforcing cage around the jacket. Consider this.

6. Should discuss reinforcing cleaning below water – current spec only states sand blasting.

7. Would suggest that removal of delaminated and cracked concrete be limited to a 15 pound chipping hammer.

8. Will the Basis of estimates be revised to delete epoxy option?

9. Basis of estimates section 457-71 has two cathodic protection systems – will these be detailed in depth in the plans by the EOR or in a Standard? How does a designer chose which to use?

10. District 4 has been using only Drilled shaft concrete (class IV) for the filler for Structural jackets with good results. Epoxy was discontinued as an option many years ago due to poor workmanship issued related to the material and application, which I see was removed. We used Class IV (drilled shaft) concrete so the concrete could displace the water using tremie methods and dewatering not required. This was our preferred method on structural jackets since we has 6 "minimum void around the existing pile and had the room for a tremie. For non-structural jackets the space between the form and the pile may be small and require dewatering to place a grout filler.

Thanks for the opportunity to comment.

Response:

1) Since the spec will be used by designers, it is important to make this statement to avoid misuse of the specification (problem in the past). However, you are correct regarding the statement as a directive to the contractor. Wording has been introduced for the statement to better fit the Section (article) "Description" .
2) This Specification applies to the "Integral Pile Jackets" only (which include the stay-in-place form) and should not affect the jackets you refer to. The jackets you refer to are "structural concrete jackets". These should be specified in the Plans and probably include a TSP, since removable forms are typically required. If we include verbiage to remove the integral forms, voids from the stand-offs will probably remain in the final product.
3) Agree; Sentence broken into two sentences for clarity.
4) The designers should contact the SMO – Corrosion Research Laboratory to determine type of Cathodic Protection as indicated in Chapter 5 of the "Bridge Maintenance and Repair Manual". Chapter 5 of the previously referred publication also includes basic drawings for the designer.
5) This specification is not intended for non-integral pile jackets. Removal of concrete behind existing bars provides a mechanical bond of the new material to the pile. At the same time, the new cement material passivates the entire circumference of the exposed reinforcement.
6) Good observation; Agree; Sentence added to include exposed steel under water.
7) Agree; Added sentence limiting size of hammer to 20 pounds.
8) Good observation. Will request a revision to delete the epoxy pay item.
9) Cathodic protection pile jackets (457-71-) will require a TSP for the cathodic protection part. The SMO assists designers with the selection of cathodic protection as addressed in item 4.
10) Tremie and pumping from the bottom via pumping ports is permitted. Fillers specified are suitable for tremie and pumping from the bottom via pumping ports.

Thanks for your comments

Rick Hogue
RickHogue@wilsonmiller.com
727-864-5585

Comments:

457-4.1 Surface Preparation: Expand the last sentence of paragraph 1 “Provide connection to reinforcement...” by identifying the method of connection (mechanical clamp/welding/brazing/exothermic weld), frequency of connection (xx percent of horizontal / vertical reinforcement, or how many connections per face of pile) and, in the case of structural jackets where a reinforcing steel cage is added, to which elements (existing and/or new steel). Many of these details could be required in the design and use the specification to direct attention to the design detail.
These have all been issues that have arisen on previous pile jacket projects.

457-4.2 Filler Material Placement: Reword the first sentence of last paragraph to place work in sequence and emphasize curing time. “Cure filler a minimum of 96 hours before removing external bracing and banding materials.”

457-4.3 Shop Drawings: Shop drawing submittal and approval precede construction. Recommendation is to make this 457-3 and re-number the remainder of the specification sections.

Response:

1) Connection methods will still need to be addressed in the Plans and TSP for cathodic protection due to the several types of possible installations. Type of connections required is determined in a case by case basis. However, wording has been added to refer to the Contract Documents for these requirements.
2) Agree; Reworded to better follow sequence of work.
3) Agree; Shopdrawings requirement moved to 457-3.2 to better follow sequence of work.

Thanks for your comments

Don Buwalda
don.buwalda@state.dot.fl.us
386-961-7000

Comments:
1. 457-2.2: First paragraph last sentence. Should the galvanic anodes be in direct contact with the existing pile and not the inside face of the jacket.
2. 457-4.1: Last paragraph, last sentence consider adding “Provide multiple connections to the reinforcement……”
3. 457-4.2: 72 hours is allowed to place filler material. Is there a concern of cleaned steel (i.e. SSPC-SP10) to begin rusting.

Response:

1) Galvanic anodes need to be in contact with the inside of the jacket (outside the filler material) to allow for the expansion of zinc oxides and to benefit of the moisture at this location.
2) Wording added to refer to the contract documents for more details of the cathodic protection connections.
3) Some rusting will occur within the 72 hour period but it should be acceptable. It would be impractical to reduce the allowance period from the constructability aspect.

Thanks for your comments

Chris Papastratis/Mayur Patel
(954) 777-4193/(772) 489-7138

Comments:
457-2.2 requires "certified test report" and "manufacturer certification" (two different documents). I propose warranty/ performance criteria should be "method of acceptance" instead of certifications. Traditionally certification requirement has not worked efficiently. Some of the issues associated with the certification requirement are delays, erroneous certs, and certs being non-project-specific (a generic one). At present State Construction Office and Materials Office are looking at this "acceptance" method. I propose the certification requirement should be aligned with the new proposals that would come out as a result of the central office effort.

457-2.4: "*Incorporate only Department approved mixes into the work." Could be more effective if it reads "Use only Department approved mixes."*

457-3: Change to active voice for consistency. See my proposal **(in blue & bold)** below.
Test and accept materials for portland cement grout and Class III *IV* Concrete ~~**shall be tested andaccepted**~~ as required in the *Standard S*specifications *for Road and Bridge Construction**, and Contract Documents for approved design mixes.* ~~***Sampling and testing will be performed by Quality Control technicians meeting the requirements of Section 105.***~~

Test m~~**M**~~*aterials for other cement based fillers allowed under Section 457-2.5* ~~***shall be tested equivalent to the testing***~~ **for properties** *required for the FDOT approved design mixes. Test the materials at a frequency of one set of tests per load of the mixer. For each set of tests, cast three 4 inch by 8 inch cylinders for compressive strength testing at the required test date. The Engineer may adjust the frequency of testing based on consistency of the mixes. Conduct a field verification* **of the** *mix prior to commencing the jacket installation. Cure samples of cement based materials in accordance with ASTM C-31.*

Accept h~~**H**~~*ardened concrete or grout* ~~***will be accepted***~~ *on the basis of strength test results as defined in this specification. Test the laboratory cured samples for compressive strength at 28 days in a laboratory meeting and maintaining at all times the qualification requirements listed in* ~~*Section 6-6*~~*105-6*.

457-4.3: See my proposal **(in blue & bold)** below. It clarifies focus on "obtaining approval prior to work).

457-4.3 Shop Drawings: Obtain approval on shop drawings prior to field installation. *Prepare shop drawings showing locations of standoff spacers, method of fastening jacket form to piling, sealing the form after installation and bracing during placement of material in the annular space between the form and the* ~~***pile and submit for approval before any field installation***~~*. Include details of the access holes, fiberglass caps and construction methods for filling the annular void and capping the pumping ports in the shop drawings for approval.*

Response:

1) At this time we do not have any direction regarding warranty and performance acceptance criteria for this type of work. Will implement if directed by management and after developing performance based acceptance tests.
2) Agree; Change made to 457-2.4 as suggested.
3) Agree; Changes made to 457-3 to use active voice as suggested except for the acceptance criterion paragraph which is not a directive to the Contractor.
4) Retained as was to preserve the sequential order of work. However, wording was added to use active voice.

Thanks for your comments

Anjani Girwarr
(863) 519-2825
anjani.girwarr@dot.state.fl.us

Comments:

1. **Table at bottom of page 2 of 5, in section listed below appears to have no explanation to show relationship to the section in which it was placed. How does it relate to any items within this section (listed below)?**

457-2 Materials.
457-2.1 Forms:
Meet the following physical property requirements:
(a) Water Absorption (ASTM D 570) 1% maximum
(b) Ultimate Tensile Strength (ASTM D 638)* 9,000 psi minimum
I Flexural Strength (ASTM D 5224*790*)* 16,000 psi minimum
(d) Flexural Modulus of Elasticity (ASTM D790) 700,000 psi minimum
(e) IZOD Impact (ASTM D 256) 15 lb/inch minimum (unnotched *specimen*)
(f) Barcol Hardness (ASTM D 2583) 45 minimum
(g) Color: Similar to Federal Color Standard No. 595, Table VIII, Shade No. 36622. The color must be integral in the form material.
** On original specimens whose flat surfaces are not machined to disturb the fiberglass.*

2. **Page 5 of 5 – last sentence below, why was the term "..Plans and Specifications…" used instead of the term "Contract Documents" which was used in other parts of this proposed revision?**

457-*4*3 Construction Methods.
457-4.1 Surface Preparation*: Remove all cracked or delaminated concrete and excavate to a depth of ¾3/4 to 1 inch behind the exposed reinforcement.* Thoroughly clean all pile surfaces the integral pile jackets will cover of oil, grease, dirt, broken concrete*, marine growth* and any 4570000

457 Items
other deleterious material that would prevent proper bonding. Remove all cracked and unsound concrete from the pile and sandblast *Sandblast* all exposed reinforcing steel to SSPC-SP10, near white, per the Society of Protective Coatings, to remove all rust and scale before installing the pile jacket. Clean existing concrete surfaces by sandblasting, wetblasting, wire brushing, water laser, or other approved methods which will yield an equivalent result. Do not place the jackets until the pile cleaning has been approved. *Provide connection to the reinforcement for cathodic protection pile jackets inside the jacket limits unless otherwise specified in the Plans and Specifications for the project.*

Response:

1) The table contains the property requirements of the stay-in-place form described in the paragraph prior to the table. Table was numbered and referred to in the text for clarity.
2) Agree; "Plans and specs" changed to "Contract Documents".

Thanks for your comments

****

Donald VanWhervin, P.E.
(954) 677-7016

Comments:

I have reviewed specification 457 and find it to be OK.
The only concern I have is 457-4.2 which requires that filler material be dropped
no more than 6 feet. Specification 400-7.5 in the SSRBC requires that the unconfined drop be no more than 5 feet.
The general consensus is if the concrete drop is greater than 5 feet you could have segregation of material
Which could potentially cause problems with the finished product as it relates to durability and uniformity.

Thanks.

Response:

Good observation; Maximum drop changed to five feet.

Thanks for your comments
****

Ghulam Mujtaba
352-955-6685
Ghulam.Mujtaba@dot.state.fl.us

Comments:

1-Subarticle 457-2.1- 7th line : The terminology "..without assistance or damage " should be replaced with ".. without any additional support and without any damage…" .
2-Subarticle 457-2.1- Table : The data is shown in the form of a Table. But, it is not Table. The items are shown by (a), (b)……(g). Additionally it on the top of the Table it has mentioned that "Meet the property requirements. It is not clear that the property requirement of which product. Either delete the Table lines or make it Table and provide title. Delete the Letters (a) , (b) , etc
3-Subarticle 457-2.3- 4th line : Change "microsilica" to "Silica fume, meeting the requirements of Section 929".
4-Subarticle 457-2.3- [1]1th line : Change "ASTM C 618" to "Section 929, ASTM C 618…".
5-Subarticle 457-2.4- : Class IV concrete has been specified with slump change. It is not clear if the slump range is with HRWR or without it. Is there going to be any change in w/cm or cementitious materials? Change "microsilica" to "Silica fume".

Response:

1) Agree; Changes made to 457-2.1 as suggested.
2) Agree; Changes made to table in 457-2.1as suggested
3) Agree; Changed microsilica to silica fume in 457-2.3
4) Agree; Reference to Section 929, ASTM 618 included in 457-2.3 as suggested
5) Water reducing agents are allowed as per Section 346 to attain higher slumps and flowability. Changed microsilica to "silica fume".

Thanks for your comments

**

Mike Bergin
352-955-6666
Michael.Bergin@dot.state.fl.us

Comments:

Section 457-2.4. The last sentence in this subsection state", "Submit the design mix for approval before mixing placing any concre"e." The current statement is in conflict since the concrete

cannot be trial batched unless its mixed and’we're not allowing him to mix to design the concrete. Suggest that we chan“e "mixing" “o "placing".

Response:

1) Good observation: Change has been made.

Thanks for your comments