5480000 RETAINING WALL SYSTEMS
COMMENTS FROM INTERNAL/INDUSTRY REVIEW

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Comment: (12-15-10)
1. Section 548-2.3: There are added requirements for reinforcement lengths to be the same from top to bottom. In other states where this requirement has been made, questions come up with how to deal with tiered walls. Reference should be made to address tier walls in a manner similar to how they are treated in NHI (2009) please feel free to contact me if you need a copy. Reinforcements for each tier are dictated by the maximum tension envelope and compound global stability analyses rather than necessarily treating the section as one overall wall height. The basis depends on the setback of each tier.

Response: Agreed. The original language was pulled directly from the PPM. Language has been added to clarify for tiered walls, the backfill reinforcement lengths are the same within the height of each tier at any section.
From the Specifications Office: Change made.

2. Section 548-2.6.2: This section has backfill used in combination with both steel and geosynthetic reinforcements needing to meet a pH range of 5 to 9. The range is a composite and it should actually be broken up between steel (pH of 5 to 9) and geosynthetics (pH of 3 to 10) the same as has been shown in the past.

Response: Point noted. However, no change has been proposed to the content of the Specification regarding these pH ranges. This range is representative of the desired backfill for all projects within this state. The FDOT criteria determining the need for geosynthetic reinforcement is based on the environmental conditions in SDG, Figure 3.12-2. No Change made.

3. Section 548-3: If the scour term is in reference to undermining below the MSE section, then the issue is global stability and not the responsibility of the MSE supplier. The term “scour” needs to be better addressed as far as what is needed.

Response: Agreed, the reference to scour has been removed.
From the Specifications Office: Change made.

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Ray Haverty
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Comments: (12-16-10)
I have reviewed this proposed change and have two comments:
In 548-11 Method of Measurement the term “beginning and end wall limits” is used. Should this read “beginning and ending wall limits” or “begin and end wall limits”?

Response: The sentence has been revised to read “begin and end wall limits”.
From the Specifications Office: Change made.

Second in 548-12

Item No. 548-13- Retaining Wall System (Temporary) – per square . I think this should read

Item No. 548-13- Retaining Wall System (Temporary) – per square foot

Response: Thank you for catching this typo. It has been corrected.
From the Specifications Office: Change made.

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Gregory Weich

Comments: (12-15-10)
Rudy, the first paragraph should be clarified in order to meet the current 105 specifications, this is always the confusing parts for the PA's and job site QC personnel. They are not sure of what to look for on the product or what paperwork they should be receiving. With LAP, CIGP, P3 and other types of projects this seems to a big confusing item. I've highlighted in yellow the only part I recommend you consider to add.

548-1 (second paragraph)

Obtain *each* Precast Concrete Retaining Wall System from an approved Incidental Precast manufacturing plant that is currently on the list of Producers with Accepted Quality Control Programs. Producers seeking inclusion on the list shall meet the requirements of 105-3.

Ensure that each *w*~~W~~all *s*~~S~~ystem *c*~~C~~omponent is permanently and legibly marked by etching on the back of each panel, the panel number or type, project number (when applicable), date cast and manufacturer's name or symbol along with the approved producer's QC stamp affixed.
Ensure that each shipment of products to the job site includes a QC signed shipping ticket list of products shipped ~~and the required written certification statement for each product~~. A notarized certification statement for all products must be received prior to the shipment of products.
Provide ~~this list~~ these tickets and notarized certification(s) to the Engineer.

Response: Agreed. However, this language has been modified with a reference to the Materials Manual to avoid duplication and conflict.

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Comments: (12-15-10)
Test method FM5-550(pH) is mentioned under section 548-2.6.2. Should it be listed under section 548-9.6.6 as well as part of the corrosion series of tests?

Response: Agreed. FM 5-550 has been included under Section 548-9.6.6.
From the Specifications Office: Change made.

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Cheryl Hudson
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Comments: (12-17-10)
1. Perhaps the following should be combined? Suggest adding 548-1, paragraph 3 to 548-5.3.

548-1, paragraph 3:

Ensure that each w~~W~~all s~~S~~ystem c~~C~~omponent is permanently and legibly marked by etching on the back of each panel, the panel number or type, project number (when applicable), date cast and manufacturer's name or symbol.

548-5.3

548-~~3~~5.3 Marking of Precast Components: Clearly mark each precast components with the date of manufacture, the *Section* 346 concrete production LOT number and the piece-mark.

Response: Agreed. 548-1 (paragraph 3) is addressing the jobsite QC personnel and requiring them to check this information to ensure they are receiving the correct product. Section 548-5.3 is addressing the manufacturer of the product to ensure they place the information on the product. The current language requires the jobsite QC personnel to check information that the manufacturer has not been directed to place. The language of each section has been modified to address this issue.

2. 548-3.7(i) meaning is not clear. Is the cutting and 15 degree limit just for grid reinforcement?

i. Details for skewing soil reinforcement (15 degrees maximum) without cutting when grid reinforcement is used;

Response: Agreed. It is applicable to both grid reinforcement and straps. The phrase "when grid reinforcement is used" has been removed.
From the Specifications Office: Change made.

3. 548-~~9~~11 Method of Measurement

The quantity to be paid for will be the plan quantity, in square feet, completed and accepted, of the area bounded by the *following*:

For permanent retaining wall systems: the top of the coping, the top of the leveling pad~~,~~ or top of structural footings, ~~bottoms of walls which do not have footings or leveling pads,~~ and the beginning and end wall limits as shown on the wall control drawings.

For temporary retaining wall systems: the top of wall and the beginning and end wall limits as shown on the wall control drawings.

a). Temporary has no bottom location (top of footing or ground level?).

Response: Agreed. The limit of "ground line" has been added to the sentence.
From the Specifications Office: Change made.

b). Second paragraph, add the word "or".

Response: Agreed. The word "or" has been added.
From the Specifications Office: Change made.

4. 548-~~10~~*12* Basis of Payment: pay item for permanent is per square foot, temporary is per square. Should this also be per square ***foot***?

Response: From the Specifications Office: This was a typo and has been corrected.

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Jeff Stone
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Comments: (12-21-10)
With regards to the proposed FDOT Specification 5480000 revisions we offer the following comments for consideration.

1. 548-2.3 – Backfill Reinforcement – 2nd paragraph:

"Ensure longitudinal and transverse wire are of equal and constant diameter within a given piece of mesh reinforcement."

Historically speaking, AASHTO, Federal Highway Administration and FDOT have allowed the use of dissimilar wire diameter for the transverse and longitudinal soil reinforcement. As a result there are many, many projects constructed throughout the State of Florida and elsewhere throughout the country using different wire sizes without compromising the long term performance of the MSE structures. In previously speaking with individuals with the FDOT Structures Office, they were looking into the matter and considering the removal of the requirement from the plans and preparations manual while revising the statement to allow for some selective dissimilar wire configurations to be used.

Response: Point noted. However, the original language was pulled directly from the PPM. This has been a requirement of the PPM since January 1998. The history/origin of this requirement is not documented; however, it is speculated that this may have been derived from a concern with corrosion rates of the reinforcement. This issue will not be resolved within the scope of this current change but will be investigated further for possible future modification. No Change made.

2. 548-2.3 – Backfill Reinforcement – 3rd paragraph:

"Punch or drill holes before galvanizing".

Generally speaking this addition is acceptable with the exception of bin wall/acute corner situations. Routinely these matters are addressed by providing flat bars/strips being fabricated with one side being punched prior to galvanizing then the actual length being adjusted as required via field cutting and punching the remaining side of the flat bar for installation. As you can envision the tolerance for the back-to-back connection is critical and can only be accomplished via actual field measurements and field fabricating the final/actual length to be installed. Further, this insures the proper length of flat bar is being installed based upon the actual panel placement. Once the actual length is establish and the hole is drilled/punched, any or all exposed steel is then field galvanized (via spray application) with an approved field galvanizing material prior to installation via bolted connection.

Response: Agreed. The original language was pulled directly from the PPM. We recognize geometric issues associated with bin walls and have modified the language to allow for field drilled holes within bin wall sections only.
From the Specifications Office: Change made.

3. 548-8.4 – Wall Erection – 2nd paragraph:

"Do not cut or kink soil reinforcement."

As mentioned above, in acute corner areas, flat bar is routinely field cut to allow for proper placement/installation (based upon actual field conditions). Further, in using bar mat soil reinforcement; it is occasionally required, the transverse wires are selectively cut to insure proper placement around piles and other obstructions (i.e. piles, drainage structures, other vertical obstructions). By cutting the transverse wires it allows for the longitudinal wires to be splayed (maximum of 15 degrees) around vertical obstructions and as indicated within the approved shop drawings. Again, prior to final installation/backfilling any or all exposed steel (resulting from the cut transverse wires) is then field galvanized with an approved field galvanizing material.

Response: Agreed. The original language was pulled directly from the PPM. Changes made to allow field cutting only at locations shown in the approved shop drawings.
From the Specifications Office: Change made.

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Comments: (1-4-11)
1. (Daniel Haldi of D5 M&R)
548-2.6.1 or 2.6.3 … should expand to state use of flowable fill with similar pH properties as backfill or subgrade soil within the immediate area of the retaining wall system. Do not comingle or intermix different layers of flowable fill with soil backfill or vice versa at any volume elevation. Use only one backfill or flowable materials per wall alignment.

Response: The existing language is clear on requirements when flowable fill is used (See Section 548-8.5.2). No Change made.

2. (Tammie Andrews/Orlando Operations)
Similar to the current requirements of Spec. 346-9, fourth paragraph:

> "Test the QC laboratory cured samples for compressive strength at the age of 28 days, or any other specified age, in a laboratory meeting and maintaining at all times the qualification requirements listed in Section 105."

The proposed Spec. should read:

> 548-~~3~~5 Concrete Component Construction.
>
> Construct concrete components in accordance with Section 400. Precast wall components are produced using certification acceptance; therefore, assume responsibility for performance of all quality control testing and inspections required by Sections 346 and 400 for the precast component construction. Perform all Quality Control (QC) inspection and testing using Construction Training and Qualification Program (CTQP) qualified personnel. Perform compressive strength testing in a laboratory *meeting and maintaining at all times the qualification requirements listed in Section 105*~~inspected by the Concrete Reference Laboratory (CCRL), or Construction Materials Engineering Council (CMEC)~~. .....

Response: Agreed. Change made.

3. (Ron Meade of D5 Structures Maintenance. 1-10-11)
548-3. Qualified Products List. Item 7. Provide 11" x 17" drawings showing the following:

I suggest we add:

n. Details showing how this design can be repaired following vehicle impact damage (post construction).

Response: Point noted. Since this is a maintenance issue, information on repair procedures has been forwarded to the State Maintenance Engineer for further consideration. No Change made.

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Comments: (1-5-11)
548-9.6.5 uses the abbreviation LL&PI. It is also used within a table. Where is this abbreviation defined? I didn't see it within the spec.

Response: For clarification, subarticle heading has been changed to “Liquid Limit and Plasticity Index (LL&PI):”

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Stefanie Maxwell
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Comments: (1-5-11)
Modify Article 548-5, fourth sentence, to include "Cement and" Concrete Reference Laboratory (CCRL).....

Response: Reference removed. See above comment by Ken Zinck (Tammie Andrews/Orlando Operations) and the response.

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Katie Bettman
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Comments: (1-5-11)
548-5 Concrete Component Construction states, "Perform compressive strength testing in a laboratory inspected by the Concrete Reference Laboratory (CCRL) or Construction Materials Engineering Council (CMEC)." Why aren't these laboratory requirements the same as the ones in 105-6 Lab Qualification Program? Once inspected, there are additional Department requirements.

Response: Agreed. See above comment number two by Ken Zinck (Tammie Andrews/Orlando Operations) and the response.

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