

5480000 RETAINING WALL SYSTEMS
INTERNAL/INDUSTRY REVIEW COMMENTS

Andy Harper
850-414-4776
Clifton.harper@dot.state.fl.us

Comments: (7-5-16, Internal)

1. Referring to D-2 or D-3 is that all category's, ie D-2 a,b,c,d,e,f, and the same for D-3 a,b,c,d,e,f?

Response:

2. (7-7-16, Industry) In 548-8.3 there is a requirement that states D-2 , D-3 or D-5 be used to wrap the aggregate level. Is this material D-2 (a,b,c,d,e, or f), the same for D-3 material.

Response:

Paul Free
904-730-9777
Paul.Free@stvinc.com

Comments: (7-5-16, Internal)

Note that subsections "f" and "g" are listed twice under section 548-6.1.

Response: This has been corrected.
Change made.

Derwood Sheppard
414-4334
derwood.sheppard@dot.state.fl.us

Comments: (7-6-16)

1. There are a few locations where the Specification refers to the "Contractor's Engineer of Record" and other sections refer to "the Specialty Engineer". If these are the same, I recommend using consistent terminology.

Response:

2. Likewise, the term "Contract" and "Plans" seem to be interchanged throughout.

Response:

3. In Subarticle 548-4, Item 8, remove "No." when referencing Design Standards, Index 286.

Response:

4. For Subarticle 548-5.3, should the APL number also be added to the marking? This is generally a requirement for other APL products.

Response:

Anonymous

Comments: (7-8-16)

Georgia is the only other state that requires a compressible free draining seal between the joints and there has been no observed reduction in vegetation growth in the panel joints. Compressible free draining seals were originally used between the panel joints to keep the backfill in place, after the filter fabric application was introduced the use of the compressible free draining seal was no longer required or added value. Requiring a compressible free draining seal between the panels will add increased material and labor cost with no proven reduction in vegetation growth as the compressible free draining seal does not prevent seeds or spores from being lodged in the panel joints.

Response:

Neil Monkman
239-462-7371
neil.monkman@wrightg.com

Comments: (7-8-16)

The proposed revision contains the following text "Purchase the precast components, soil reinforcement, attachment devices, joint filler, filter fabric, and all necessary incidentals for each wall from the same wall supplier chosen." Is this not dictating means and methods? I believe a more suitable version would be something to the effect of " the contractor will ensure that all precast components, soil reinforcement, attachment devices, joint filler, filter fabric and all necessary incidentals are compatible with each other and do not compromise the integrity of the finished product."

Response:

Greg Strickland
561-291-3459
gstrickland@titanamerica.com

Comments: (7-19-16)

1) Sec 548-1.3. Please clarify what is meant by "mechanical shear connection" between blocks. Can this be a shear connection manufactured into the blocks; like a lip or an external device like a bar, clip or pin?

Response:

2) Sec 548-5.2.2. Sentence 1. and 2. seem to be redundant regarding the individual block tolerance of 1/16'

Response:

3) Sec 548-8.1. Request to change party responsible for the detailed shop drawings from wall supplier to Engineer of record.

Response:

4) Sec-8.4.1.2 Minimum allowable gap of 1/32" between blocks above the first course is unrealistic, 1/8" is recommended. The stated horizontal tolerance over 10' of finished wall of 3/4" is unrealistic; NMCA 3rd edition recommends +/- 1.25" over 10 feet. The stated vertical tolerance over 10' of finished wall of 1/2" is unrealistic; NMCA Segmental Retaining Wall Guide 3rd edition recommends +/- 1.25" over 10 feet.

Response:

Kandarappallil Jose
772-429-4936
Kandarappallil.jose@dot.statge.fl.us

Comments: (7-22-16)

548-2.6.1. Consider adding the language in bold italics following the sentence shown here: Provide flowable fill within the retaining wall volume in lieu of compacted select backfill or coarse aggregate backfill only when the option for flowable fill is shown in the Plans.--- Flowable fill shall be made in lifts not exceeding 6" high up to two third height of individual wall panel.

(The reason for this comment is that if we pour flowable fill in one shot to the entire height of wall panel, the wall panel will get pushed out, unless it is braced and supported from outside to withstand the pressure of the flowable fill. Once it is more than half the height, the sliding resultant force is within the middle third height of the wall panel.)

Response:

Daniel Thiele
402 556 2171
dthiele@thielegeotech.com

Comments: (7-27-16)

Recommend the following edits to accommodate gravity walls constructed using precast modular blocks:

1. 548-1, add paragraph: Gravity walls constructed using precast modular blocks (PMB) may be substituted for MSE walls. PMB units shall have a minimum face area of 5 square feet and a minimum weight of 900 pounds. PMB units may be reinforced or unreinforced, but shall meet all other requirements for reinforced concrete precast units.

Response:

2. 548-2.2, add at the end of the paragraph: ... or welded wire mesh.

Response:

Darren Fouts
678-725-2221
dfouts@earthwallproducts.com

Comments: (7-29-16)

1. 548-8.4.1.2 SBW Systems: Horizontal alignment tolerances must not exceed 3/4 inch per 10 feet of wall length. The maximum allowable gap between segmental retaining wall blocks above the first course must not exceed 1/32 inch. Below per referenced section

Response:

2. 548-5.2.2 you will see that the normal block dimensions must be within 1/16th inch of the specified dimension (same as per the NCMA specification). So if you have two 18” blocks next to each other that are 1/16th inch small, you could have up to a 1/4 inch gap between the block to keep them on running bond. That is ok as long as the gap between the units does not allow the stone used between/ behind the units to come out between the gaps. The 1/32 inch tolerance mentioned above is not achievable with masonry SRW block and would cause problems staying on running bond. To make both sections work, I suggest the 1/32 inch be changed to 1/4 inch to match what is achievable in the field and per NCMA.

Response:

3. 548-5.2.2 Unreinforced Concrete SBW Components: 1. Length, width and height of each individual block must be within 1/16 inch of the specified dimension.

Response:

Dan Tix
651-353-1632
dtix@keystonewalls.com

Comments: (8-2-16)

1. 548-1

Description Item **2. a)** – FLDOT may want to add language similar to AASHTO, “...with vertical spacing of not more than 2x the block depth, or 30 inches whichever is less.” Most block

systems are 8 inches tall, however there are 15 inch tall block systems. The current wording will allow spacing of 16 inches for 8 inch systems and 30 inches for a 15 inch system, for no apparent reason.

Recommend Removing item **2. b)** Comments: SBW systems shall have continuous horizontal reinforcement coverage as stated in item a). AASHTO's basic requirement for geosynthetics is full coverage with no gaps. Partial reinforcement coverage, ie: strip style reinforcement is not recommended when using geosynthetics. The effect of partial reinforcement coverage is not possible to determine in a lab with conventional testing protocols, hence remains somewhat of an unknown.

Response:

2. 548-2 Materials Recommend updating the last sentence in the introduction. "Furnish and install components, soil reinforcement, attachment devices, materials and all necessary incidentals for each wall." Reasoning is that generally it is not in the best interest for contract issuers (DOT's) to have suppliers who do not supply some products within their normal distribution to purchase and markup products. Best pricing comes from contractors who can buy from separate suppliers for each specialized product type, provided those products meet the requirements of your specification.

Response:

3. 548-2.1 Concrete This Section is for wet cast concrete only (reinforced concrete precast panels). A note or sentence should be added to this section indicating that SBW systems are dry cast and shall follow section 548-5 of this specification. (Note: Suggested edits below move portions of 548-5 to 548-2.) Mix designs for the various products will be different for dry cast products than wet cast products.

Response:

4. 548-2.5.1 Horizontal Joint Pads: Recommend adding (for reinforced concrete precast walls only). SBW systems do not utilize joint pads.

Response:

5. 548-2.5.2 Joint Covers: Recommend adding (for reinforced concrete precast walls only). SBW systems do not utilize joint covers.

Response:

6. 548-2.6.2 Compacted Select Backfill: FLDOT may want to consider adding language that resistivity, sulfate and chloride content testing is only required on metallic reinforcement. pH testing is required for all reinforcement types. Sieve chart should indicate that 3-1/2 Inch size is for metallic reinforcement only. Suggest adding an * next to the 3/4" with the following note "3/4" max. when using extensible reinforcement."

Response:

7. 548-2.6.4 Coarse Aggregate Backfill: replace “natural stones” with “crushed gravel or stone from natural sources”

Response:

8. 548-3 Approved Product List (APL)

a. Opening Paragraph: What is “independently certified test reports” referring to? The labs that perform these tests issue reports signed by a PE, is this sufficient?

Response:

b. What is section 6? Referencing this document or separate document?

Response:

c. **Item 7. M)** Added (Metallic Only) Portions of sections 6 and 7 pertain to metallic reinforcement only, should this be clarified?

Response:

d. **Item 8,** we recommend the following changes: “Pull-out test data for the proposed wall reinforcement in soil, and size and type of soil reinforcement for wall system. Testing shall be completed by an independent soil testing laboratory or testing agency. Ensure test data includes all sizes and types of soil reinforcement to be utilized on Department projects. Default AASHTO values may be used for conventional soil reinforcement. For soil reinforcement grids, include all various configurations and combinations of longitudinal and transverse wires.” The purpose here is to separate pull out testing of reinforcement in soil, versus the connection. Also, it does not seem likely that FDOT desires to be in the business of “Certifying” testing labs.

Response:

e. **Add new item 9,** following 8 above, which would be a revised version of section 548-4 Shop Drawings Item 9. “For SBW systems include the results of short and long term connection capacity testing. Tests must be performed in accordance with ASTM D6638 to determine the short-term ultimate connection strength reduction factor (CRu), and the long-term connection strength reduction factor (CRcr) value as determined by Appendix A of Elias et al. (2001). As referenced in section 11.10.6.4.4b of AASHTO 2104 LRFD Bridge Design Manual with 2016 interims. The design calculations for each wall shall include these values in the calculations for each wall height increment noted in the shop drawings.” Comments: Requiring long term creep connection testing is an important distinction. Long term connection testing requires a significant investment in money and time. There are about 8 to 10 SBW systems that have completed this testing. These 8 to 10 systems are supported by companies that are serious players in the structural wall market and are the industry leaders in this segment. Allowing default long term connection values to be used for design will open up FDOT to in excess over 35 to 40 systems, including systems that are not necessarily proven over time to be fully

supported and adept at designing and supply the type of structures needed by FDOT. Current No. 9 & 10 would now become No. 10 & 11.

Response:

9. 548-4 Shop Drawings Remove item 9 from this section and place as new item 9 in section 548-3, as noted above.

Response:

10. 548-5.2.2 Unreinforced Concrete SBW Components Revise to item 1: “Length and width of each individual block must be within 1/8” of specified dimension, except for split face. Hollow units must have a minimum wall thickness of 1-1/4”. “ Comments: AASHTO states length and width dimensions to be 1/8” tolerance, not a 1/16”. Height is covered under item 2, which should be 1/16”. Also, consider moving this section to Section 548-2.

Response:

11. 548-8.4 Wall Erection

a. Second paragraph remove sentence “A one-inch gap between the first course of facing units is allowed, provided a suitable filter fabric is placed behind the foundation units as specified by the Contractor’s Engineer of Record.” Gapping of units is not a good design and construction practice.

Response:

b. Fourth paragraph, add to last sentence. “The shim thickness per course of block must not exceed 1/8” and shall not be installed on reinforcement elevations.”

Response:

12. 548-8.4.1.2 SBW Systems Replace 1/32” with 1/4”. 1/32 tolerance is too stringent. Contractors will not be able to meet that requirement, nor is it necessary.

Response:

13. 548-8.5.1 Compacted Select and Coarse Aggregate Backfill: Third paragraph near the end of the paragraph. Replace 6 inches with 8 inches. Sentence will read the following: “Ensure that the maximum lift thickness after compaction does not exceed 8 inches.” Contractors work in 8” lift increments (block coursing), and would still fit AASHTO lift thickness requirements. Also, given the quality of backfill specified, obtaining compaction in an 8” lift is typically not an issue.

Response:

14. 548-9.4.1 Optional Acceptance Criteria for A-3 and A-2-4 Materials See revision notes for 548-8.5.1, replace 6 inches with 8 inches.

Response:

Bryan Jennings
616-261-8630
bjennings@tegcivil.com

Comments: (8-2-16)

1. 548-2.6.2, paragraph 2: The requirement for 3 inches of concrete cover over the panel reinforcement in low pH backfill environment is not in agreement with the MSE Retaining Wall Classification Table in Std Index 6020 and the Structures Design Guideline Section 3.12C.3.e. The SDG defines the Wall Type by proximity to water levels with a high chloride content or to a source releasing air contaminants. The Table on Index 6020 listing the Wall Types dictate concrete cover (2” for 2A & 2B / 3” for 2C thru 2F). pH levels do not dictate the Wall Type in the Structures Design Guideline or Retaining Wall Classification. Contract Plans for Wall Types 2A and 2B with 2” of concrete cover would preclude the use of backfill material with pH between 3 and 5.0. The panel thickness should be specified in the contract plans per the Structure Design Guidelines and not be changed as a function of the backfill pH as determined by FM-5-550.

Response:

2. 548-1, fifth paragraph: “When shown in the plans or approved by the engineer...” Does this mean approved by the engineer prior to bid or after the bid?

Response:

3. 548-2.6.1, fourth sentence: “The retaining wall volume is defined to extend from the top of the leveling pad or footing, or bottom of walls which do not have footing or leveling pads, to the finished grade line”... Is this correct? Where is “the finished grade”? Is this the top of the wall? We think of the finished grade as the final ground line in front of the wall & not the top of the wall.

Response:
