TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO. ___

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2013	70004-1291-94	3
CONST	2014	BR-NH-40(16)	11B

Site Preparation

1. Trees, stumps, root balls, brush, topsoil, water-softened soil, other undesirable materials and the existing rip rap shall be stripped and grubbed from the existing roadway side slopes and disposed of off-site. Trees, stumps and root balls shall be completely grubbed.
2. In existing pavement areas, the asphalt and base stone shall be excavated and disposed of off site.
3. Soils present in proposed pavement subgrade areas shall be proofrolled to locate pockets of soft or unstable soils. Proofrolling shall be performed using a fully loaded dump truck or other heavy equipment approved by the engineer. Multiple passes of the proofrolling equipment shall be observed by the geotechnical engineer who can provide recommendations should soft or unstable soils be encountered.
4. After completion of mass grading, the top one foot of roadway subgrade soils shall be scarified and re-compacted to 100 percent of the standard Proctor maximum dry density. The moisture content should generally be within two percent of the optimum moisture content, depending on the shape of the Proctor curve. These areas shall be re-worked after the area is excavated to grade and proofrolled.

Class C Rip Rap Fill Placement

5. As specified in Section 205.03, paragraph 6 of the TDOT Standard Specifications for Road and Bridge Construction, 2006, benches shall be cut into the sides of existing hillsides and slopes inclined at 4H:1V or steeper where fills are to be constructed. These benches shall be at least 10 feet wide and shall be sloped down toward the existing slope face. A typical benching detail is shown on the Special Notes and Specifications, Details and Graphs Sheet.
6. After completion of benching, Type IV geotextile (TDOT Item No. 740-10.04) shall be placed over the slope and benches. The geotextile shall extend to the limits of fill placement which will require placement in Lake Ocoee.
7. After installation of the geotextile, a one foot thick interval of No. 1 stone shall be placed over the geotextile.
8. The Class C rip rap shall then be placed over the No. 1 stone by fanning it out into the water using a small bulldozer such as a Caterpillar D6, or by placing the rock using a large trackhoe. Once the Class C rip rap is just above the water level, a bulldozer shall repeatedly traverse the rip rap to densify the material. Once above the water level, the Class C rip rap shall be placed in level lifts using a bulldozer and compacted as previously described. The Class C rip rap shall be placed up to an elevation of 840 feet, then placement shall be halted for 90 days to allow primary settlement to occur. See Notes 14, 15 and 18 through 22 for additional details.
9. The Class C rip rap shall consist of solid, non-degradable rock varying in size from 5 inches to 3 feet. No more than 20 percent by weight shall be less than 9 inches. The materials shall be roughly equi-dimensional in shape. Thin, slabby material will not be accepted.
10. After the completion of fill placement, the Class C rip rap below the pavement shall be capped with a minimum of one foot of No. 57 stone.
11. Type IV geotextile (TDOT Item No. 740-10.04) shall be placed between the Class C rip rap and No. 57 stone.
12. If driven steel H pile foundations are chosen for the bridge, columns of ASTM D 448 No. 57 stone shall be constructed at each driven pile foundation location as the Class C rip rap embankment fill is placed to allow the piles to be driven in the rip rap embankment.

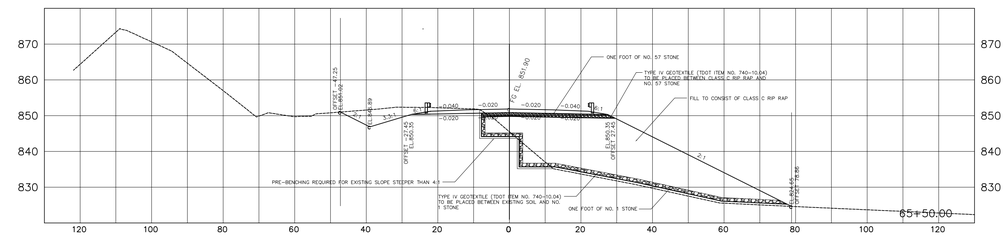
Slopes

13. A maximum slope inclination of 2H:1V shall be constructed for the planned Class C rip rap roadway fill slopes right of the roadway centerline.
14. The slope stability analyses indicate a safety factor of about 1.1 for total stress conditions which is below TDOT's acceptable criteria. To address the short term or total stress stability concern, the planned fill shall be constructed in two stages. Fill placement shall be halted for 90 days after the fill has been placed to an elevation of 840 feet. Fill placement shall resume after the criteria described in Note 22 has been met.
15. After the Class C rip rap fill has been placed to an elevation of 840 feet and again after the completion of fill placement, settlement points shall be established along the crest of the fill slope at the approximate locations shown on the Boring and Settlement Monitoring Point Location Plan and Boring Profile Sheet. The settlement points shall be monitored as described in Notes 19 through 21.

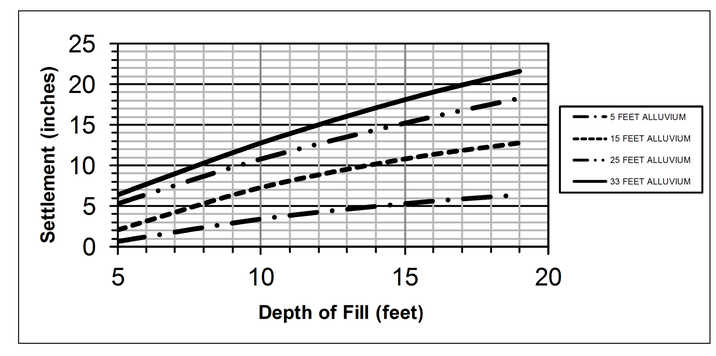
Settlement

16. Settlement calculations for this project indicate up to about 24 inches of total settlement should be expected. The consolidation test data indicates about 10 percent of the estimated settlement will be immediate and will occur as the fill is placed. Graph 1 on the Special Notes and Specifications, Details and Graphs Sheet, which depicts the consolidation settlement that will remain after the immediate settlement has occurred, can be used along with the Test Boring Records to estimate consolidation settlement at various locations along the project length.
17. Our analyses indicate about 50 percent of the consolidation settlement will occur within about 2 ½ months of the completion of fill placement, and about 95 percent will occur within about 14 months of fill placement completion.
18. Settlement shall be monitored by spray painting settlement points along the rip rap slope crest after fill has been placed to an elevation of 840 feet, and again after the completion of fill placement. The monitoring points shall be clearly marked and protected from foot, equipment and vehicular traffic. The monitoring points shall be painted at the approximate locations shown on the Boring and Settlement Monitoring Point Location Plan and Boring Profile Sheet.
19. The monitoring points shall be monitored using conventional surveying techniques from a reference located outside the area influenced by the fill.
20. A professional surveyor shall establish the vertical and horizontal control required to accurately locate the monitoring points and provide this information to the geotechnical engineer. Surveying will be required throughout the monitoring program to determine the settlement at each location. The elevation data shall be provided to the geotechnical engineer within 24 hours of the time of collection. The accuracy of the survey for the monitoring points and benchmarks shall be within +/- 0.01 feet in the vertical direction and +/- 0.5 feet in the horizontal direction. All of the work necessary to accomplish Note 20 is to be paid for under Item 105-01.
21. After the fill has been placed to an elevation of 840 feet and again after the completion of fill placement, elevation data for the monitoring points shall be collected weekly by a professional surveyor. The location, date, time, and elevation of each point shall be recorded. The survey data shall be reviewed and evaluated by the geotechnical engineer.
22. After the fill has been placed to an elevation of 840 feet, the geotechnical engineer shall determine that primary settlement is approaching completion as indicated by the monitoring point survey data. After approval by the geotechnical engineer, fill placement shall resume.

BENCHING DETAIL
(SCALE: 1" = 20')



GRAPH 1 - ESTIMATED CONSOLIDATION SETTLEMENT



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3/12/2014
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STATE OF TENNESSEE

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

SPECIAL NOTES
AND SPECIFICATIONS,
DETAILS AND GRAPHS

STATE ROUTE 40
US 64
BRIDGE AND APPROACHES
OVER MADDENS BRANCH
BRIDGE I.D. NO 70SR0400011
POLK COUNTY
2013