

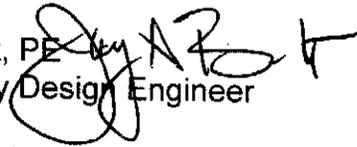


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

MEMO TO: Roadway Design Project Engineers and Division Design Engineers

FROM: Jay A. Bennett, PE 
State Roadway Design Engineer

DATE: October 7, 2010

SUBJECT: Aggregate Subgrade Provision and Guidance for Shallow Undercut
Quantities in Final Roadway Design Plans

The purpose of this memorandum is to provide updated guidance regarding the Aggregate Subgrade Provision information dated October 9, 2009. Engineers should incorporate the following information for any project with aggregate subgrade and/or shallow undercut.

Earthwork Balance Sheet: Quantities for Shallow Undercut and Class IV Subgrade Stabilization will be provided to Roadway Design (or the engineer in charge) in the Geotechnical Recommendations by specifying a station range and/or a quantity as a contingency item. Shallow Undercut is a separate pay item from Undercut Excavation and should not be referenced in the Undercut column in the body of the earthwork balance sheet. The quantities of Shallow Undercut and Class IV Subgrade Stabilization will be shown as separate line items below the grand total of the earthwork balance sheet. An example of the earthwork balance sheet with these items is attached and the balance sheet template on the roadway web page has been updated. The Roadway Design website has also been updated with more detailed information and help on calculating the excavation and stabilization quantities.

CADD Drawings: Shallow undercut listed by a station range shall be shown on our cross sections (shaded and not cross hatched) and shall be shown on the typical sections. Shallow Undercut will not be shown on the profile. Note: standard undercut should always be shown on the profile, even if undercut areas do not cross the center-line of divided or undivided facilities.

Cross Sections: Levels, cells, and input files have been developed for Roadway to draw shallow undercut on the cross sections. An input file has been created to calculate the volume of the shallow undercut (located in our workspace named "suc.inp"). This calculated shallow undercut volume will be used in lieu of the quantity provided by the Geotechnical Engineering Unit. If the calculated quantity differs greatly from the quantity provided by the Geotechnical Engineering Unit, the Roadway squad leader should inform

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the Regional Geological Engineer that the shallow undercut quantities differ. The input file will also calculate a new tonnage of Class IV Subgrade Stabilization, which will supersede the quantity of Class IV Subgrade Stabilization provided by the Geotechnical Engineering Unit. Please note that for the final estimate of quantities, the contingency quantities of Shallow Undercut and Class IV Subgrade Stabilization may need to be added to the calculated quantities to determine the total Shallow Undercut and Class IV Subgrade Stabilization required. Also, calculation of quantity sheets should be created for both the Shallow Undercut and Class IV Subgrade Stabilization. The undercut log file will also contain these quantities.

Typical Sections: An inset (graphic cell) for the typical section has been created for placement on projects that require aggregate subgrade. This inset will list the station ranges and will be edited to show the shallow undercut thickness recommended from the Geotechnical Recommendations. The letter codes of the Pavement Schedule have been revised to include Class IV Subgrade Stabilization (L2) and Fabric for Soil Stabilization (N2). The Roadway Design Manual will be revised to reflect these changes. An example of the pavement schedule changes is attached.

Form Letters: In order for Pavement Management to review the aggregate subgrade recommendations, half size copies of the title sheet and typicals will be sent to the Pavement Management Unit (PMU) at the Combined Field Inspection (CFI) or the Pre-Let Field Inspection (PLFI). The field inspection form letters have been updated to include this change and the Printing Unit Supervisor will make the appropriate copies for delivery. Note: due to the fact that numerous pay item quantities and recommendations are provided in the Geotechnical Recommendations for Pavement Design, Geotechnical has moved Roadway Design from the "cc:" list to the "To:" list with the Pavement Management Unit to place more emphasis on these quantities. The Pavement Management Unit has also added the following statement to their Final Pavement Design memorandum:

"See Geotechnical Recommendations for Pavement Design dated for additional recommendations, quantities and details."

The Roadway Design Unit (or engineer in charge) is responsible for incorporating these recommendations and/or pay item quantities into the final plans, specifications and estimate package. If you have any questions in regard to these recommendations, please contact Glenn Mumford, PE, at 919-250-4016.

JAB/jam
Attachments

cc: Randy Garris, PE
Njoroge Wainaina, PE
Judy Corley-Lay, Ph.D., PE
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Cynthia Perry, PE
Larry Strickland
Frankie Draper