Thomas

Roadway Design Staff Meeting Roadway Design Unit Conference Room October 7, 2010 9:00 a.m. till 11:00 a.m.

12/22/10

Value Management Program (VMP) - Jeff Garland, PE

It is the policy of the NCDOT to design, construct and maintain the State Highway System in the most cost-effective and efficient manner possible. The systematic application of value engineering principles and methodologies in project development, construction, traffic operation, maintenance, and other appropriate areas are major components in the Department's overall effort to reduce costs and improve value and quality.

The Value Management Program (VMP) currently consists of four major program areas which are (1) conducting and facilitating Value Engineering (VE) studies for transportation projects, (2) processing Value Engineering Proposals (VEP's) submitted by Contractors, (3) managing the Product Evaluation Program (PEP), and (4) managing the Resource Conservation Program (RCP). In addition, the VMP is currently working towards incorporating conducting and facilitating Risk Assessments and Road Safety Audits for projects, conducting Constructability Reviews prior to construction of the project, and performing Post Build Evaluations after project construction is complete.

The earlier value engineering is applied, the greater the potential for savings. Care must be taken to ensure that the project is ready and the appropriate information is available to perform the study.

Aggregate Subgrade Provision and Guidance for Shallow Undercut Quantities-Jay A. Bennett, P.E.

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. An example of the roadway web page has 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 shown on our 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.

Typical Section: 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.

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).

<u>Proposed Right of Way, Permanent Utility Easement and Utility Pole/Fixed Object</u> <u>Placement</u> - Jay A. Bennett P.E.

This is to serve as updated technical guidance regarding proposed Right of Way (R/W), Permanent Utility Easement (PUE) and utility pole/fixed object placement but not limited to Transportation Improvement Program (TIP) projects. As noted in the 2006 AASHTO Roadway Design Guide, motor vehicle crashes with utility poles account for approximately 10% of all fixed object crashes. It is therefore prudent to put utilities underground or place utility poles as far away from the roadway edge as is feasible.

The project footprint, construction method, operation and maintenance are things to be considered when setting proposed R/W. The clear zone and recovery area as defined by the 2006 AASHTO Roadside Design Guide should also be considered when setting proposed R/W. The Proposed Design Criteria sheet created by the roadway designer for each TIP project will list the appropriate clear zone.

Site specific constraints such as insufficient R/W available, prohibitive slopes and other factors may make implementation of the full clear zone unfeasible. In such cases good engineering judgment should be used.

Performance Dashboard and Appraisal - Jay A. Bennett, P.E.

Interim Performance Reviews for the Unit's Performance Dashboard and Appraisal cycle ending 03/31/11 are to be completed for all employees by December 23, 2010.

12/28/10 Minutes Approved By : Date: A. Bennett, PE State Roadway Design Engineer



North Carolina Department of Transportation Quality Enhancement Unit Value Management Services Group



Information provided at the Roadway Design Unit Staff Meeting on 10/07/10

Value Management Program (VMP) Overview

It is the policy of the NCDOT to design, construct and maintain the State Highway System in the most costeffective and efficient manner possible. The systematic application of value engineering principles and methodologies in project development, construction, traffic operation, maintenance, and other appropriate areas are major components in the Department's overall effort to reduce costs and improve value and quality. The VMP establishes a systematic program for statewide administration of value engineering techniques and value cost management.

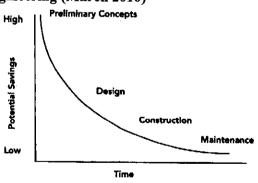
The VMP currently consists of four major program areas which are (1) conducting and facilitating VE studies for transportation projects, (2) processing Value Engineering Proposals (VEPs) submitted by Contractors, (3) managing the Product Evaluation Program (PEP), and (4) managing the Resource Conservation Program (RCP). In addition, the VMP is currently working towards incorporating conducting and facilitating Risk Assessments and Road Safety Audits for projects, conducting Constructability Reviews prior to construction of the project, and performing Post Build Evaluations after project construction is complete.

History of Value Engineering requirement for NCDOT projects

In 1995, Congress passed the National Highway System (NHS) Designation Act which included a provision requiring the Secretary to establish a program that would require States to carry out a VE analysis for all Federal-aid highway funded projects on the NHS with an estimated total cost of \$25 million or more. On February 14, 1997, the Federal Highway Administration (FHWA) published its VE regulation in part 627 of title 23 of the Code of Federal Regulations that formally established the program.

From the AASHTO Guidelines for Value Engineering (March 2010)

For optimum results, value engineering should be applied as early as possible in the project development or design process so that accepted VE recommendations can be implemented without delaying the progress of the project. By proper timing and planning, the value engineering manager can usually ensure specific VE studies can be accomplished without conflicting with the project schedule. In fact, the earlier value engineering is applied, the greater the potential for savings. Care must be taken to ensure that the project is ready and the appropriate information is available to perform the study.



Phased VE Study Process:

The VMP has identified four potential primary windows of opportunity for a VE Study to be performed. A project may be studied at any or all of the four stages. However, the Main VE Study conducted between CP 4A and CP 4B is required for all TIP projects on the VE Studies List.

- VE Study Window 1 Planning Stage 1 Between Scoping Meeting and CP 1
- VE Study Window 2 Between CP 1 and CP 2
- VE Study Window 3 Main VE Study Between CP 4A and CP 4B (required for all projects)
- VE Study Window 4 Constructability Reviews -- Between CP 4C and Finalizing the Permit

For ANY questions at all, don't hesitate to contact the State Value Management Engineer Jeffrey M. Garland, P.E. at 919-508-1872 or jgarland@ncdot.gov.



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 Try A Control of 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 <u>balance sheet template</u> 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

MAILING ADDRESS: NC DEPARTMENT OF TRANSPORTATION ROADWAY DESIGN UNIT 1582 MAIL SERVICE CENTER RALEIGH NC 27699-1582

TELEPHONE: 919-250-4016 FAX: 919-250-4036

LOCATION: CENTURY CENTER COMPLEX BUILDING A 1000 BIRCH RIDGE DRIVE RALEIGH NC

WEBSITE: WWW.NCDOT.ORG/DOH

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 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.

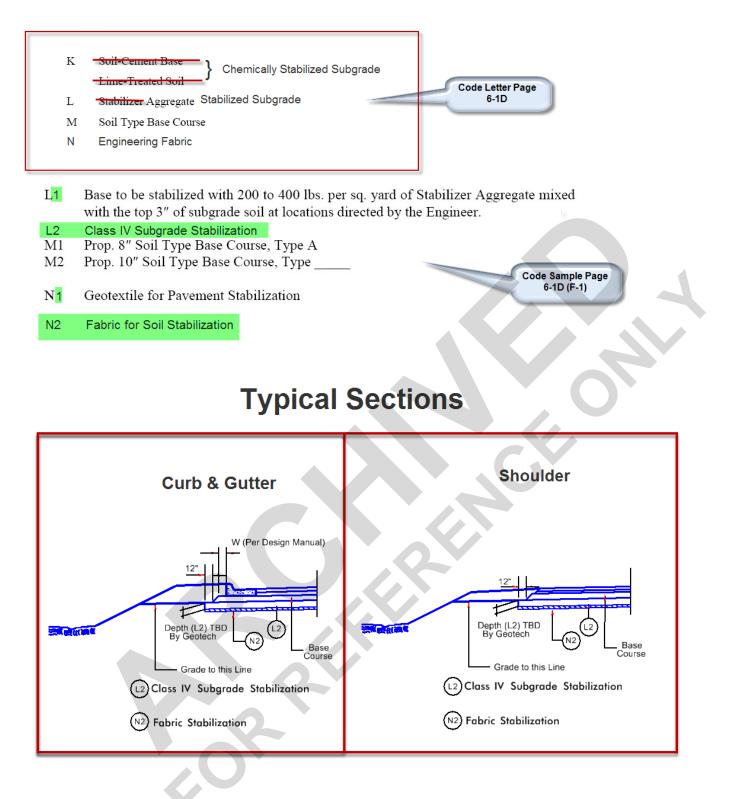
Form Letters: In order for Pavement Management to review the aggregate subgrade recommendations, half size copies of the title sheet and typicals will be sent to the Pavement Management Unit (PMU) at the Combined Field Inspection (CFI) or the Pre-Let Field Inspection (PLFI). The field inspection form 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:

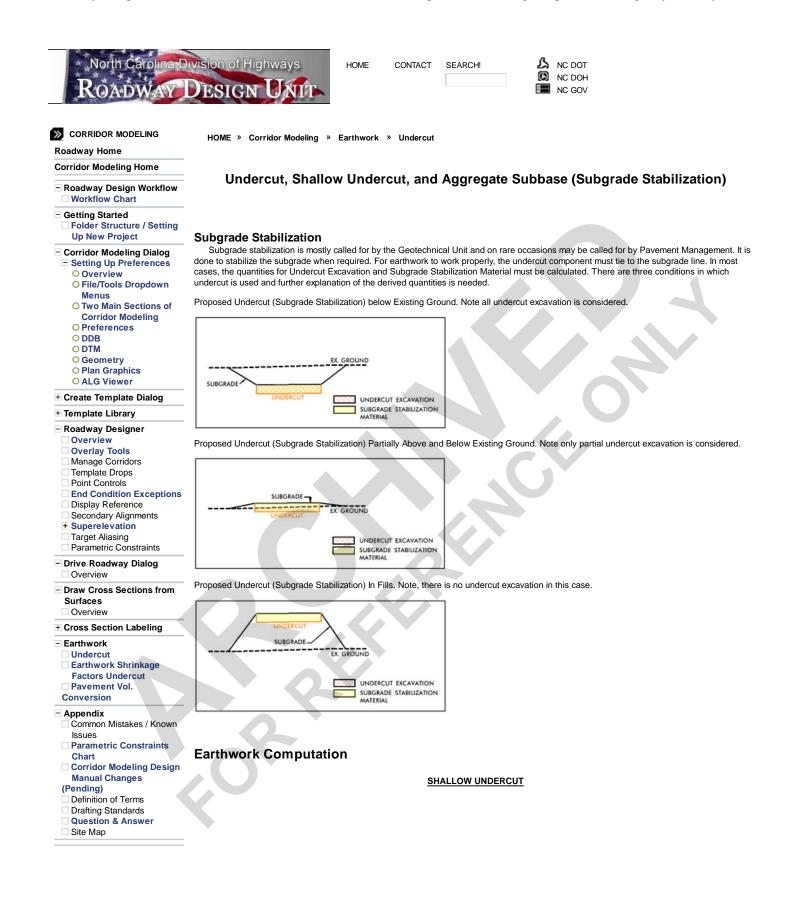
"See Geotechnical Recommendations for Pavement Design dated for additional recommendations, quantities and details."

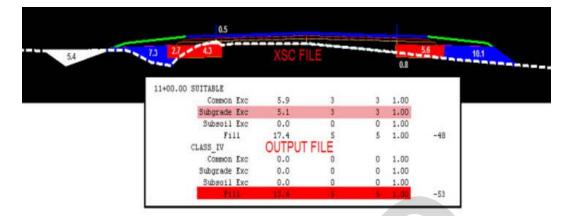
The Roadway Design Unit (or engineer in charge) is responsible for incorporating these recommendations and/or pay item quantities into the final plans, specifications and estimate package. If you have any questions in regard to these recommendations, please contact Glenn Mumford, PE, at 919-250-4016.

JAB/jam Attachments

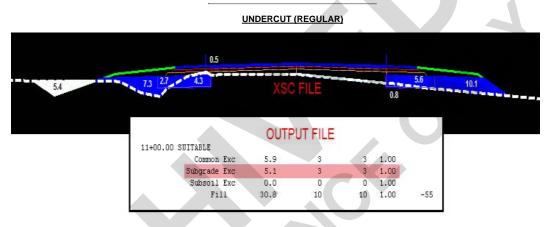
cc: Randy Garris, PE Njoroge Wainaina, PE Judy Corley-Lay, Ph.D., PE Clark Morrison, Ph.D., PE Rodger Rochelle, PE Cynthia Perry, PE Larry Strickland Frankie Draper



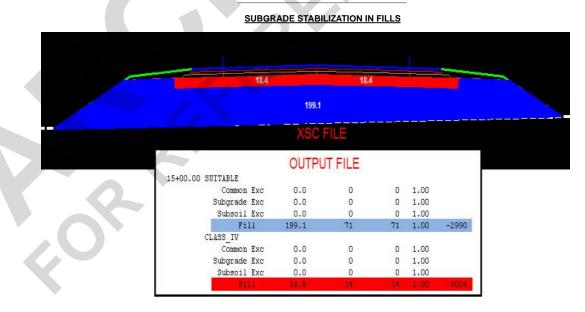




(Suitable) Subgrade Excavation - The amount of shallow undercut excavated (shown in red shapes as excavation only). (Class IV) Fill - The amount of Class IV material to be backfilled (shown in red shapes).



(Suitable) Subgrade Excavation - The amount of undercut excavated (shown in blue shapes as excavation only). (Suitable) Fill - Include earth material to be backfilled of undercut (shown in blue shapes).



(Suitable) Fill - Amount of earth material required for roadway embankment(shown in blue shapes). (Class IV) Fill - Amount of subgrade stabilization material in fills (shown in red shapes).



The North Carolina Department of Transportation







HOME » Corridor Modeling » Appendix » Pavement Conversion

* Includes 1.5 depth compaction factor.

- O DDB
- O DTM
- Geometry
- O Plan Graphics
- O ALG Viewer
- + Create Template Dialog

+ Template Library

- Roadway Designer
- Overview
- Overlay Tools
- Manage Corridors
- Template Drops
- Point Controls
- End Condition Exceptions
- Display Reference
- Secondary Alignments
 Superelevation
- Target Aliasing
- Parametric Constraints
- Drive Roadway Dialog
 Overview
- Draw Cross Sections from Surfaces
- Overview
- + Cross Section Labeling
- Earthwork
- Undercut
- Earthwork Shrinkage Factors Undercut
- Pavement Vol.
- Conversion
- Appendix
- Common Mistakes / Known Issues
- Parametric Constraints
- Chart
- Corridor Modeling Design Manual Changes
- (Pending)
- Definition of Terms
- Drafting Standards
 Question & Answer
- Site Map

Міх Туре	Rate (lbs/yd ² ⋅ in)	Conv. Factor (ton/yd ³)
Surface		
S4.75A	100	1.800
SF9.5A	110	1.980
S9.5B	112	2.016
S9.5C	112	2.016
S9.5D	112	2.016
S12.5C	112	2.016
S12.5D	112	2.016
Intermediate		
I19.0B	114	2.052
I19.0C	114	2.052
I19.0D	114	2.052
Base		
B25.0B	114	2.052
B25.0C	114	2.052
PADC, P-57	90	1.620
PADC, P-78M	90	1.620
ABC		2.025*

Rate for Class IV Subgrade Stabilization 2.025 tons/CY



The North Carolina Department of Transportation



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE GOVERNOR

EUGENE A. CONTI, JR. Secretary

MEMO TO: Jay A. Bennett, PE and Dewayne L. Sykes, PE

FROM: Art McMillan, PE State Highway Design Engineer

DATE: September 29, 2010

SUBJECT:Proposed Right of Way, Permanent Utility Easement and
Utility Pole/Fixed Object Placement

The purpose of this memo is to serve as updated technical guidance regarding proposed Right of Way (R/W), Permanent Utility Easement (PUE) and utility pole/fixed object placement along but not limited to Transportation Improvement Program (TIP) projects. As noted in the 2006 AASHTO Roadside Design Guide, motor vehicle crashes with utility poles account for approximately 10% of all fixed object crashes. It is therefore prudent to put utilities underground or place utility poles as far away from the roadway edge as is feasible.

The project footprint, construction method, operation and maintenance are things to be considered when setting proposed R/W. The clear zone and recovery area as defined by the 2006 AASHTO Roadside Design Guide should also be considered when setting proposed R/W. The Proposed Design Criteria sheet created by the roadway designer for each TIP project will list the appropriate clear zone. The following are typical applications when setting proposed R/W, PUE and placing utility poles/fixed objects:

Shoulder Section with Full Control of Access (C/A)

Proposed R/W with C/A should be set at a dimension that includes the project footprint and encompasses the clear zone as defined by the 2006 AASHTO Roadside Design Guide. All new or relocated utility poles shall be placed outside the proposed R/W and C/A. Please see the attached sketch.

Shoulder Section with no or partial C/A

Proposed R/W should be set at a dimension that encompasses the project footprint and the clear zone as defined by the 2006 AASHTO Roadside Design Guide. All new or relocated utility poles shall be placed outside the clear zone, but not necessarily beyond the proposed R/W. A PUE may be provided beyond the proposed R/W to encompass the utility poles and preferably along only one side of the highway. Please see the attached sketch.

TELEPHONE: 919-250-4016 FAX: 919-250-4036 LOCATION: CENTURY CENTER COMPLEX BUILDING A 1000 BIRCH RIDGE DRIVE RALEIGH NC

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Jay Bennett & Dewayne Sykes September 29, 2010 Page 2

Curb and Gutter Section

Proposed R/W should be set at a dimension that encompasses the berm and protects the clear zone. For a curb and gutter section posted at 45 mph, the clear zone is defined as12 feet. All new or relocated utility poles shall be placed at or just outside the R/W and consequently beyond the 12 foot clear zone. For a curb and gutter section posted at 35 mph, the clear zone is defined as10 feet. All new or relocated utility poles shall be placed at or just outside the R/W and consequently beyond the 10 foot clear zone. For a curb and gutter section posted at 25 mph, the clear zone is defined as 8 feet. All new or relocated utility poles shall be placed at or just outside the R/W and consequently beyond the 10 foot clear zone. For a curb and gutter section posted at 25 mph, the clear zone is defined as 8 feet. All new or relocated utility poles shall be placed at or just outside the R/W and consequently beyond the 8 foot clear zone. A PUE may be provided beyond the proposed R/W to encompass the utility poles and preferably along only one side of the highway. Please see the attached sketch.

Site specific constraints such as insufficient R/W available, prohibitive slopes and other factors may make implementation of the full clear zone unfeasible. In such cases good engineering judgment should be used. Relocated and new utility poles should be placed as far as practical from the roadway, consistent with other fixed objects along the subject road. The Proposed Design Criteria sheet created by the roadway designer for each TIP project will list the appropriate clear zone. During the planning stages for TIP projects, consideration should be given to the need for additional R/W and PUE for the placement of utility poles.

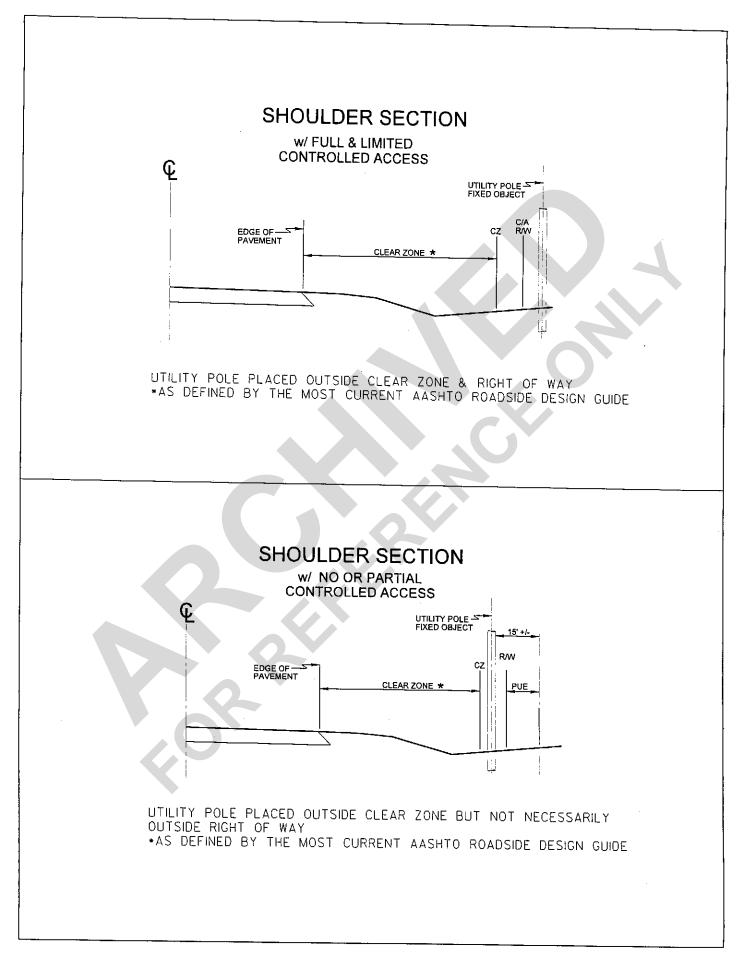
Please begin using these guidelines immediately on all TIP and other applicable projects. If you have any questions, please contact Dewayne Sykes at (919) 250-4128 or Jay Bennett at (919) 250-4016.

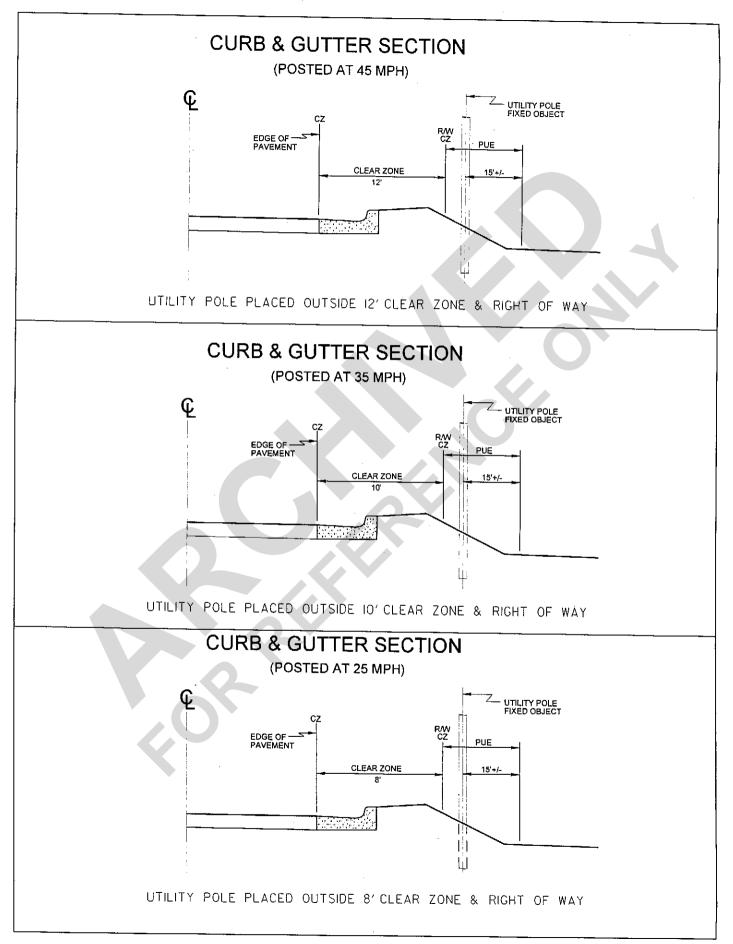
DLS/JAB

Attachments

cc: Terry Gibson, PE Deborah Barbour, PE Kevin Lacy, PE Virgil Pridemore Division Engineers Roadway Design Project Engineers Glenn Mumford, PE Roger Thomas, PE

Greg Thorpe, PhD Jon Nance, PE Victor Barbour, PE Roger Worthington, PE Ron Hancock, PE Robert Memory Doug Taylor, PE





PROPOSED DESIGN CRITERIA

DIVISION:

STATE PROJECT: F. A. PROJECT: COUNTY: PROJECT DESCRIPTION: TIP:

PAGE: 1 of ____

DATE:

PREPARED BY:

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POSTED SPEED km/hr or mph					
PROP. R/W WIDTH m or ft					
CONTROL OF ACCESS					
RUMBLE STRIPS (Y/N)					
TYPICAL SECTION TYPE					
LANE WIDTH m or ft					
SIDEWALKS (Y/N)					
BICYCLE LANES (Y/N)					
MEDIAN WIDTH m or ft					
MED. PROTECT. (GR/BARRIER)					······
SHOULDER WIDTH (total)					
MEDIAN m or ft					
OUTSIDE w/o GR m or ft					
OUTSIDE w/ GR m or ft			······		
PAVED SHOULDER					
OUTSIDE TOTAL/FDPS m or ft					
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PAVEMENT					
PAVED SHOULDER				· · · · · · · · · · · · · · · · · · ·	
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MEDIAN DITCH	······································	· · · · · · · · · · · · · · · · · · ·			
DITCH TYPICAL (A,B,C)					
CLEAR ZONE m or ft					Y1-2A, F-1
TYPICAL SECTION NO.					
			·		

NOTES:

ay A Bennetts



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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE GOVERNOR

EUGENE A. CONTI, JR. Secretary

MEMO TO: Roadway Design Project Engineers and Project Design Engineer	MEMO TO:	Roadway Design Project Engineers and Project Design	Engineers
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FROM:	Jay A. Bennett, PE State Roadway Design Engineer	f
DATE:	November 22, 2010	

SUBJECT: Interim Performance Review – Performance Dashboard & Appraisal

The Roadway Design Unit instituted NCDOT's new performance review procedure, Performance Dashboard and Appraisal (PDA's). While an interim review is not required with the new PDA's, it is encouraged and I ask that one be held by December 23, 2010. Engineering Associates will be evaluated with their normal review at the end of their stay.

As part of the interim review, the supervisor should review Section A, Performance Metrics. Section B, NCDOT Values and Section C, Competencies. The attached Performance Review Documentation form should be used to document the interim review. An Individual Development Plan may be warranted to improve one's performance or prepare them for their next position. A Corrective Action Plan may also be warranted if a serious non-adherence to NCDOT values has occurred during this cycle. Please see the attached forms. These forms are also on the Share drive in the Performance Dashboard and Appraisal folder.

If there has been a significant change in project priorities and schedules relative to PDA's, this would be the time to change the PDA metrics and weights to reflect this change. Since these PDA's depend greatly on milestones reported through STaRS, it is imperative that project schedules be accurate and maintained in the system.

As in the past, each Project Engineer should set up a meeting with Glenn, Roger, and Doug to discuss and give a verbal summary of the evaluations. If you have questions, please let me know.

JAB/hcc

Attachments

cc: Glenn Mumford, PE Doug Taylor, PE Roger Thomas, PE Patsy Stephenson

WEBSITE: WWW.NCDOT.ORG/DOH