Roadway Design Staff Meeting

Roadway Design Unit Conference Room
February 4, 2010
9:00 A.M. – 11:00 A.M.

V8i/Corridor Modeler

The introduction training for Corridor Modeler/Roadway Designer and Microstation V8i within Roadway Design has been completed. Implementation of Corridor Modeler for the production of 3-Dimensional (3D) Design Models can now begin in Roadway Design. Corridor Modeler allows us to create a 3-D design model, which is the intent of this software implementation. In order to provide an accurate model to the Contractor and Construction, the model must reflect the actual design. To accomplish this, Corridor Modeling will require some modification to our traditional workflow and some design standards. All bridge projects scheduled for a 2011 letting should use Corridor Modeler for design. The I, R, and U projects that have not reached the 25% HYD (MO 245) milestone by the January 4, 2010 implementation date should use corridor modeler. American Society of Highway Engineers (ASHE) has scheduled a Technical Seminar for Corridor Modeler/ Roadway Designer on March 30, 2010. The Template Data created in Roadway Design will be provided to the consultants as it is released and training documents will be made available for download as they are developed.

6-10 Program and Resource Plan Projects (Request for Mapping)

At this time the Photogrammerty Unit is initiating the yearly mapping needs request for projects on the 6-10 program and Resource Plan Project (during the leaf off season). Rob Allen has set up meetings to discuss the project on the spreadsheets that are highlighted in green.

Performance Dashboard and Appraisals

The PDA is a product of the Transformation Management Team and the McKinsey Report. This new performance management tool was developed to provide documentation for a “results focused” approach to performance management. As noted in the Performance Management Policy and Procedures, the purpose of performance management is to provide managers and employees a system for ensuring that:

- All employees clearly understand their job expectations.
- All employees have ongoing feedback regarding their performance.
- Development is encouraged for all employees.
- Unsatisfactory performance is addressed.
- Managers have clear accountability for achieving results that support NCDOT goals.
- Managers promote consistent adherence to NCDOT values.

Jay Bennett’s Performance Dashboard and Appraisal (PDA) letter dated March 1, 2010 provides general information on PDA implementation for the unit. Since this staff meeting, Ron McCollum demonstrated a Business Warehouse report and excel spreadsheet that should be used to complete the PDA forms.

Maintenance of Effort – Bridge Projects for March 2010 P.O.C.'s and the June 15, 2010 Letting.

Twenty one bridge replacement projects were readied for letting in March 2010 through purchase order contracts. Three additional bridge replacement projects are available for a June 15, 2010 central letting in Raleigh, N.C.

Roadway Design Unit Customer Service Survey

Overall, the results of this survey reveal that customers of the Roadway Design Unit hold mixed perceptions about the unit and the work that it does. In areas where Roadway Design Unit staff members are evaluated – areas such as the knowledge and competency of staff and their courtesy and professionalism, customers provide strong rating scores. However, rating items that focus on methods and processes tend to be perceived by customers as less favorable.

Transportation Research Board 89th Annual Meeting.

Topics Discussed: Manual for Assessing Safety Hardware (MASH), MUTCD 2009, Highway Safety Manual, Highway Capacity Manual 2010, Automated Machine Guidance (AMG), Climate Change and Conserving Energy (TBR Special report 299), Relationship between Land Development and Vehicle Miles Traveled (TRB Special Report 298), American Recovery and Reinvestment Act of 2009 (Recovey.gov), High Occupancy Toll Lanes (Hot Lanes), and Managed Lanes.

Open Discussion

Using CAT2 for our new time sheet will start Feb. 8th, 2010. Time sheets will be printed with ZTS.

Minutes Approved By: Original Signed by Jay A. Bennett Date: 03/12/10

Jay A. Bennett, PE
State Roadway Design Engineer

JAY BENNETT, PE

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DEC 1 0 '09

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

MEMO TO: Roadway Design Project Engineers

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

DATE: December 10, 2009

SUBJECT: **Corridor Modeler/3D Design Models Implementation**

The introduction training for Corridor Modeler/Roadway Designer and Microstation V8i within Roadway Design has been completed. Implementation of Corridor Modeler for the production of a 3D Design Model can now begin in Roadway Design. To facilitate workload assignments an implementation date has been set for January 4, 2010.

Generally all bridge projects scheduled for a 2011 Letting should utilize Corridor Modeler for the design. The I, R, and U projects that have not reached the 25% HYD (MO245) milestone by the January 4, 2010 implementation date should be considered as candidates for design with Corridor Modeler. Individual projects at other stages of design with large earthwork quantities should be considered as candidates for Corridor Modeler. With any new process, the individual projects in the "other" stage category will be evaluated on a case by case basis. The acceleration or delay of any individual project schedule can be discussed with me, Dewayne or Glenn.

The full implementation process will require a phased approach that reflects the project type and scope of work. The following is a proposed step by step process to achieve this implementation. The CADD support group has or is in the process of developing templates and training documents to accompany each phase of the implementation process. There are enhancements to the software being developed by Bentley that will require certain types of projects to be phased in later than others.

The Corridor Modeler allows us to create a 3D design model, which is the intent of this software implementation. In order to provide an accurate model to the Contractor and Construction, the model must reflect the actual design. To accomplish this, Corridor Modeling will require some modifications to our traditional workflow and some design standards.

Implementation Expectations and Template Data Availability

1) January 2010 – The following templates data will be available for both 2 & 4 lane projects:

Pavement Layers
Superelevation
Plan View Graphics: GR, EOP, SBG, etc.
Earthwork(New Location)
Ditch Median
Bridges(2 ln & 4 Ln.)

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

WEBSITE: WWW.NCDOT.ORG/DOH

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

2) March 2010 – This additional template data will be available for both 2 & 4 lane projects:

Earthwork (Widening)
Pavement Quantities
Slope Stake Line
Curb and Gutters
Driveways
Ditches & DDE
Overlay & Milling
Wedging
Raised Island Median

3) May 2010 – Formal training will be provided.

4) June 2010 – Additional template data will be available:

Interchange Ramps and Loops
Gore Areas
Intersections
Grade Separations
Median Barrier

5) September 2010 – Formal training will be provided.

6) October 2010 – Additional template data will be available:

Super Street
Round-a-bouts
Geotech: Undercut, Rock, Strategraphy, etc.

Consultants Projects:

No specific time line has been set for Consultant Project implementation. The Template data created in Roadway Design will be provided to the Consultants as it is released and training documents will be made available for download as they are developed. At the discretion of Engineering Coordination, projects may be evaluated on a project by project bases for Corridor Modeler design and 3D model delivery.

If you have any questions about the implementation for corridor modeling, please contact Ted Walls at 919-250-4016.

JAB/tw

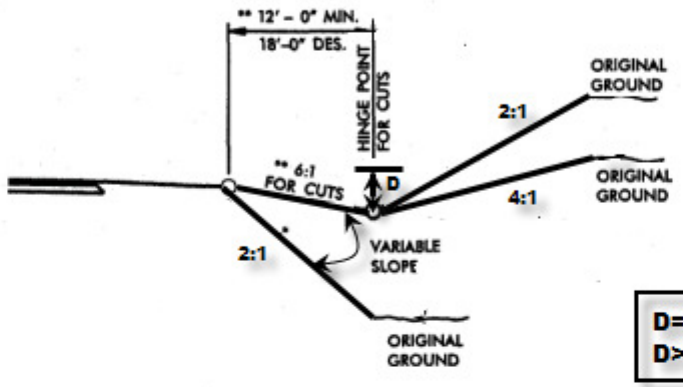
Attachment

cc: Deborah Barbour, PE
John Nance, PE
Art McMillan, PE
Ron Hancock, PE
Charlie Brown, PE, PLS
Marc Clifford, PE
Bryan Edwards, PE
Phillip Johnson, PE
Keith Johnston, PE, PLS
Jim McMellon, PE
Glenn Mumford, PE
Dewayne Sykes, PE

DRAFT

TYPICAL SECTION AND SLOPES (continued) 1-2A

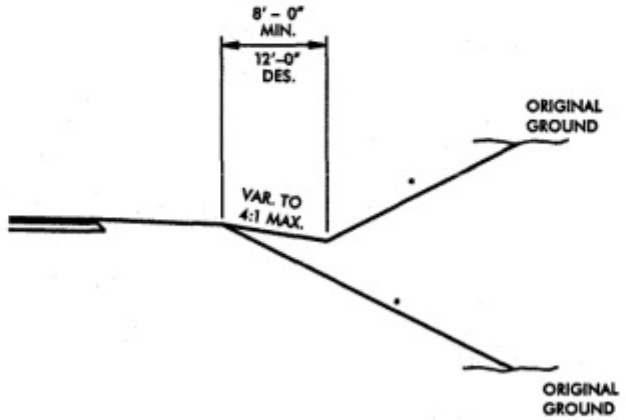
(B) ARTERIALS (OTHER THAN EXPRESSWAYS AND FOUR LANE FACILITIES), COLLECTORS, AND LOCALS (OVER 4000 ADT DESIGN YEAR TRAFFIC) 1-2A F-1



D=0 to 3' use 4:1 slope
D>3' use 2:1 slope

~~* WHEN THESE DISTANCES INDICATE SLOPES OUTSIDE THE LIMITS 6:1 TO *, THE DISTANCE BECOMES VARIABLE AND THE MAXIMUM OR MINIMUM SLOPE MAINTAINED.~~

(C) COLLECTORS AND LOCALS (4000 ADT OR LESS DESIGN YEAR TRAFFIC)



NOTES: (B AND C)

** MAY VARY TO SUIT DRAINAGE REQUIREMENTS. TWO–FOOT MINIMUM DITCH DEPTH IS REQUIRED TO COVER DRIVEWAY PIPE.

* THE STEEPEST PRACTICAL SLOPES AS DETERMINED BY THE SOILS AND FOUNDATION SECTON SHOULD BE UTILIZED. NORMALLY THESE SLOPES WILL RANGE FROM 1 1/2:1 TO 2:1. A GUARDRAIL STUDY WILL BE REQUIRED FOR FILL SLOPES STEEPER THAN 3:1.

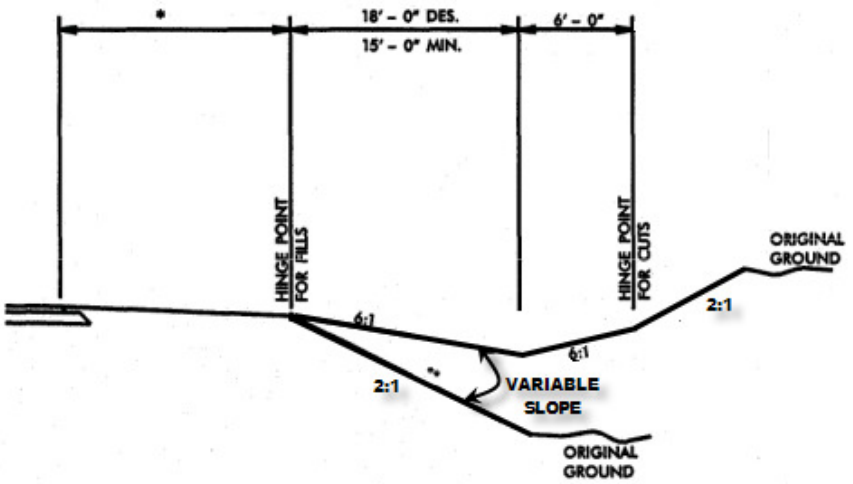
DRAFT

(A) INTERSTATES, FREEWAYS, EXPRESSWAYS & OTHER FOUR LANE FACILITIES

1 – 2A
F – 1

(ROUND BOTTOM DITCH WITH HINGE POINT SLOPES)

REVISED AUGUST 2009



* FOR SHOULDER WIDTHS, SEE ROADWAY DESIGN MANUAL, PART I, CHAPTER 1–4B, F–1.

~~WHEN SLOPE STAKE POINT FALLS OUTSIDE THE HINGE POINT DISTANCE, MAINTAIN APPROPRIATE MAXIMUM OR MINIMUM SLOPE.~~

** INTERSTATE SIDE SLOPES SHOULD NOT BE STEEPER THAN 2:1 EXCEPT IN ROCK EXCAVATION OR WHERE THERE ARE OTHER SPECIAL CONDITIONS.

ON FREEWAYS AND EXPRESSWAYS, THE STEEPEST PRACTICAL SLOPES AS DETERMINED BY THE SOILS AND FOUNDATION SECTION SHOULD BE UTILIZED. NORMALLY THESE SLOPES WILL RANGE FROM 1 1/2:1 TO 2:1.

NOTE:
THESE GUIDELINES ARE TO BE USED ALONG WITH SOUND ENGINEERING JUDGEMENT. SPECIAL CONDITIONS SUCH AS SOIL TYPE OR THE NEED FOR ADDITIONAL FILL MATERIAL MAY WARANT THE USE OF FLATTER OR STEEPER SLOPES THAN THOSE SHOWN IN THESE RECOMMENDATIONS.

DRAFT

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7-06

ENGLISH STANDARD DRAWING FOR

METHOD OF SHOULDER CONSTRUCTION

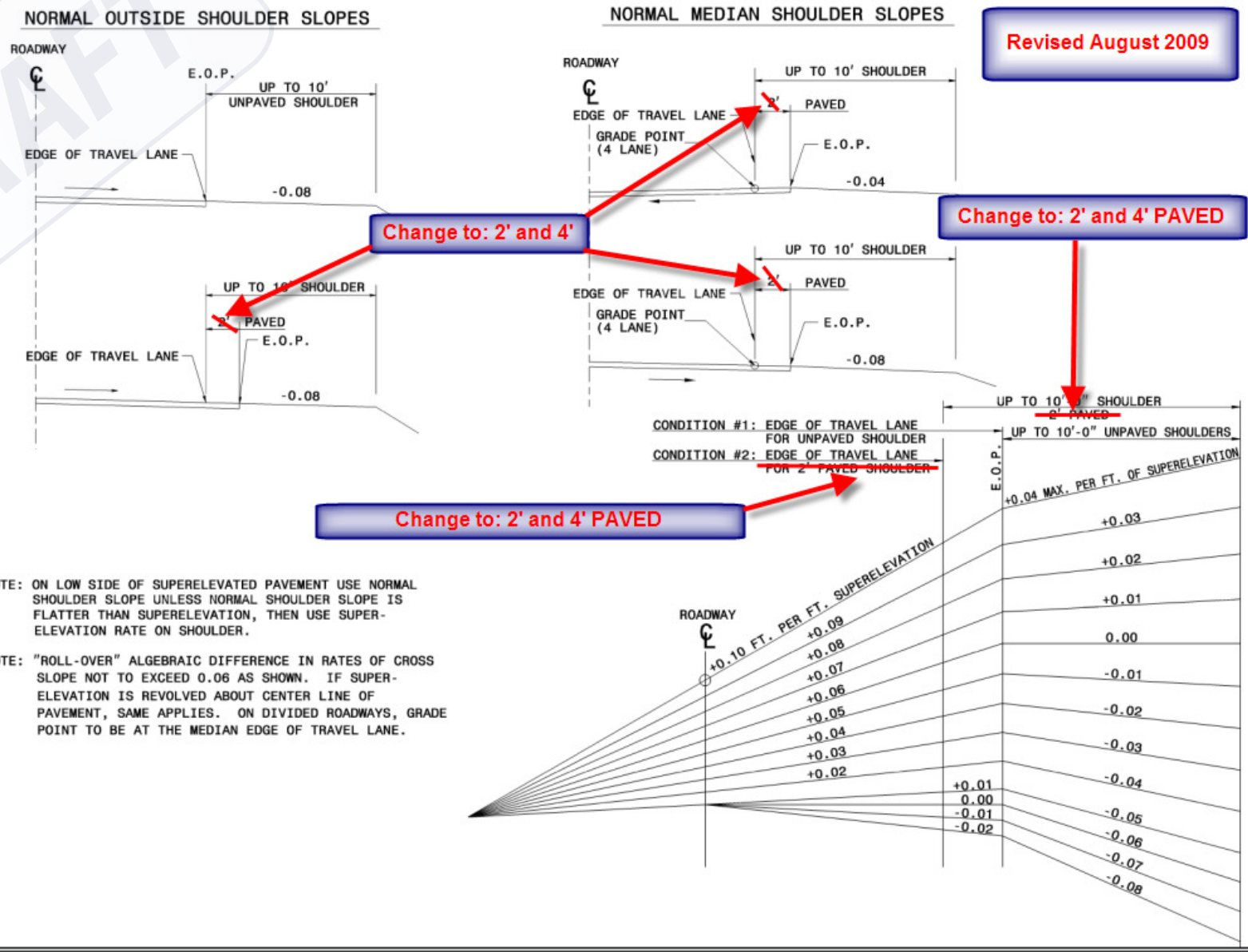
HIGH SIDE OF SUPERELEVATED CURVE

METHOD I (SHOULDERS UP TO 10')

SHEET 1 OF 2

560.01

Revised August 2009



NOTE: ON LOW SIDE OF SUPERELEVATED PAVEMENT USE NORMAL SHOULDER SLOPE UNLESS NORMAL SHOULDER SLOPE IS FLATTER THAN SUPERELEVATION, THEN USE SUPER-ELEVATION RATE ON SHOULDER.

NOTE: "ROLL-OVER" ALGEBRAIC DIFFERENCE IN RATES OF CROSS SLOPE NOT TO EXCEED 0.06 AS SHOWN. IF SUPER-ELEVATION IS REVOLVED ABOUT CENTER LINE OF PAVEMENT, SAME APPLIES. ON DIVIDED ROADWAYS, GRADE POINT TO BE AT THE MEDIAN EDGE OF TRAVEL LANE.

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ENGLISH STANDARD DRAWING FOR

METHOD OF SHOULDER CONSTRUCTION

HIGH SIDE OF SUPERELEVATED CURVE

METHOD I (SHOULDERS UP TO 10')

SHEET 1 OF 2

560.01

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7-06

ENGLISH STANDARD DRAWING FOR

METHOD OF SHOULDER CONSTRUCTION

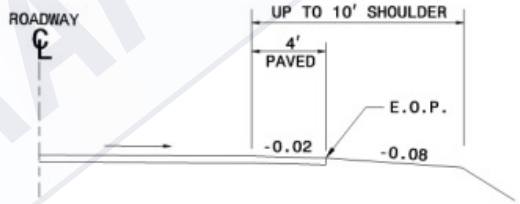
HIGH SIDE OF SUPERELEVATED CURVE

METHOD I (SHOULDERS UP TO 10')

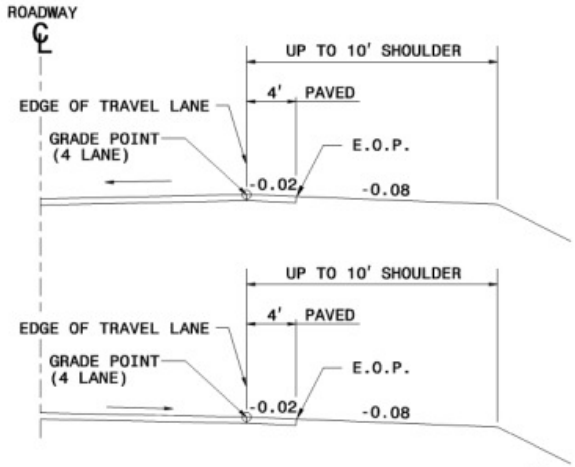
SHEET 2 OF 2

560.01

NORMAL OUTSIDE SHOULDER SLOPES



NORMAL MEDIAN SHOULDER SLOPES



Revised August 2009

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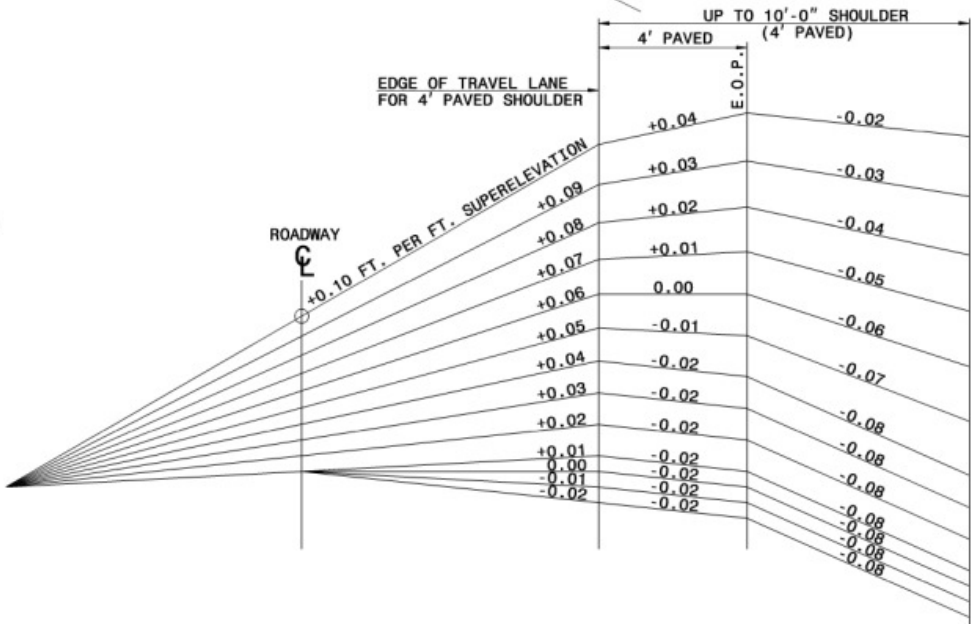

Std. Dwg 560.01 - Sheet 2 of 2 has been incorporated into Std. Dwg 560.01 - Sheet 1 of 2 therefore this sheet will be eliminated

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ENGLISH STANDARD DRAWING FOR

METHOD OF SHOULDER CONSTRUCTION

HIGH SIDE OF SUPERELEVATED CURVE

METHOD I (SHOULDERS UP TO 10')

SHEET 2 OF 2

560.01

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ENGLISH STANDARD DRAWING FOR

METHOD OF SHOULDER CONSTRUCTION

HIGH SIDE OF SUPERELEVATED CURVE

METHOD II (SHOULDERS 10' AND ABOVE)

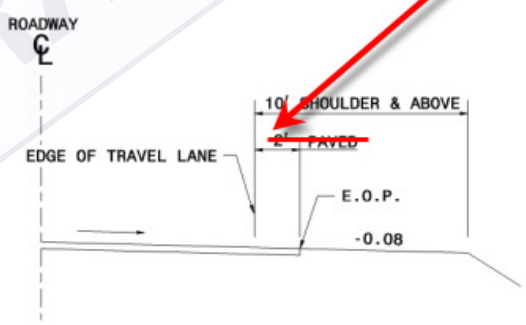
SHEET 1 OF 5

560.02

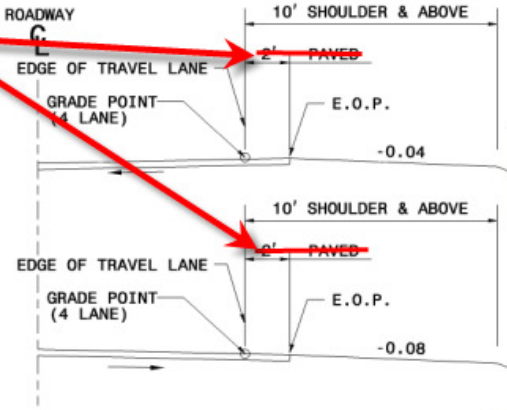
DRAFT

Revised August 2009

NORMAL OUTSIDE SHOULDER SLOPES



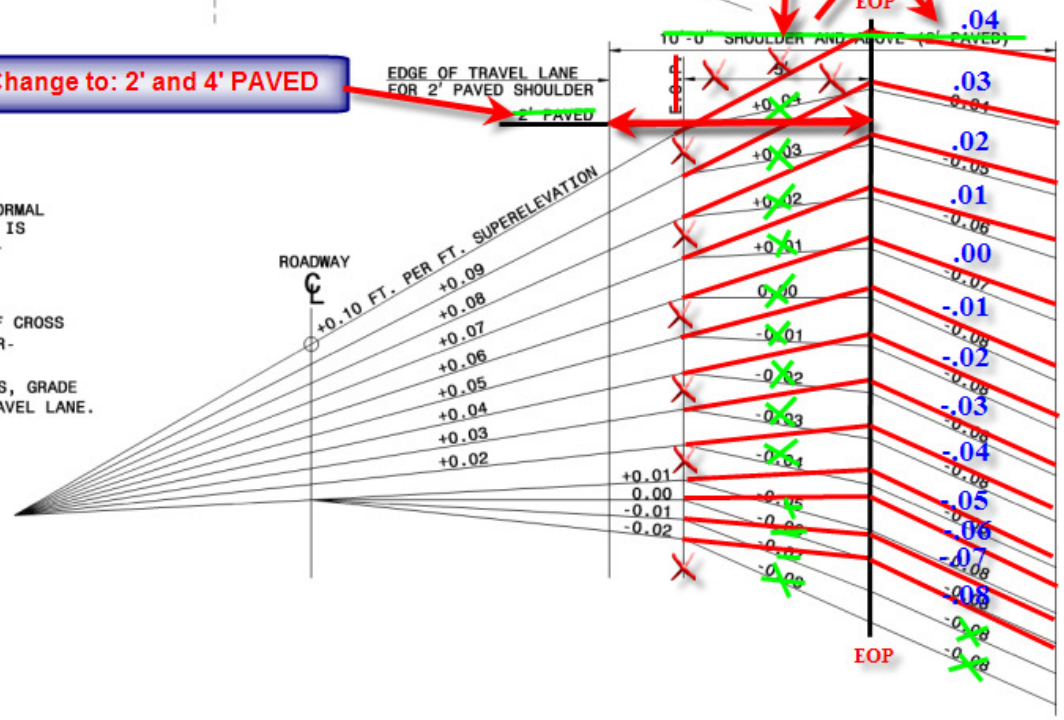
NORMAL MEDIAN SHOULDER SLOPES



Change to: 2' and 4' PAVED

Change to: 10'- 0" SHOULDER AND ABOVE (2' and 4' PAVED)

Change to: 2' and 4' PAVED



NOTE: ON LOW SIDE OF SUPERELEVATED PAVEMENT USE NORMAL SHOULDER SLOPE UNLESS NORMAL SHOULDER SLOPE IS FLATTER THAN SUPERELEVATION, THEN USE SUPER-ELEVATION RATE ON SHOULDER.

NOTE: "ROLL-OVER" ALGEBRAIC DIFFERENCE IN RATES OF CROSS SLOPE NOT TO EXCEED 0.06 AS SHOWN. IF SUPER-ELEVATION IS REVOLVED ABOUT CENTER LINE OF PAVEMENT, SAME APPLIES. ON DIVIDED ROADWAYS, GRADE POINT TO BE AT THE MEDIAN EDGE OF INSIDE TRAVEL LANE.

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ENGLISH STANDARD DRAWING FOR

METHOD OF SHOULDER CONSTRUCTION

HIGH SIDE OF SUPERELEVATED CURVE

METHOD II (SHOULDERS 10' AND ABOVE)

SHEET 1 OF 5

560.02

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ENGLISH STANDARD DRAWING FOR

METHOD OF SHOULDER CONSTRUCTION

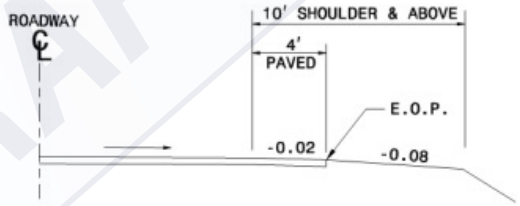
HIGH SIDE OF SUPERELEVATED CURVE

METHOD II (SHOULDERS 10' AND ABOVE)

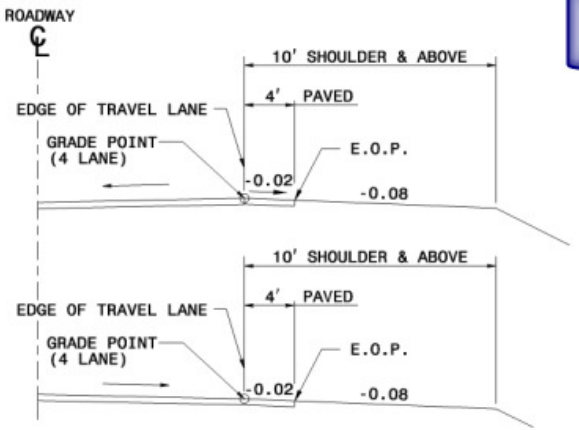
SHEET 2 OF 5

560.02

NORMAL OUTSIDE SHOULDER SLOPES



NORMAL MEDIAN SHOULDER SLOPES



Revised August 2009

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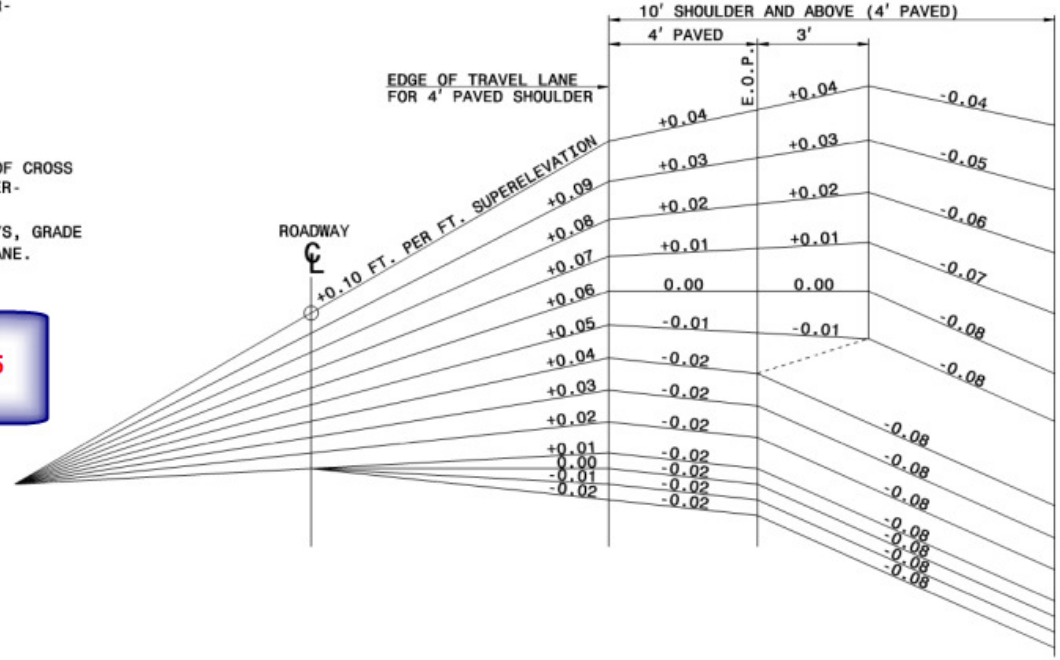
Std. Dwg 560.02 Sheet 2 of 5 has been incorporated into Std. Dwg 560.02 Sheet 1 of 5 therefore this sheet will be eliminated



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ENGLISH STANDARD DRAWING FOR

METHOD OF SHOULDER CONSTRUCTION

HIGH SIDE OF SUPERELEVATED CURVE

METHOD II (SHOULDERS 10' AND ABOVE)

SHEET 2 OF 5

560.02

STATE OF
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RALEIGH, N.C.

7-06

ENGLISH STANDARD DRAWING FOR

METHOD OF SHOULDER CONSTRUCTION

HIGH SIDE OF SUPERELEVATED CURVE

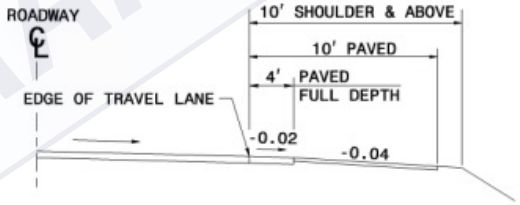
METHOD II (SHOULDERS 10' AND ABOVE)

SHEET 3 OF 5

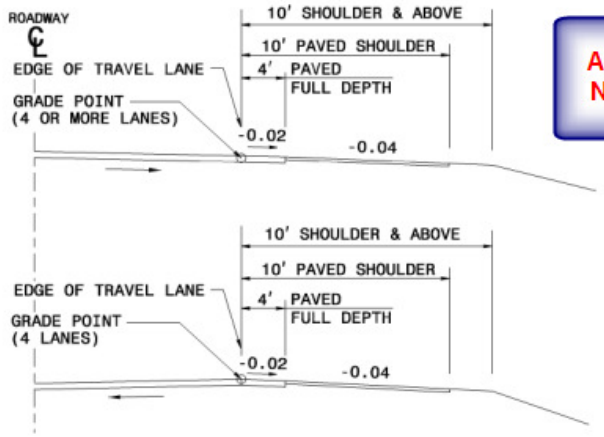
560.02

DRAFT

NORMAL OUTSIDE SHOULDER SLOPES



NORMAL MEDIAN SHOULDER SLOPES



AUGUST 2009
NO REVISION

NOTE: ON LOW SIDE OF SUPERELEVATED PAVEMENT USE NORMAL SHOULDER SLOPE UNLESS NORMAL SHOULDER SLOPE IS FLATTER THAN SUPERELEVATION, THEN USE SUPER-ELEVATION RATE ON SHOULDER.

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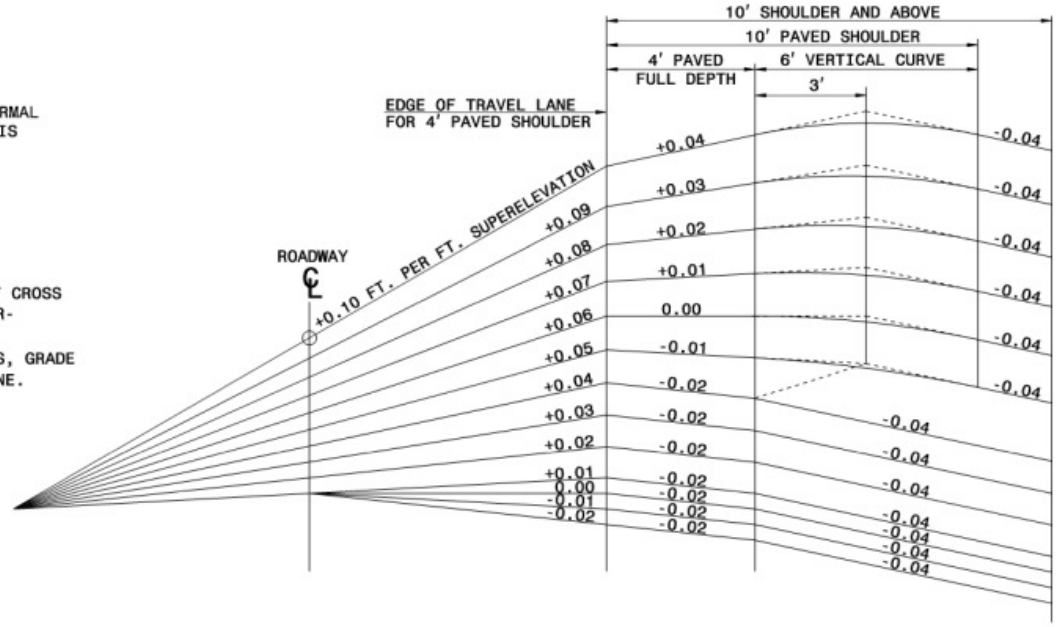

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7-06

ENGLISH STANDARD DRAWING FOR

METHOD OF SHOULDER CONSTRUCTION

HIGH SIDE OF SUPERELEVATED CURVE

METHOD II (SHOULDERS 10' AND ABOVE)

SHEET 3 OF 5

560.02

DRAFT

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

7-06

ENGLISH STANDARD DRAWING FOR

METHOD OF SHOULDER CONSTRUCTION

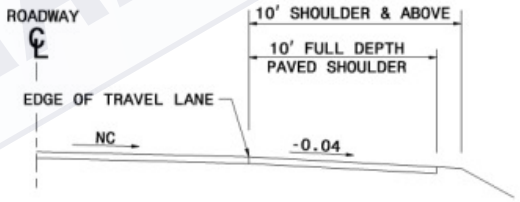
HIGH SIDE OF SUPERELEVATED CURVE

METHOD II (FULL DEPTH SHOULDERS 10' AND ABOVE)

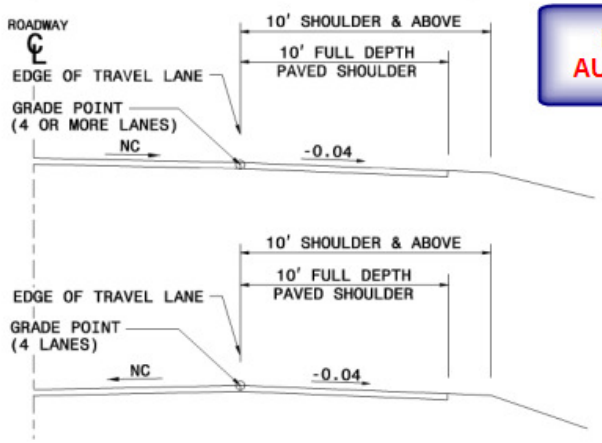
SHEET 4 OF 5

560.02

NORMAL OUTSIDE SHOULDER SLOPES



NORMAL MEDIAN SHOULDER SLOPES



REVISED
AUGUST 2009

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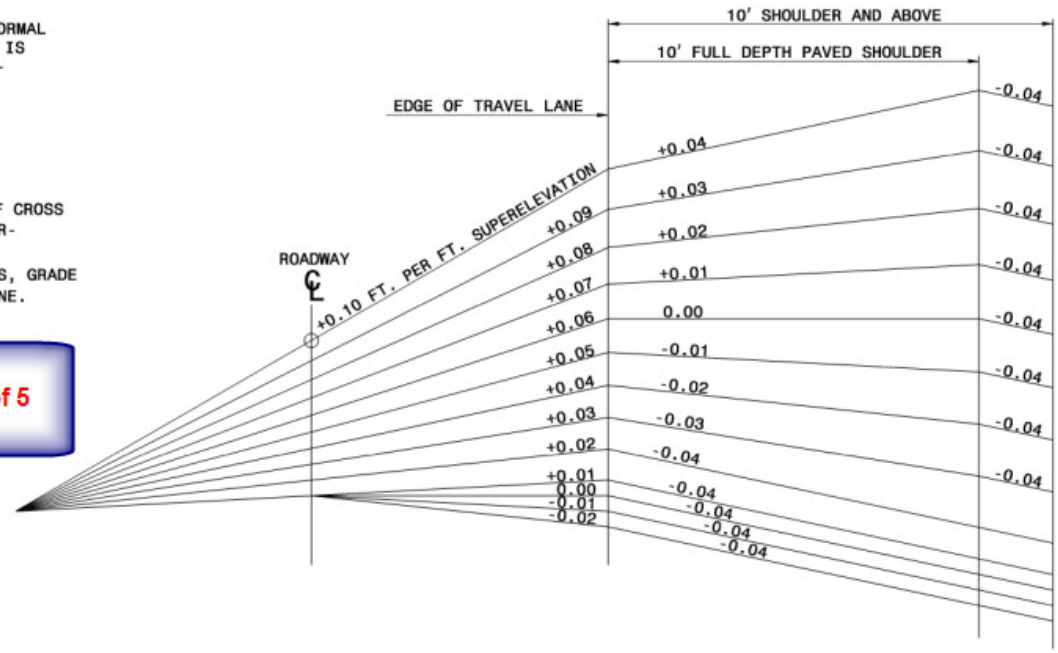
Std. Dwg 560.02 Sheet 4 of 5 has been incorporated into Std. Dwg 560.02 Sheet 5 of 5 therefore this sheet will be eliminated



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7-06

ENGLISH STANDARD DRAWING FOR

METHOD OF SHOULDER CONSTRUCTION

HIGH SIDE OF SUPERELEVATED CURVE

METHOD II (FULL DEPTH SHOULDERS 10' AND ABOVE)

SHEET 4 OF 5

560.02

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STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

7-06

ENGLISH STANDARD DRAWING FOR

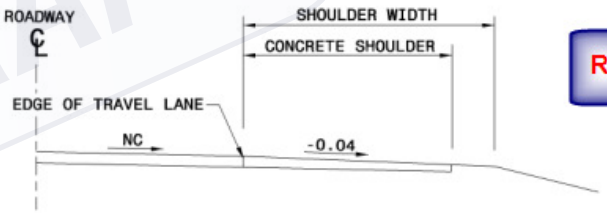
METHOD OF SHOULDER CONSTRUCTION

HIGH SIDE OF SUPERELEVATED CURVE
METHOD II (CONCRETE SHOULDER)

SHEET 5 OF 5

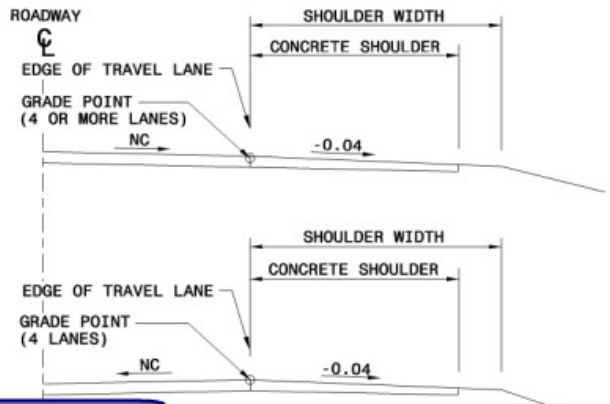
560.02

NORMAL OUTSIDE CONCRETE SHOULDER SLOPES



REVISED AUGUST 2009

NORMAL MEDIAN CONCRETE SHOULDER SLOPES



NOTE: ON LOW SIDE OF SUPERELEVATED PAVEMENT USE NORMAL SHOULDER SLOPE UNLESS NORMAL SHOULDER SLOPE IS FLATTER THAN SUPERELEVATION, THEN USE SUPER-ELEVATION RATE ON SHOULDER.

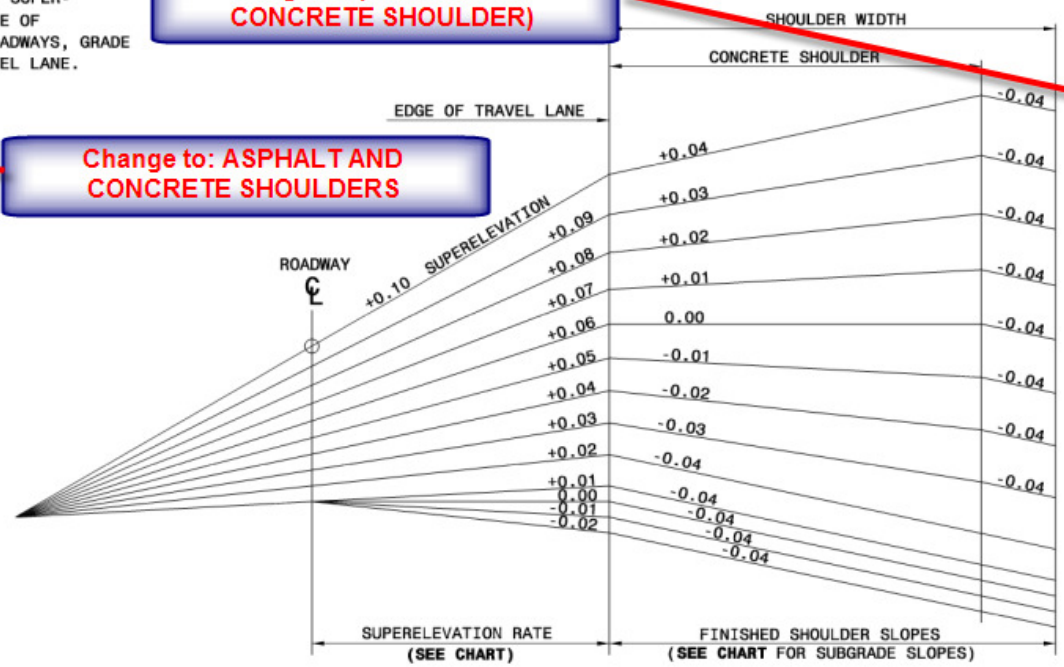
NOTE: "ROLL-OVER" ALGEBRAIC DIFFERENCE IN RATES OF CROSS SLOPE NOT TO EXCEED 0.06 AS SHOWN. IF SUPER-ELEVATION IS REVOLVED ABOUT CENTER LINE OF PAVEMENT, SAME APPLIES. ON DIVIDED ROADWAYS, GRADE POINT TO BE AT THE MEDIAN EDGE OF TRAVEL LANE.

Change to: (ASPHALT AND CONCRETE SHOULDER)

Change to: ASPHALT AND CONCRETE SHOULDERS

~~CONCRETE SHOULDERS~~	
TRAVEL LANE SUPERELEVATION RATE	*SHOULDER SUBGRADE SLOPE
-0.02	-0.02
-0.01	-0.02
0.00	-0.02
+0.01	-0.02
+0.02	-0.02
+0.03	-0.01
+0.04	0.00
+0.05	+0.01
+0.06	+0.02
+0.07	+0.03
+0.08	+0.04
+0.09	+0.05
+0.10	+0.06

*SHOULDER SUBGRADE SLOPE SAME AS FINISHED SHOULDER SLOPE WHEN USING THROUGH LANE PAVEMENT ON SHOULDERS



STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

7-06

ENGLISH STANDARD DRAWING FOR

METHOD OF SHOULDER CONSTRUCTION

HIGH SIDE OF SUPERELEVATED CURVE
METHOD II (~~CONCRETE SHOULDER~~)

SHEET 5 OF 5

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