

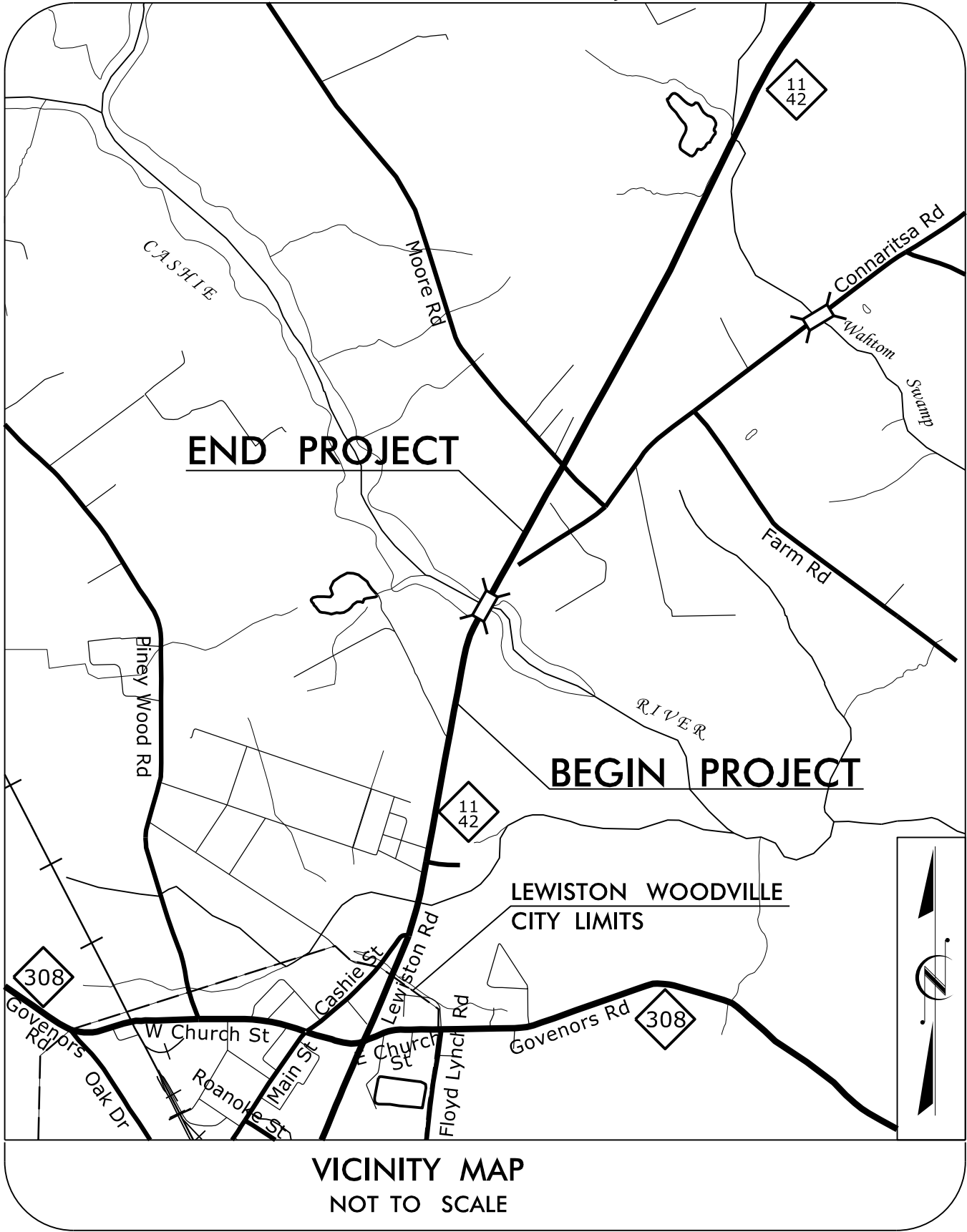
09/08/2025

\\\\proj\\BR-0153_rdy - t.sh.dgn
USER:spalding

TIP PROJECT: BR-0153

CONTRACT: C205033

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbols



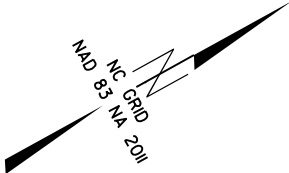
VICINITY MAP
NOT TO SCALE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BERTIE COUNTY

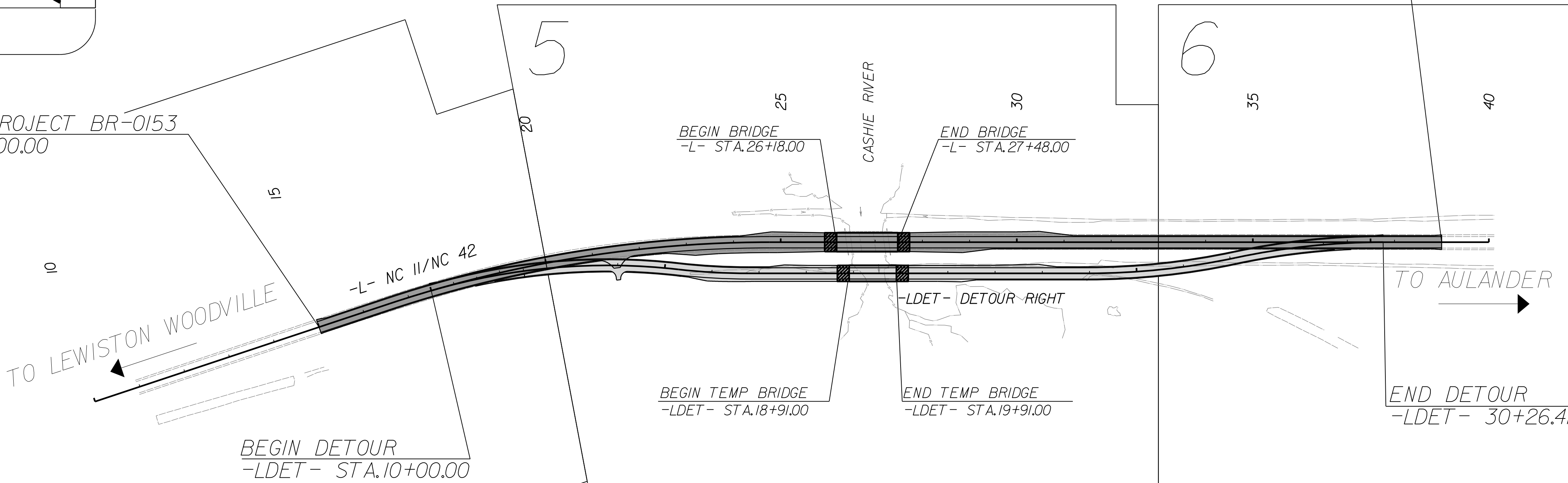
LOCATION: BRIDGE 24 ON NC 11/NC 42 OVER CASHIE RIVER
TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0153	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
67153.1.1		PE	
67153.2.1		ROW/UTILITIES	
51831.3.1	5183101	CONSTRUCTION	



BEGIN TIP PROJECT BR-0153
-L- STA.15+00.00

END TIP PROJECT BR-0153
-L- STA.39+00.00

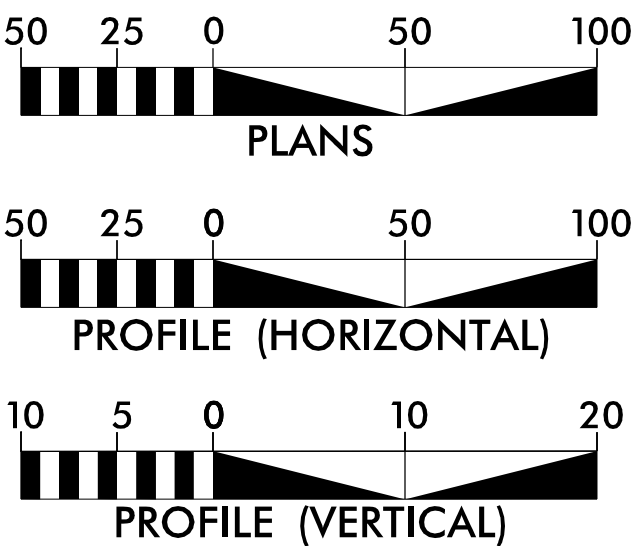


THIS IS A PARTIAL CONTROLLED ACCESS PROJECT
WITH ACCESS BEING LIMITED TO POINTS AS SHOWN
ON THE PLANS.

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES



DESIGN DATA

ADT 2025 = 6,350
ADT 2045 = 6,900
K = 8 %
D = 55 %
T = 16 % *
V = 60 MPH
* TTST =12 DUAL=4
FUNC CLASS =
MINOR ARTERIAL
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT BR-0153 = 0.430 MI
LENGTH STRUCTURE TIP PROJECT BR-0153 = 0.025 MI
TOTAL LENGTH TIP PROJECT BR-0153 = 0.455 MI

2024 STANDARD SPECIFICATIONS

Prepared In the Office of:
NC FIRM LICENSE No: F-1320
8000 REGENCY PARKWAY, STE 175
CARY, NC 27518
(984) 275-2490

RIGHT OF WAY DATE:
OCTOBER 15, 2024

LETTING DATE:
SEPTEMBER 16, 2025

LAURA C. FISHER, PE
PROJECT ENGINEER

ERIC D. SPALDING, PE
PROJECT DESIGN ENGINEER

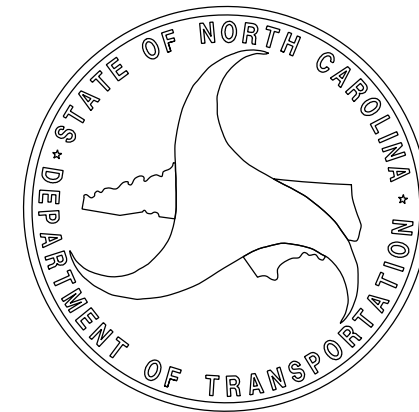
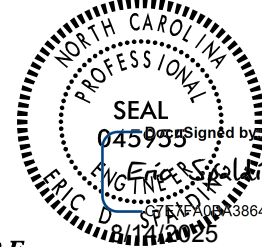
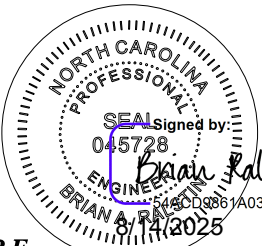
DAVID S. STUTTS, PE
NCDOT CONTACT

HYDRAULICS ENGINEER

SIGNATURE:

ROADWAY DESIGN
ENGINEER

SIGNATURE:



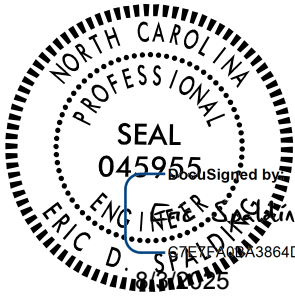
8/17/99

#####SYSTEMS#####
r:\p\o\N\BP-0153-rdy_1A.dgn
USER:rdy_1A

PROJECT REFERENCE NO.
BR-0153

SHEET NO.
1A

ROADWAY DESIGN ENGINEER



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

SHEET NUMBER	INDEX OF SHEETS	SHEET
1	TITLE SHEET	
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS	
1B	CONVENTIONAL SYMBOLS	
2A-1 THRU 2A-2	PAVEMENT SCHEDULE AND TYPICAL SECTIONS	
2B-1 THRU 2B-2	ROADWAY DETAILS	
2C-1 THRU 2C-8	SPECIAL DETAILS	
3B-1	ROADWAY SUMMARIES	
3D-1	DRAINAGE SUMMARIES	
3G-1	GEOTECHNICAL SUMMARIES	
3P-1	PARCEL INDEX SHEET	
4 THRU 8	PLAN AND PROFILE SHEET	
RW01 THRU RW06	SURVEY CONTROL, EXISTING CENTERLINES, RIGHT OF WAY, EASEMENT AND PROPERTY TIES	
TMP-1 THRU TMP-19	TRAFFIC MANAGEMENT PLANS	
PMP-1 THRU PMP-5	PAVEMENT MARKING PLANS	
EC-1 THRU EC-11	EROSION CONTROL PLANS	
UC-1 THRU UC-5	UTILITIES CONSTRUCTION PLANS	
UO-1 THRU UO-4	UTILITIES BY OTHERS PLANS	
X-1A THRU X-1B	CROSS-SECTION INDEX AND SUMMARY SHEET	
X-1 THRU X-20	CROSS-SECTIONS	
S-1 THRU S-31	STRUCTURE PLANS	

GENERAL NOTES: 2024 SPECIFICATIONS
EFFECTIVE: 01-16-2024
REVISED:

GRADE LINE:
GRADING AND SURFACING OR RESURFACING AND WIDENING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE IN.

CLEARING:
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD 11.

SUPERELEVATION:
ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:
ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01

SIDE ROADS:
THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

SUBSURFACE DRAINS:
SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 AT LOCATIONS DIRECTED BY THE ENGINEER.

GUARDRAIL:
THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

TEMPORARY SHORING:
SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

END BENTS:
THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

UTILITIES:
UTILITY OWNERS ON THIS PROJECT ARE

AT&T, Bertie County, BrightSpeed, Piedmont Natural Gas

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

2024 ROADWAY ENGLISH STANDARD DRAWINGS

EFF. 01-16-2024
REV.

The following Roadway Standards as appear in "Roadway Standard Drawings" Contracts Standards and Development Unit - N. C. Department of Transportation - Raleigh, N. C., Dated January 16, 2024 are applicable to this project and by reference hereby are considered a part of these plans:

- | STD.NO. | TITLE |
|--|--|
| DIVISION 2 - EARTHWORK | |
| 200.02 | Method of Clearing - Method 11 |
| 225.02 | Guide for Grading Subgrade - Secondary and Local |
| 225.04 | Method of Obtaining Superelevation - Two Lane Pavement |
| DIVISION 3 - PIPE CULVERTS | |
| 310.10 | Driveway Pipe Construction |
| DIVISION 4 - MAJOR STRUCTURES | |
| 423.01 | Bridge Approach Fills - Type 1 Approach Fill for Bridge Abutment |
| 423.02 | Bridge Approach Fills - Type 1A Alternate Approach Fill for Integral Bridge Abutment |
| DIVISION 5 - SUBGRADE, BASES AND SHOULDERS | |
| 560.01 | Method of Shoulder Construction - High Side of Superelevated Curve - Method 1 |
| DIVISION 6 - ASPHALT BASES AND PAVEMENTS | |
| 665.01 | Asphalt Shoulders - Milled Rumble Strips |
| DIVISION 8 - INCIDENTALS | |
| 815.02 | Subsurface Drain |
| 840.00 | Concrete Base Pad for Drainage Structures |
| 840.18 | Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe |
| 840.25 | Anchorage for Frames - Brick or Concrete or Precast |
| 840.27 | Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe |
| 840.29 | Frames and Narrow Slot Flat Grates |
| 840.35 | Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates |
| 840.45 | Precast Drainage Structure |
| 840.46 | Traffic Bearing Precast Drainage Structure |
| 840.66 | Drainage Structure Steps |
| 846.04 | Drop Inlet Installation in Shoulder Berm Gutter |
| 846.01 | Concrete Curb, Gutter and Curb & Gutter |
| 862.01 | Guardrail Placement (Use Details in Lieu of Standards for Sheets 4, 6, 12, and 14 of 15) |
| 862.02 | Guardrail Installation |
| 862.03 | Structure Anchor Units (Use Detail in Lieu of Standard for Sheet 8 of 9) |
| 862.04 | Anchoring End of Guardrail - for B-77 and B-83 Anchor Units |
| 876.01 | Rip Rap in Channels and Ditches |
| 876.02 | Guide for Rip Rap at Pipe Outlets |
| 876.04 | Drainage Ditches with Class 'B' Rip Rap |

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

BOUNDARIES AND PROPERTY:

State Line	
County Line	
Township Line	
City Line	
Reservation Line	
Property Line	
Existing Iron Pin (EIP)	
Computed Property Corner	
Existing Concrete Monument (ECM)	
Parcel/Sequence Number	
Existing Fence Line	
Proposed Woven Wire Fence	
Proposed Chain Link Fence	
Proposed Barbed Wire Fence	
Existing Wetland Boundary	
Proposed Wetland Boundary	
Existing Endangered Animal Boundary	
Existing Endangered Plant Boundary	
Existing Historic Property Boundary	
Known Contamination Area: Soil	
Potential Contamination Area: Soil	
Known Contamination Area: Water	
Potential Contamination Area: Water	
Contaminated Site: Known or Potential	

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	
Sign	
Well	
Small Mine	
Foundation	
Area Outline	
Cemetery	
Building	
School	
Church	
Dam	

HYDROLOGY:

Stream or Body of Water	
Hydro, Pool or Reservoir	
Jurisdictional Stream	
Buffer Zone 1	
Buffer Zone 2	
Flow Arrow	
Disappearing Stream	
Spring	
Wetland	
Proposed Lateral, Tail, Head Ditch	
False Sump	

RAILROADS:

Standard Gauge	
RR Signal Milepost	
Switch	
RR Abandoned	
RR Dismantled	

RIGHT OF WAY & PROJECT CONTROL:

Primary Horiz Control Point	
Primary Horiz and Vert Control Point	
Secondary Horiz and Vert Control Point	
Vertical Benchmark	
Existing Right of Way Monument	
Proposed Right of Way Monument (Rebar and Cap)	
Proposed Right of Way Monument (Concrete)	
Existing Permanent Easement Monument	
Proposed Permanent Easement Monument (Rebar and Cap)	
Existing C/A Monument	
Proposed C/A Monument (Rebar and Cap)	
Proposed C/A Monument (Concrete)	
Existing Right of Way Line	
Proposed Right of Way Line	
Existing Control of Access Line	
Proposed Control of Access Line	
Proposed ROW and CA Line	
Existing Easement Line	
Proposed Temporary Construction Easement	
Proposed Temporary Drainage Easement	
Proposed Permanent Drainage Easement	
Proposed Permanent Drainage/Utility Easement	
Proposed Permanent Utility Easement	
Proposed Temporary Utility Easement	
Proposed Aerial Utility Easement	

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	
Existing Curb	
Proposed Slope Stakes Cut	
Proposed Slope Stakes Fill	
Proposed Curb Ramp	
Existing Metal Guardrail	
Proposed Guardrail	
Existing Cable Guiderail	
Proposed Cable Guiderail	
Equality Symbol	
Pavement Removal	
VEGETATION:	
Single Tree	
Single Shrub	
Hedge	

Woods Line	
Orchard	
Vineyard	

EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	
Bridge Wing Wall, Head Wall and End Wall	
MINOR:	
Head and End Wall	
Pipe Culvert	
Footbridge	
Drainage Box: Catch Basin, DI or JB	
Paved Ditch Gutter	
Storm Sewer Manhole	
Storm Sewer	

UTILITIES:

* SUE – Subsurface Utility Engineering
LOS – Level of Service – A,B,C or D (Accuracy)

POWER:	
Existing Power Pole	
Proposed Power Pole	
Existing Joint Use Pole	
Proposed Joint Use Pole	
Power Manhole	
Power Line Tower	
Power Transformer	
U/G Power Cable Hand Hole	
H-Frame Pole	
U/G Power Line Test Hole (SUE – LOS A)*	
U/G Power Line (SUE – LOS B)*	
U/G Power Line (SUE – LOS C)*	
U/G Power Line (SUE – LOS D)*	

TELEPHONE:

Existing Telephone Pole	
Proposed Telephone Pole	
Telephone Manhole	
Telephone Pedestal	
Telephone Cell Tower	
U/G Telephone Cable Hand Hole	
U/G Telephone Test Hole (SUE – LOS A)*	
U/G Telephone Cable (SUE – LOS B)*	
U/G Telephone Cable (SUE – LOS C)*	
U/G Telephone Cable (SUE – LOS D)*	
U/G Telephone Conduit (SUE – LOS B)*	
U/G Telephone Conduit (SUE – LOS C)*	
U/G Telephone Conduit (SUE – LOS D)*	
U/G Fiber Optics Cable (SUE – LOS B)*	
U/G Fiber Optics Cable (SUE – LOS C)*	
U/G Fiber Optics Cable (SUE – LOS D)*	

WATER:

Water Manhole	
Water Meter	
Water Valve	
Water Hydrant	
U/G Water Line Test Hole (SUE – LOS A)*	
U/G Water Line (SUE – LOS B)*	
U/G Water Line (SUE – LOS C)*	
U/G Water Line (SUE – LOS D)*	
Above Ground Water Line	

TV:

TV Pedestal	
TV Tower	
U/G TV Cable Hand Hole	
U/G TV Test Hole (SUE – LOS A)*	
U/G TV Cable (SUE – LOS B)*	
U/G TV Cable (SUE – LOS C)*	
U/G TV Cable (SUE – LOS D)*	
U/G Fiber Optic Cable (SUE – LOS B)*	
U/G Fiber Optic Cable (SUE – LOS C)*	
U/G Fiber Optic Cable (SUE – LOS D)*	

GAS:

Gas Valve	
Gas Meter	
U/G Gas Line Test Hole (SUE – LOS A)*	
U/G Gas Line (SUE – LOS B)*	
U/G Gas Line (SUE – LOS C)*	
U/G Gas Line (SUE – LOS D)*	
Above Ground Gas Line	

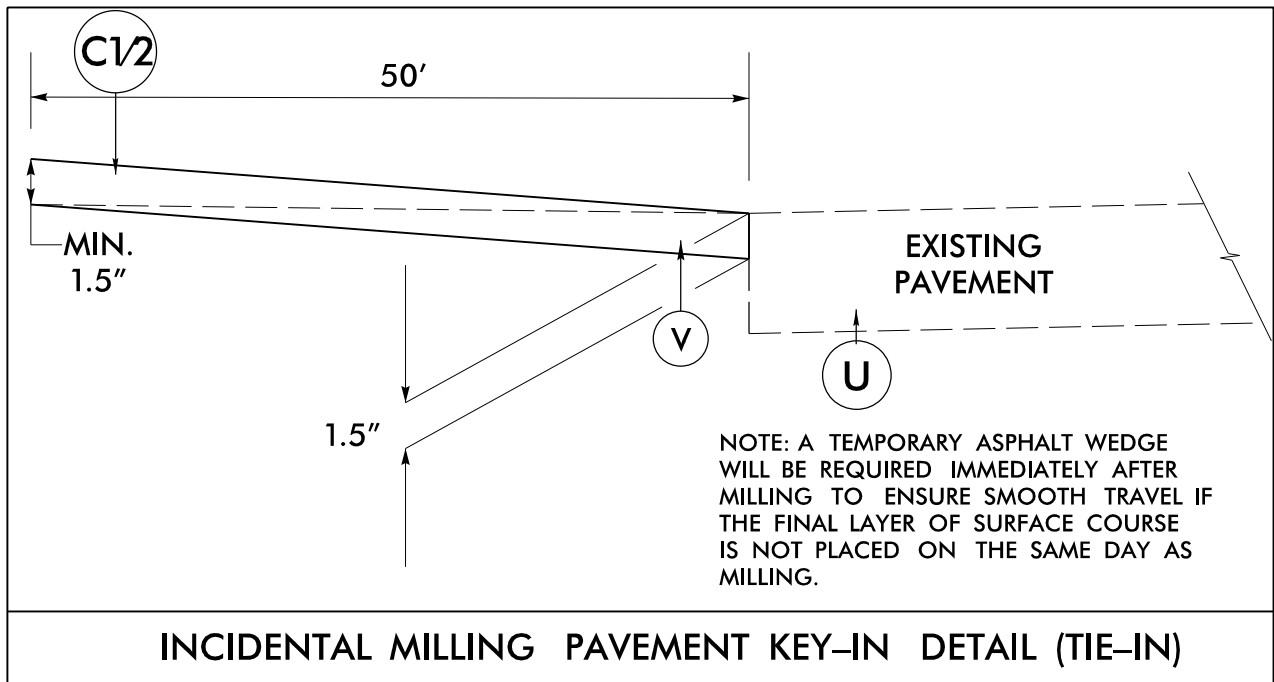
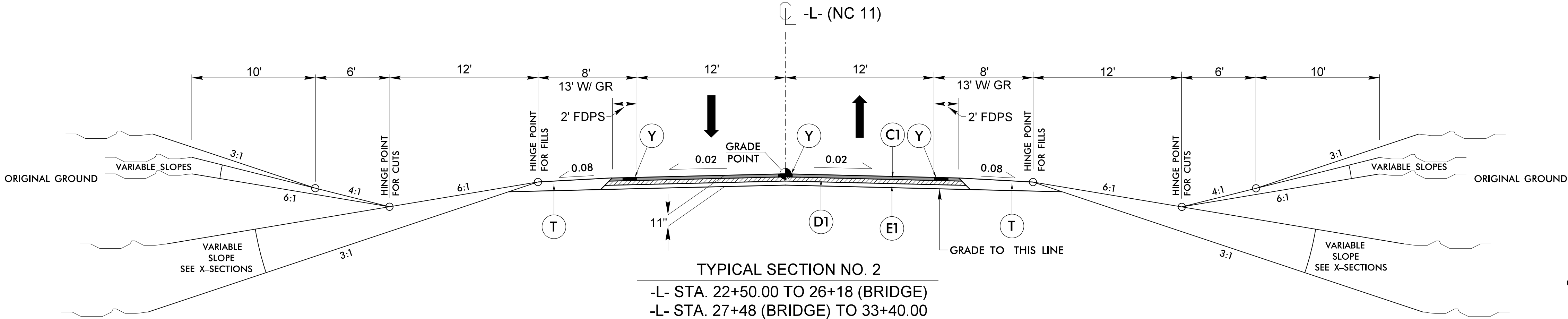
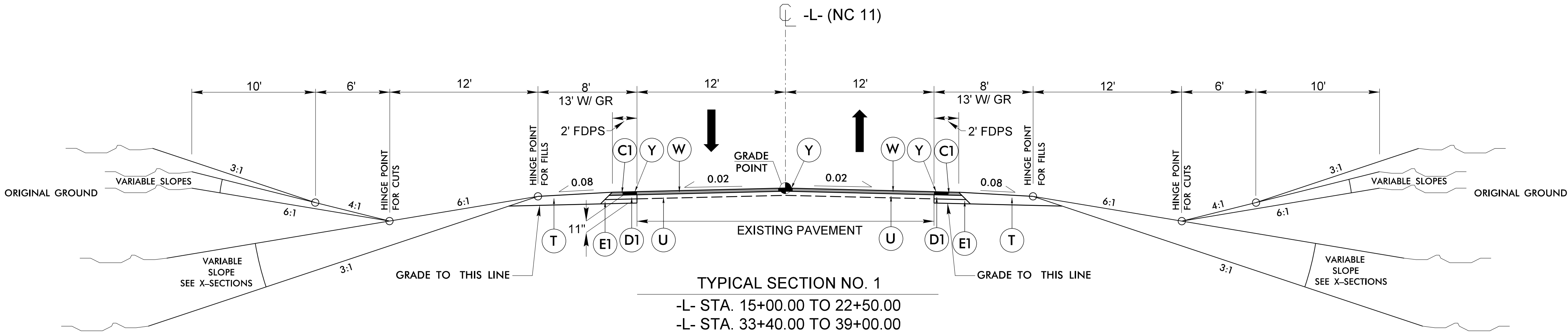
SANITARY SEWER:

Sanitary Sewer Manhole	
Sanitary Sewer Cleanout	
U/G Sanitary Sewer Line	
Above Ground Sanitary Sewer	
SS Force Main Line Test Hole (SUE – LOS A)*	
SS Force Main Line (SUE – LOS B)*	
SS Force Main Line (SUE – LOS C)*	
SS Force Main Line (SUE – LOS D)*	

MISCELLANEOUS:

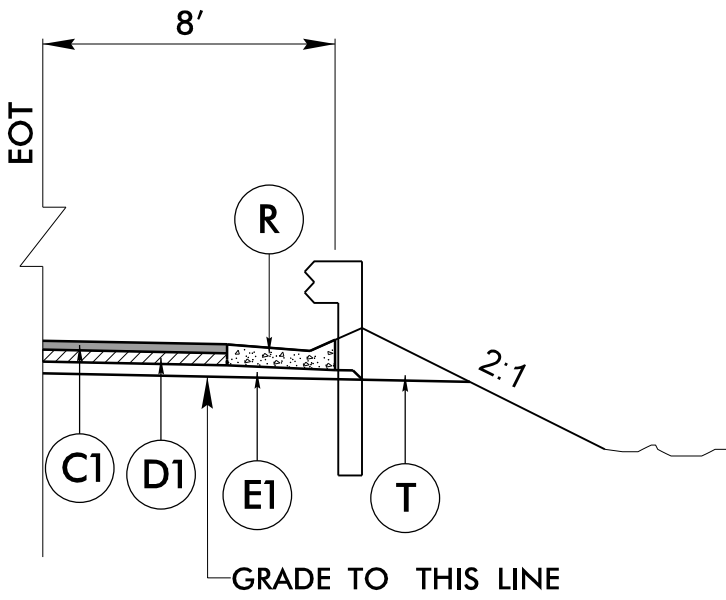
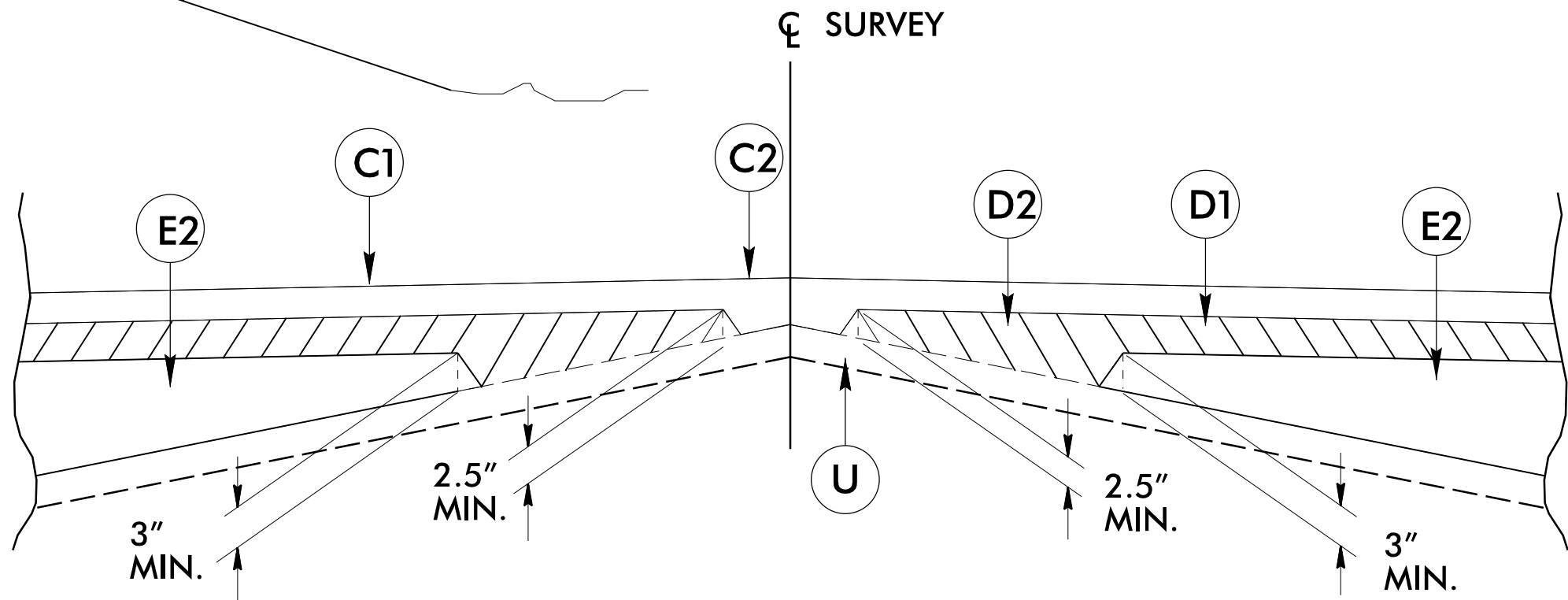
Utility Pole	
Utility Pole with Base	
Utility Located Object	
Utility Traffic Signal Box	
Utility Unknown U/G Line (SUE – LOS B)*	
U/G Tank; Water, Gas, Oil	
Underground Storage Tank, Approx. Loc.	
A/G Tank; Water, Gas, Oil	
Geoenvironmental Boring	
Abandoned According to Utility Records	
End of Information	

5/14/99



-L- STA 15+00.00 TO 15+50.00
-L- STA 38+50.00 TO 39+00.00

FINAL PAVEMENT SCHEDULE



-L- STA. 27+73 TO STA. 27+96 RT.
-L- STA. 27+73 TO STA. 27+96 LT. *
(* REVERSE TYPICAL FOR LEFT SIDE)

C1	PROP. APPROX. 3.0" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5C AT AN AVERAGE RATE OF 168 LBS PER SQ. YD. IN EACH OF TWO LAYERS
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE TYPE S9.5C AT AN AVERAGE RATE OF 112 LBS PER SQ. YD. PER 1" DEPTH IN LAYERS NOT TO EXCEED 2" IN DEPTH.
D1	PROP. APPROX. 4.0" ASPHALT CONCRETE INTERMEDIATE COURSE TYPE I19.0C AT AN AVERAGE RATE OF 456 LBS PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE I19.0C AT AVG. RATE OF 114 LBS PER SQ. YD. PER 1" DEPTH IN LAYERS NOT LESS THAN 2.5" OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4.0" ASPHALT CONCRETE BASE COURSE TYPE B25.0C AT AN AVERAGE RATE OF 456 LBS PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE B25.0C AT AN AVG. RATE OF 114 LBS PER SQ. YD. PER 1" DEPTH IN LAYERS NOT LESS THAN 3" OR GREATER THAN 5.5" IN DEPTH.
J	8" AGGREGATE BASE COURSE
P	PRIME COAT AT THE RATE OF .35 GAL. PER SQ. YARD
R	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	INCIDENTAL MILLING
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL)
Y	RUMBLE STRIPS

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

PROJECT REFERENCE NO.
BR-0153

SHEET NO.
2A-1

ROADWAY DESIGN ENGINEER

C. O. SPALDING
05/2025

PAVEMENT DESIGN ENGINEER

D. J. SPALDING
05/2025

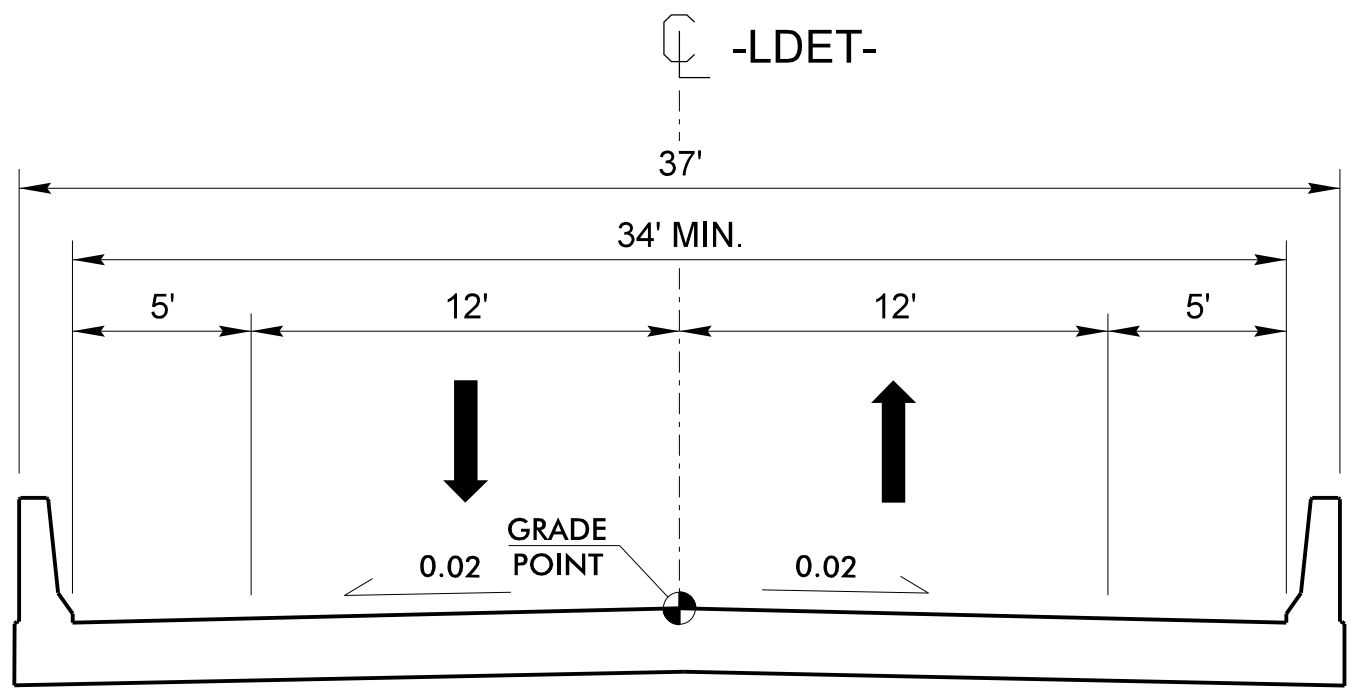
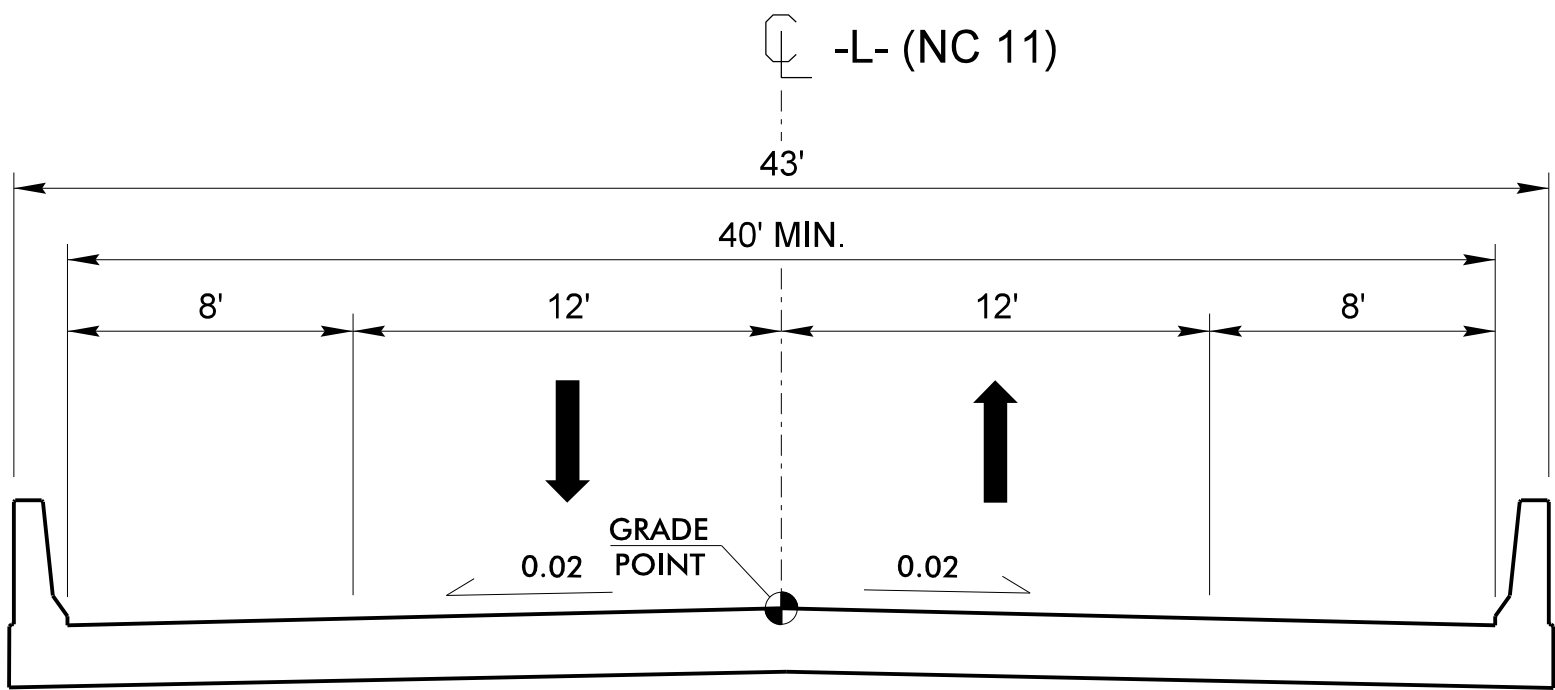
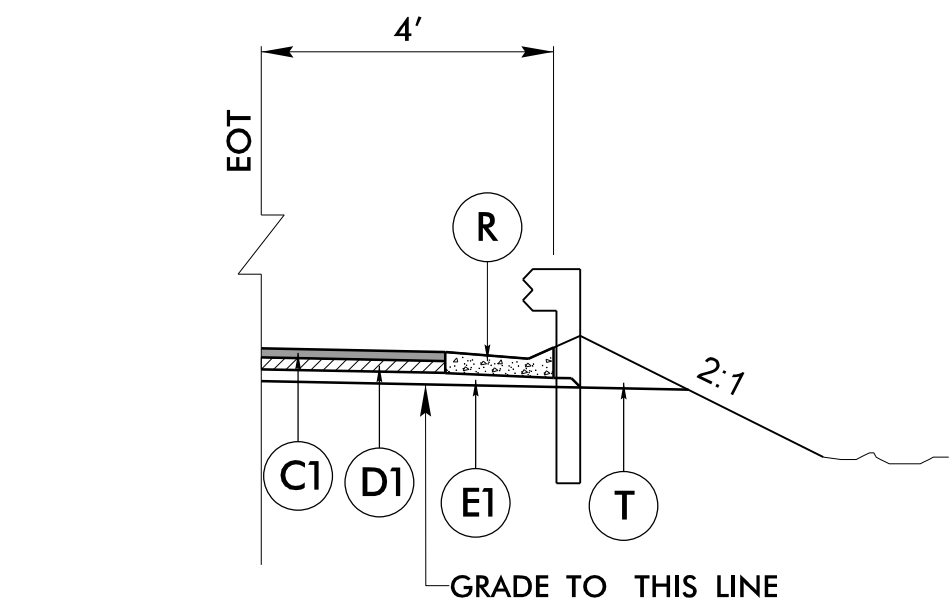
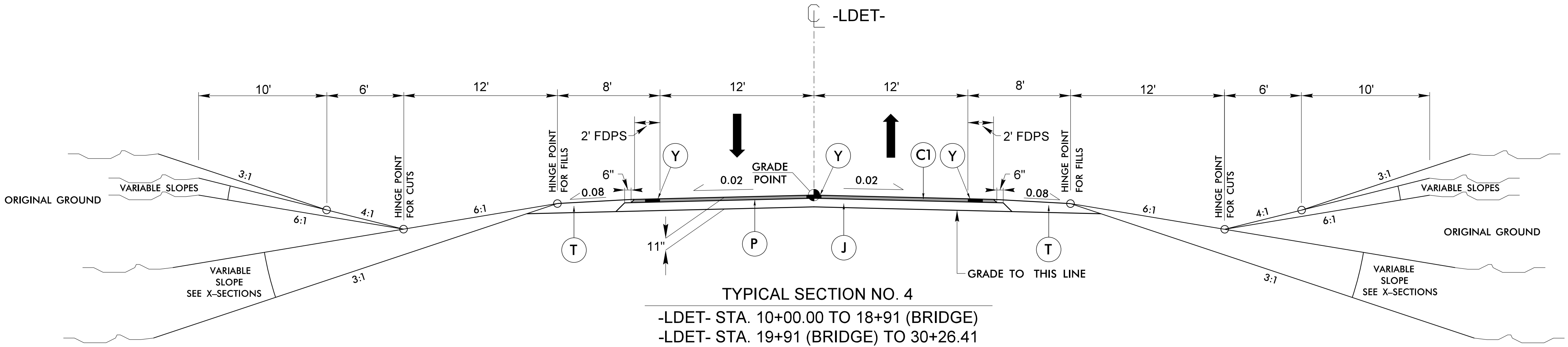
NC FIRM LICENSE No: F-1320
8000 REGENCY PARKWAY, STE 175
CARY, NC 27513
(919) 275-2490

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\$\$\$\$SYTIME\$\$\$\$
USER:spalding
5/14/99

5/14/99

\$\$\$\$SYTIME\$\$\$\$
USER: 0153_rdy_tup.dgn



NOTE: SEE STRUCTURE PLANS FOR STRUCTURE CONSTRUCTION DETAILS

PROJECT REFERENCE NO.
BR-0153

SHEET NO.
2A-2

ROADWAY DESIGN ENGINEER

MICHAEL D. SPANGLER
8/31/2025

PAVEMENT DESIGN ENGINEER

MICHAEL D. SPANGLER
8/31/2025

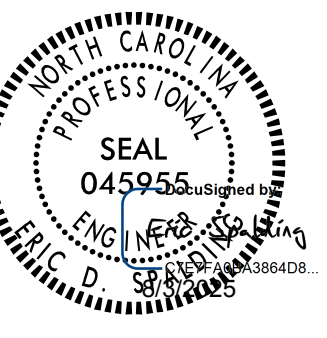
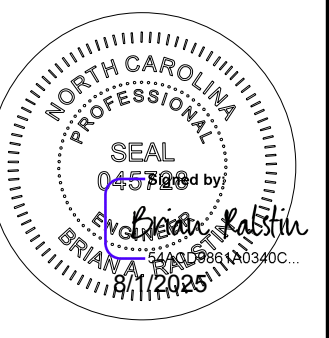
NC FIRM LICENSE No: F-1320
8000 REGENCY PARKWAY, STE 175
CARY, NC 27513
(919) 275-2490

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FINAL PAVEMENT SCHEDULE	
C1	3.0" S9.5C
C2	VAR S9.5C
D1	4.0" I19.0C
D2	VAR. I19.0C
E1	4.0" B25.0C
E2	VAR B25.0C
J	8" ABC
P	PRIME COAT
R	SBG
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	INCIDENTAL MILLING
W	VAR. (WEDGING)
Y	RUMBLE STRIPS

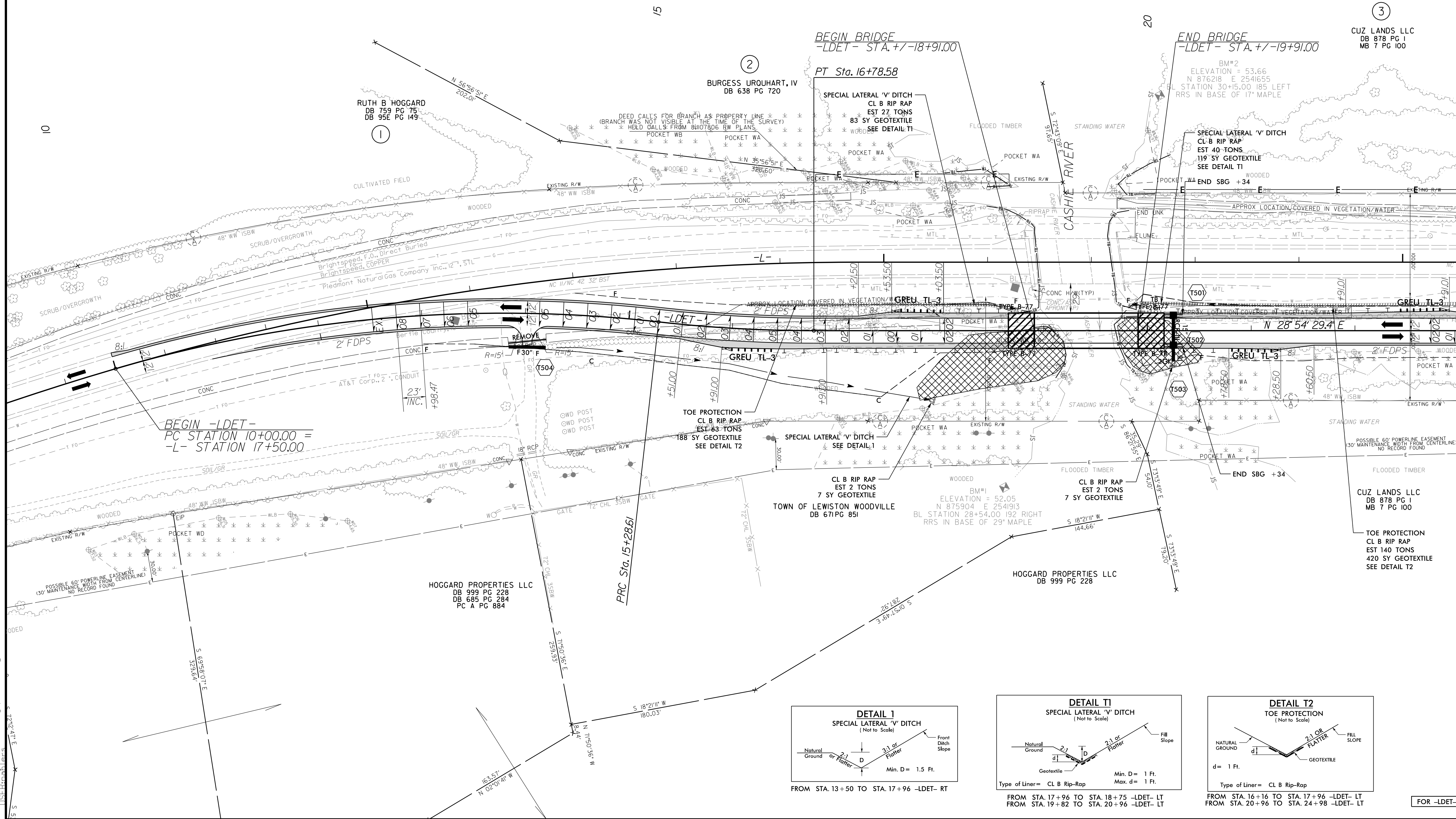
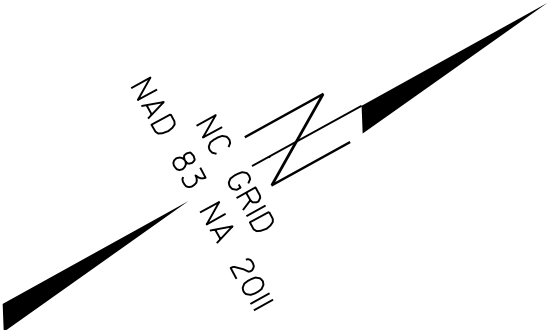
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

5/14/99

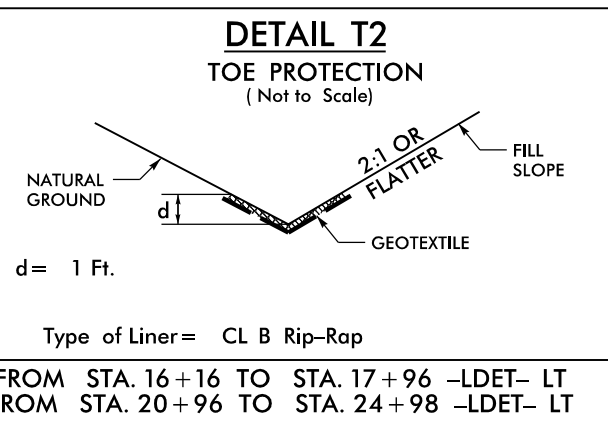
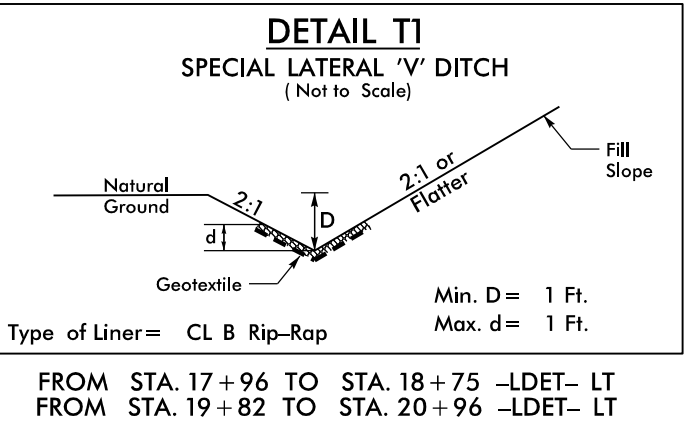
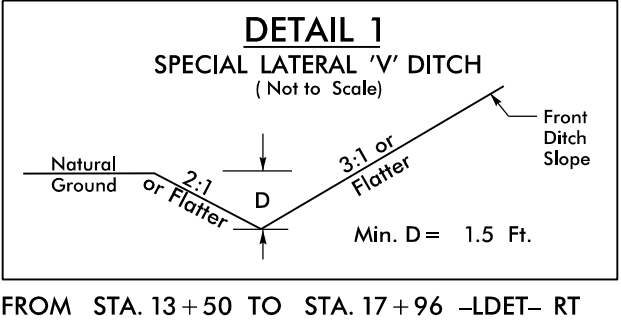
PROJECT REFERENCE NO. <i>BR-0153</i>		SHEET NO. <i>2B-1</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
		
NC FIRM LICENSE No: F-1320 8000 REGENCY PARKWAY, STE 175 CARY, NC 27513 (919) 275-2490		
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-LDET-

PI Sta 12+67.84 $\Delta = 22^\circ 46' 20.4" (RT)$ $D = 4' 18" 28.6"$ $L = 528.6'$ $T = 267.84'$ $R = 1,330.00'$ $Super = 0.05$ $LR = 115'$ $DS = 45 MPH$	PI Sta 16+03.68 $\Delta = 6^\circ 27' 38.8" (LT)$ $D = 4' 18" 28.6"$ $L = 149.97'$ $T = 75.07'$ $R = 1,330.00'$ $Super = 0.05$ $LR = 115'$ $DS = 45 MPH$
---	--



MATCH LINE -LDET- STA. 23+00
SEE SHEET 2B-2



FOR -LDET- PROFILE, SEE SHEET NO. 8

5/14/99

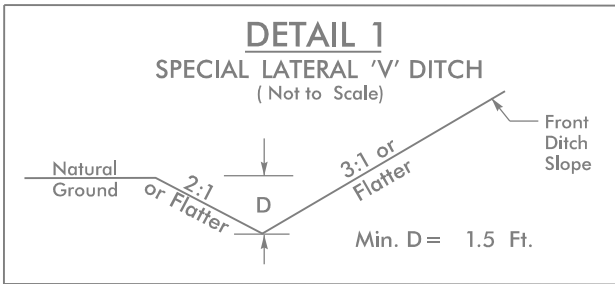
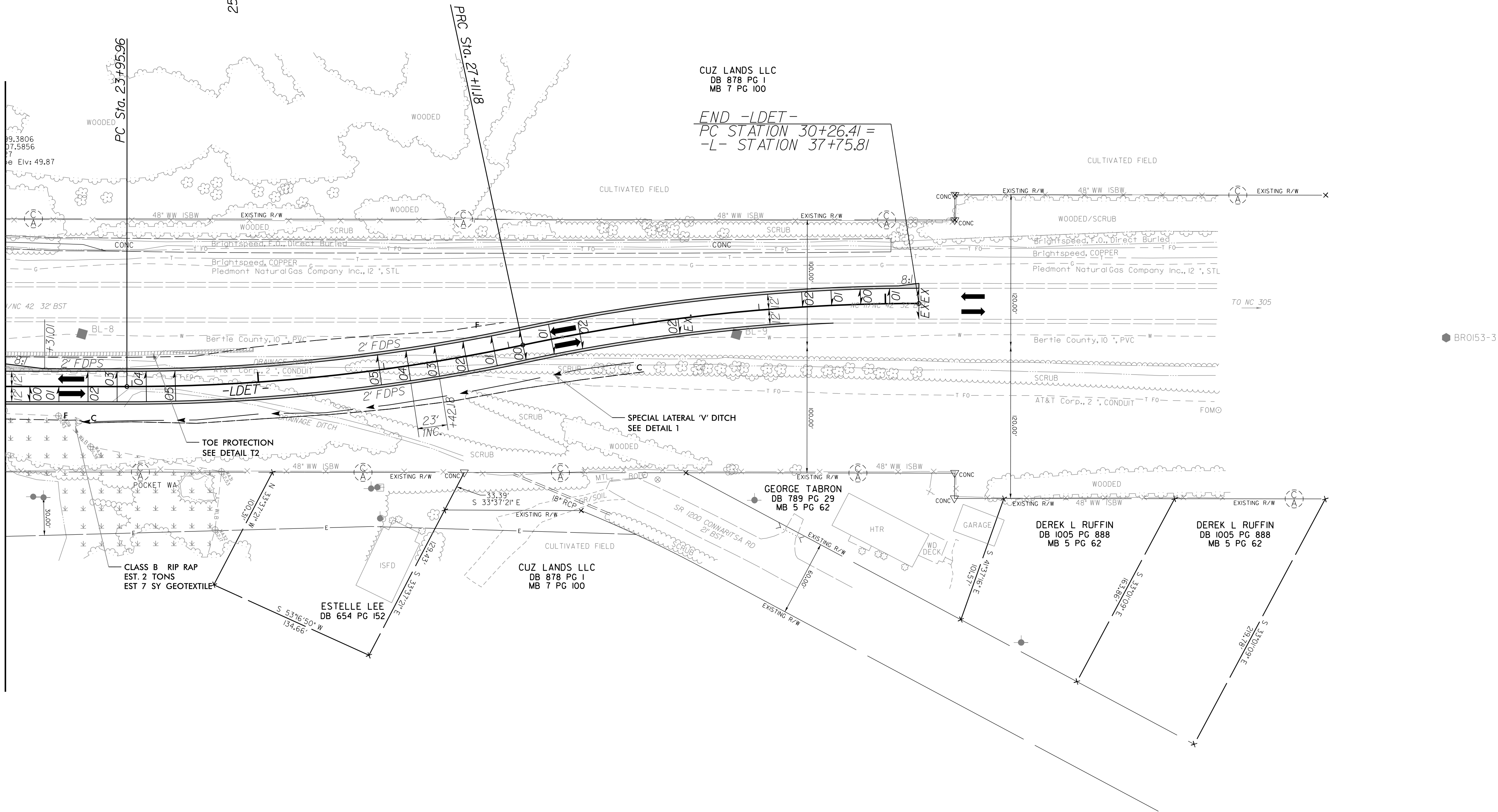
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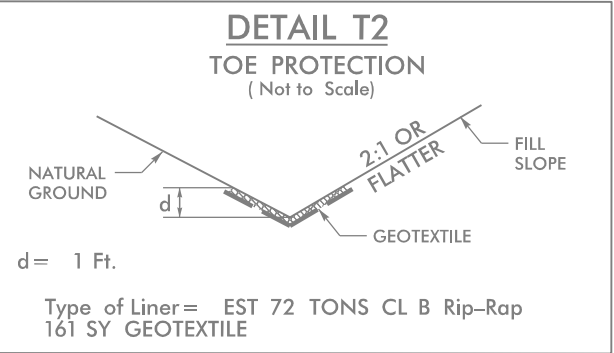
MATCH LINE -LDET- STA. 23+00
SEE SHEET 2B-1

-LDET-
PI Sta 25+54.16
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 $D = 3^{\circ} 49' 11.0''$
 $L = 315.22'$
 $T = 158.19'$
 $R = 1,500.00'$
 $Super = 0.05$
 $LR = 115'$
 $DS = 45$ MPH

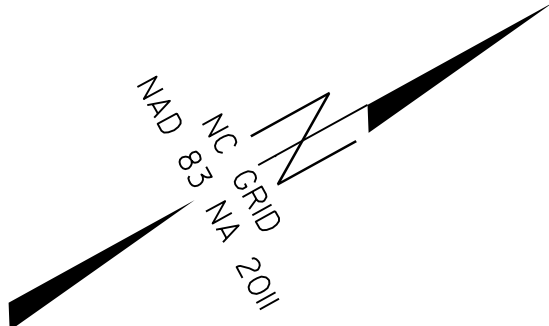
PI Sta 28+69.38
 $\Delta = 12^{\circ} 02' 26.2''$ (RT)
 $D = 3^{\circ} 49' 11.0''$
 $L = 315.22'$
 $T = 158.19'$
 $R = 1,500.00'$
 $Super = 0.05$
 $LR = 115'$
 $DS = 45$ MPH



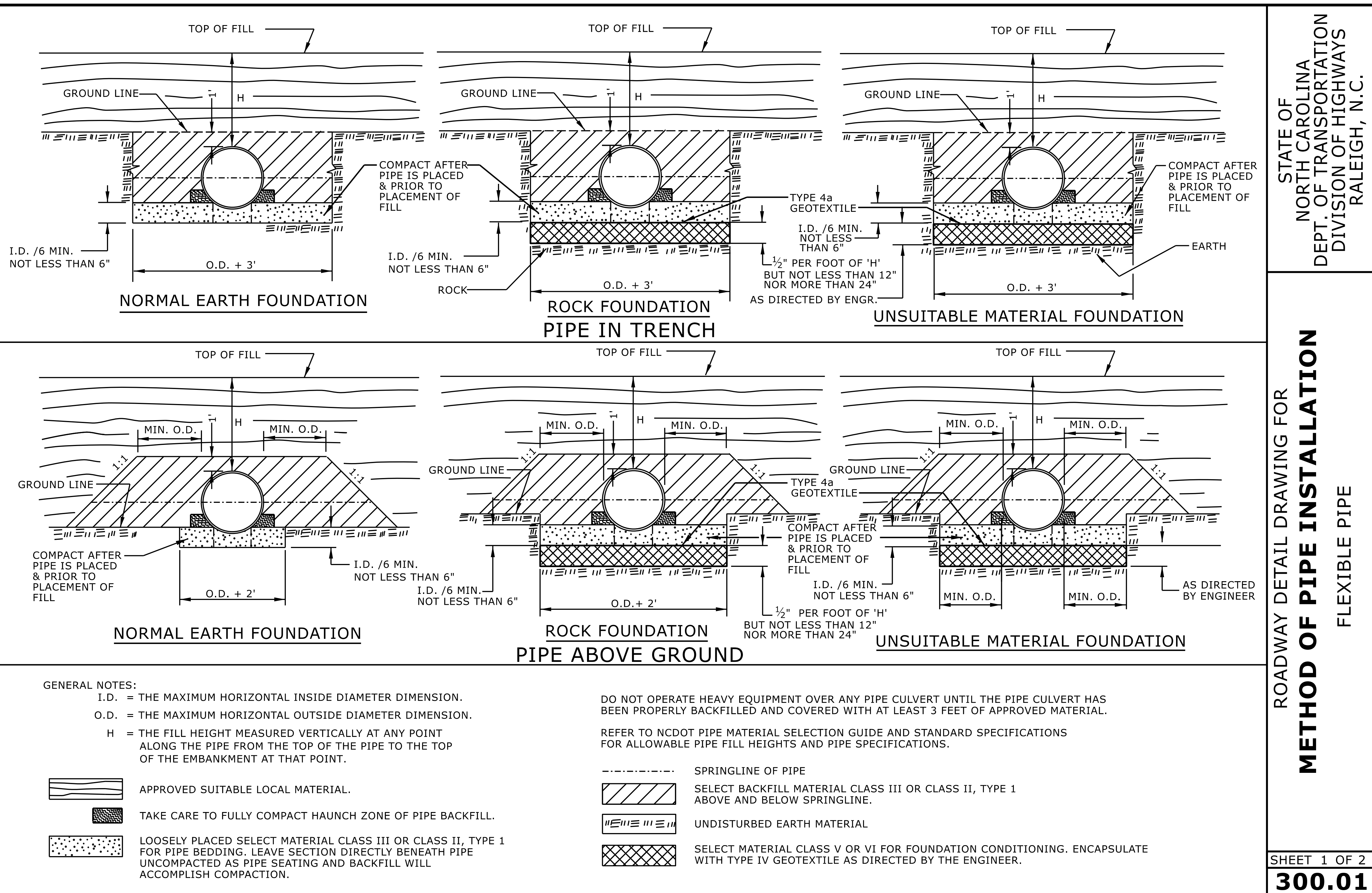
FROM STA. 13+50 TO STA. 17+96 -LDET- RT
FROM STA. 23+60 TO STA. 28+00 -LDET- RT



FROM STA. 16+16 TO STA. 17+96 -LDET- LT
FROM STA. 20+96 TO STA. 24+98 -LDET- LT



PROJECT REFERENCE NO.		SHEET NO.	
BR-0153		2B-2	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
		NC FIRM LICENSE No: F-1320 8000 REGENCY PARKWAY, STE 175 CARY, NC 27513 (919) 275-2490	
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**CONTRACTS STANDARDS
AND DEVELOPMENT UNIT**
919-707-6950 FAX 919-250-4

Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

ORIGINAL BY: S.CALHOUN DATE: 7-25-2024
 MODIFIED BY: _____ DATE: _____
 CHECKED BY: _____ DATE: _____
 FILE SPEC.: _____

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

ROADWAY DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
RIGID PIPE

SHEET 2 OF 2
300.01

TOP OF FILL

GROUND LINE

H

I.D. /6 MIN.
NOT LESS THAN 6"

O.D. + 3'

NORMAL EARTH FOUNDATION

TOP OF FILL

GROUND LINE

H

I.D. /6 MIN.
NOT LESS THAN 6"

O.D. + 3'

ROCK FOUNDATION
PIPE IN TRENCH

TOP OF FILL

GROUND LINE

H

I.D. /6 MIN.
NOT LESS THAN 6"

O.D. + 3'

UNSUITABLE MATERIAL FOUNDATION

TOP OF FILL

GROUND LINE

H

MIN. O.D.

O.D. + 2'

NORMAL EARTH FOUNDATION

TOP OF FILL

GROUND LINE

H

MIN. O.D.

O.D. + 2'

ROCK FOUNDATION
PIPE ABOVE GROUND

TOP OF FILL

GROUND LINE

H

MIN. O.D.

O.D. + 2'

UNSUITABLE MATERIAL FOUNDATION

COMPACT AFTER
PIPE IS PLACED
& PRIOR TO
PLACEMENT OF
FILL

TYPE 4a
GEOTEXTILE

I.D. /6 MIN.
NOT LESS
THAN 6"

1/2" PER FOOT OF 'H'
BUT NOT LESS THAN 12"
NOR MORE THAN 24"
AS DIRECTED BY ENGR.

EARTH

COMPACT AFTER
PIPE IS PLACED
& PRIOR TO
PLACEMENT OF
FILL

TYPE 4a
GEOTEXTILE

I.D. /6 MIN.
NOT LESS THAN 6"

1/2" PER FOOT OF 'H'
BUT NOT LESS THAN 12"
NOR MORE THAN 24"
AS DIRECTED BY ENGINEER

GENERAL NOTES:

I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.

O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.

H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT
ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP
OF THE EMBANKMENT AT THAT POINT.

APPROVED SUITABLE LOCAL MATERIAL.

TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1
FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE
UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL
ACCOMPLISH COMPACTION.

DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS
BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.

REFER TO NCDOT PIPE MATERIAL SELECTION GUIDE AND STANDARD SPECIFICATIONS
FOR ALLOWABLE PIPE FILL HEIGHTS AND PIPE SPECIFICATIONS.

SPRINGLINE OF PIPE

SELECT BACKFILL MATERIAL CLASS III OR CLASS II,
BELOW SPRINGLINE.

UNDISTURBED EARTH MATERIAL

SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE
WITH TYPE IV GEOTEXTILE AS DIRECTED BY THE ENGINEER.

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CONTRACTS STANDARDS
AND DEVELOPMENT UNIT

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SEE TITLE BLOCK

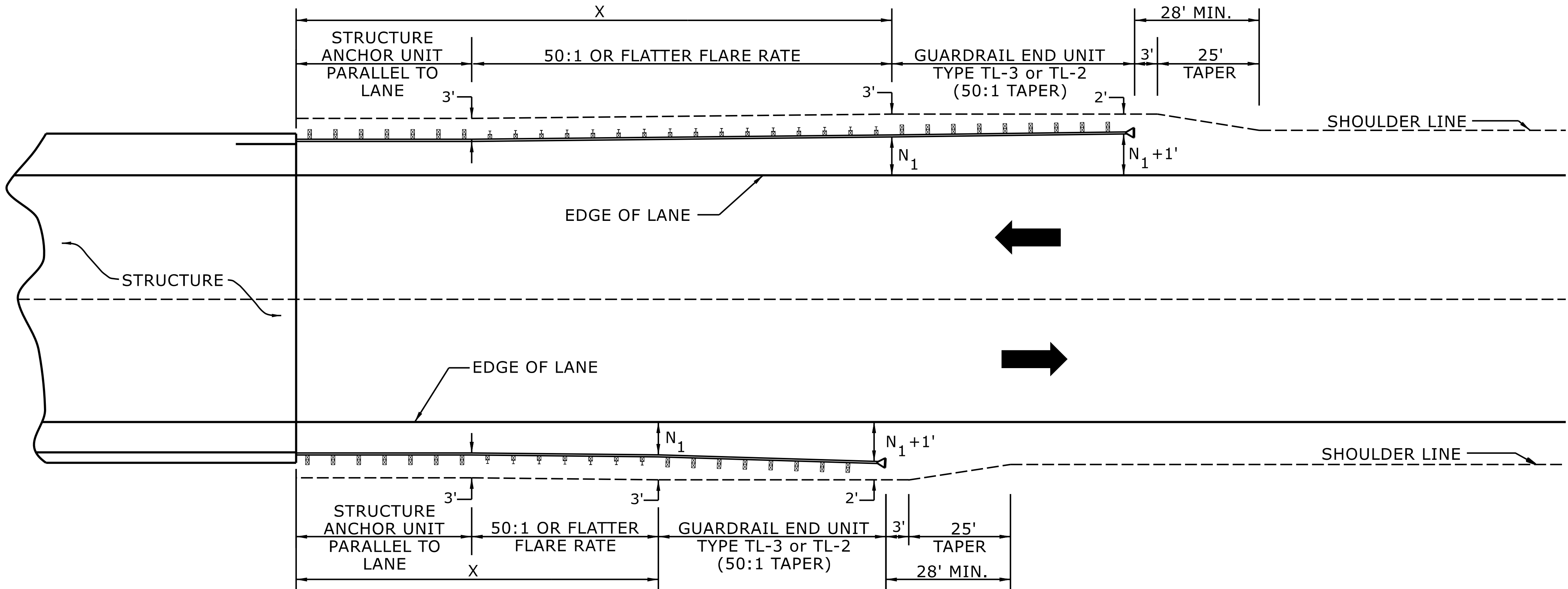
ORIGINAL BY: S.CALHOUN DATE: 7-25-2024

MODIFIED BY: DATE:

CHECKED BY: DATE:

FILE SPEC.: DATE:

PROJECT REFERENCE NO.	SHEET NO.
BR-0153	2C-3



USE FLARE RATE AS THE CONTROL IF THE "N₁" DISTANCE IS NOT OBTAINED.
("N₁" IS BASED ON SHOULDER WIDTHS IN THE ROADWAY DESIGN MANUAL)

SEE STD. 862.03 FOR STRUCTURE ANCHOR UNITS

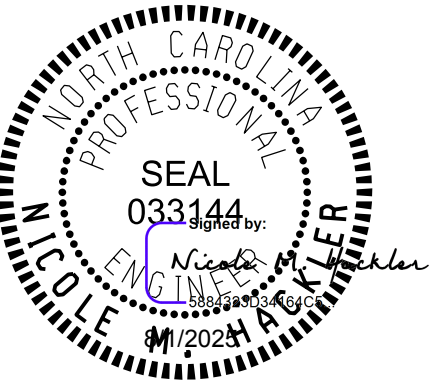
FOR POSTED SPEEDS ≥ 45MPH USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45MPH USE GREU TYPE TL-2

GUARDRAIL LENGTH OF NEED (X) IS CALCULATED BASED ON THE AASHTO ROADSIDE DESIGN GUIDE.

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 4 OF 15
862D01



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

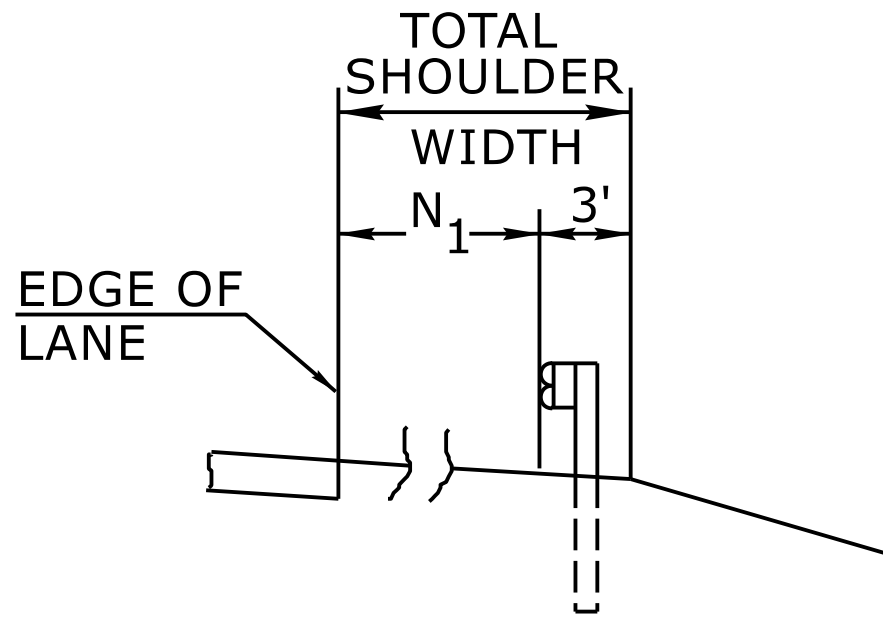
**CONTRACTS STANDARDS
AND DEVELOPMENT UNIT**

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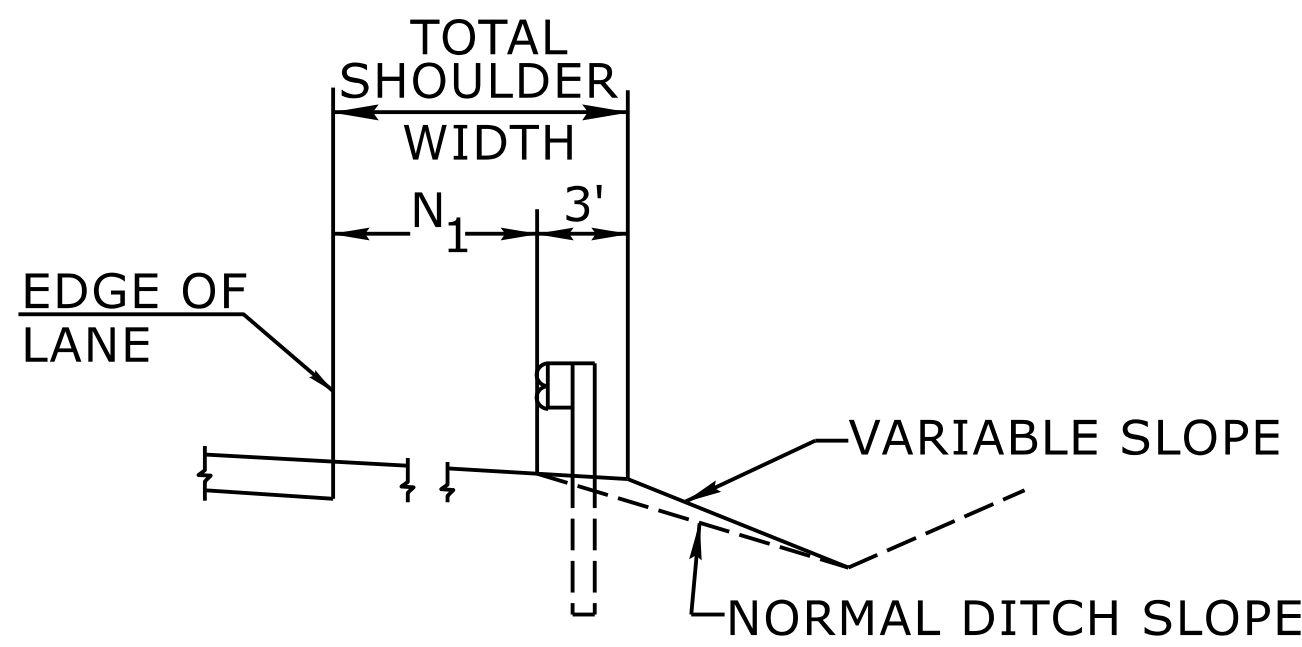
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ORIGINAL BY: S.CALHOUN DATE: 7-25-2024
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

PROJECT REFERENCE NO.	SHEET NO.
BR-0153	2C-4

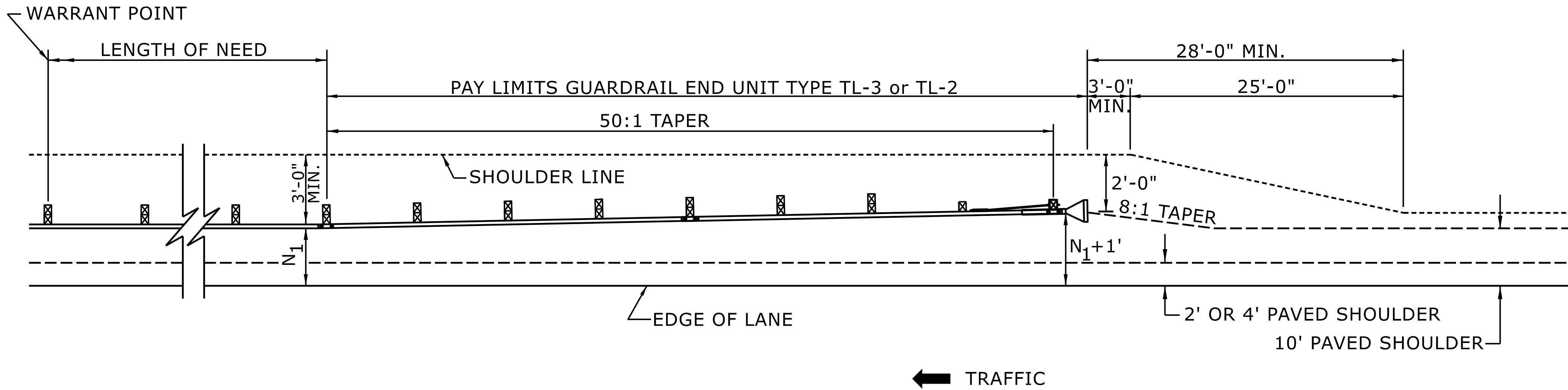


FILL SECTION



CUT SECTION

"N₁"= DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL WHERE GUARDRAIL IS PARALLEL TO LANE.



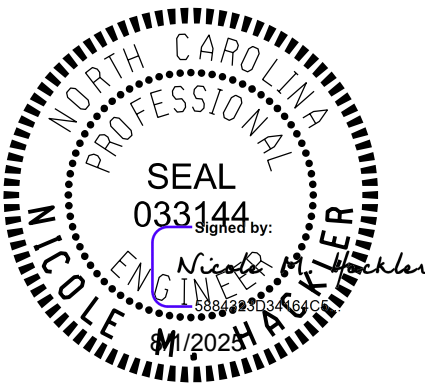
FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

DETAIL OF BEGINNING OF GUARDRAIL IN CUT OR FILL SECTION

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 6 OF 15
862D01



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

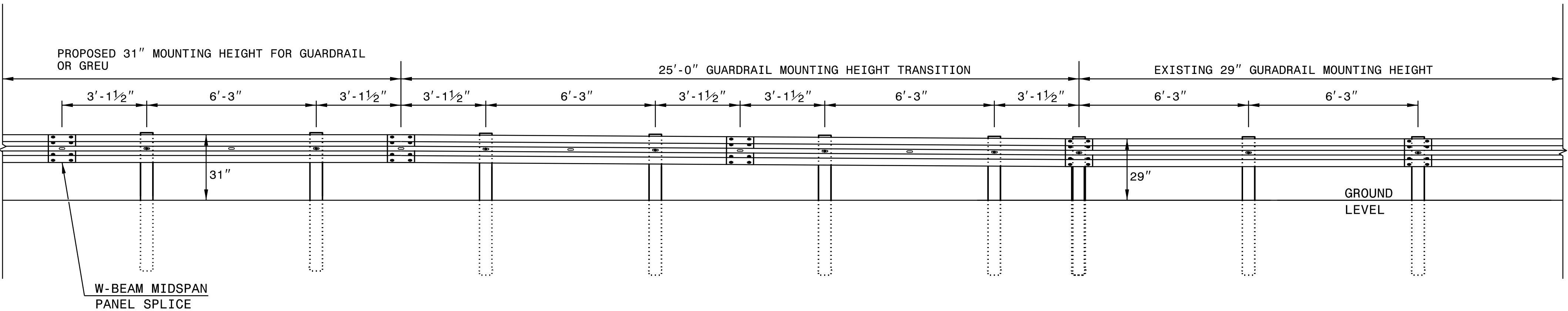
**CONTRACTS STANDARDS
AND DEVELOPMENT UNIT**
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ORIGINAL BY: S.CALHOUN DATE: 7-25-2024
MODIFIED BY: DATE:
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FILE SPEC.: DATE:

PROJECT REFERENCE NO.	SHEET NO.
BR-0153	2C-5

NOTE: IF EXISTING GUARDRAIL IS LOWER THAN 29", USE AN ADDITIONAL 12'-6" LONG SECTION OF GUARDRAIL,
FOR EVERY 1" OF HEIGHT DIFFERENCE, TO TRANSITION FROM EXISTING GUARDRAIL TO PROPOSED 31" GUARDRAIL.



ELEVATION VIEW

TRANSITION FROM 29" TO 31" W-BEAM GUARDRAIL MOUNTING HEIGHT

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 5 OF 9

862D02



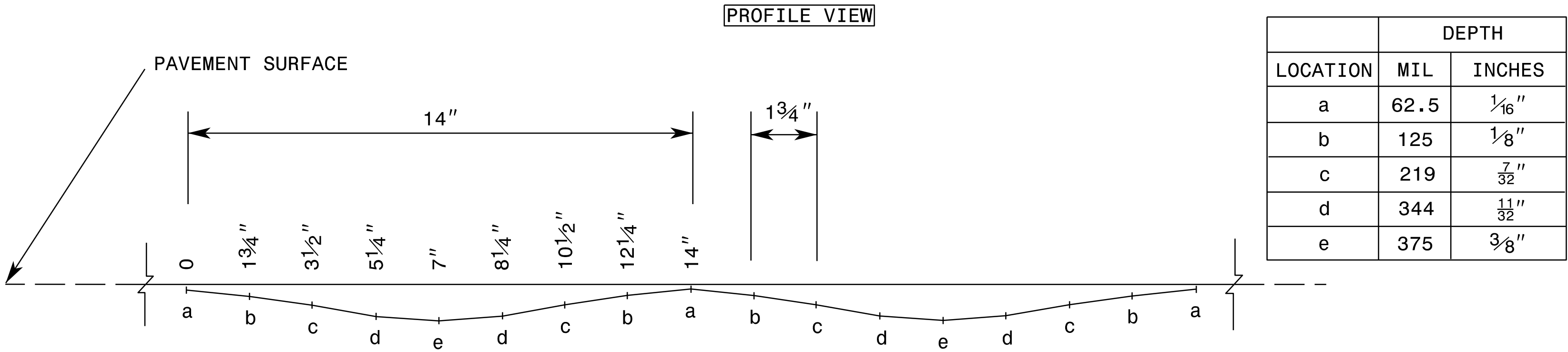
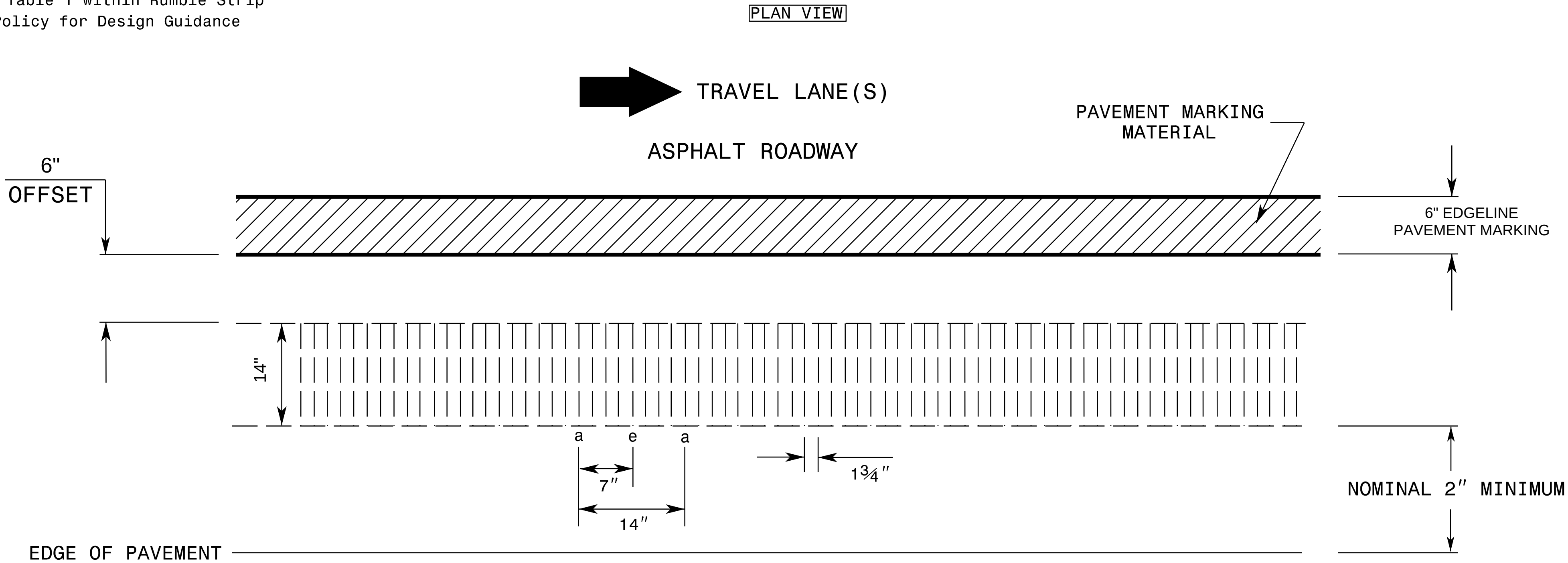
DOCUMENT NOT CONSIDERED FINAL
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**CONTRACTS STANDARDS
AND DEVELOPMENT UNIT**
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SEE TITLE BLOCK

ORIGINAL BY: K. Aldridge DATE: 02-25
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

See Table 1 within Rumble Strip
Policy for Design Guidance



LOCATION	DEPTH	
	MIL	INCHES
a	62.5	1/16"
b	125	1/8"
c	219	7/32"
d	344	11/32"
e	375	3/8"

REFERENCE DRAWING ID: Sin.Strip

NOTES:

1) Specification in table taken from MNDOT Research Project Final Report 2016-23: *Sinusoidal Rumble Strip Design Optimization Study By: Terhaar et. al, June 2016*

SHEET 2 OF 9



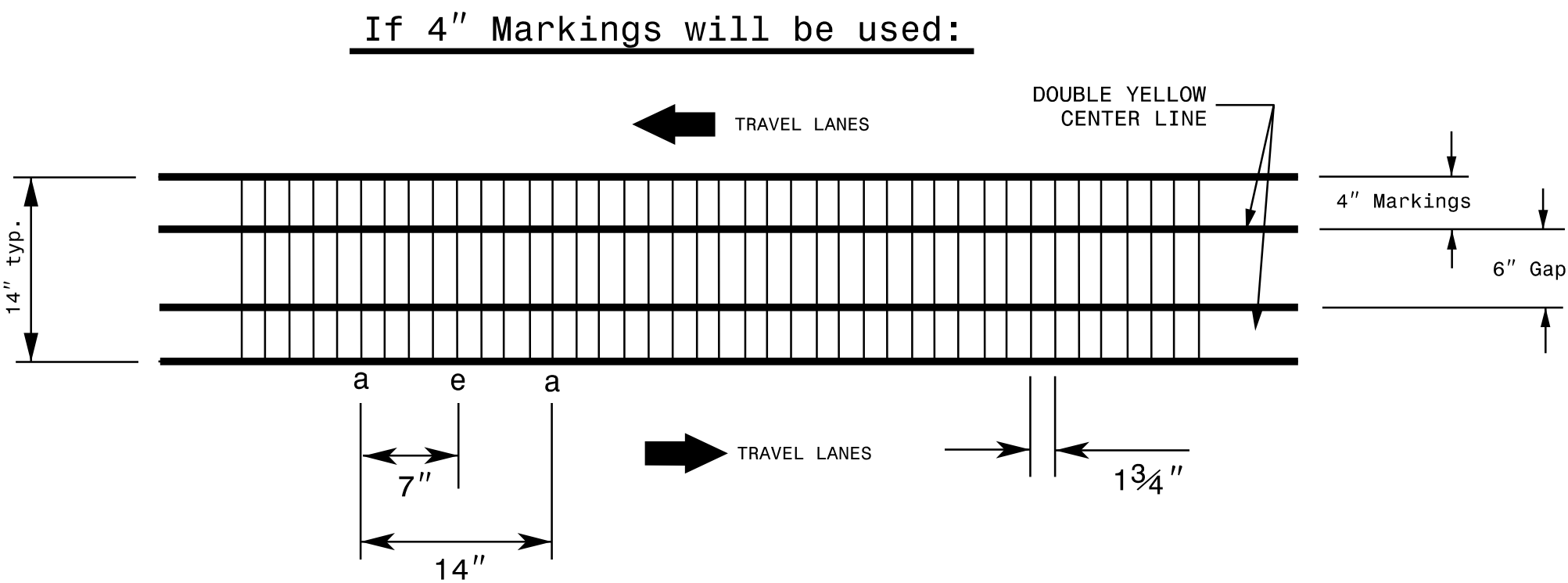
**CONTRACTS STANDARDS
AND DEVELOPMENT UNIT**
Office 919-707-8950 FAX 919-250-4119

SEE TITLE BLOCK

ORIGINAL BY: **C. SIMPSON** DATE: **04-24-2025**
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

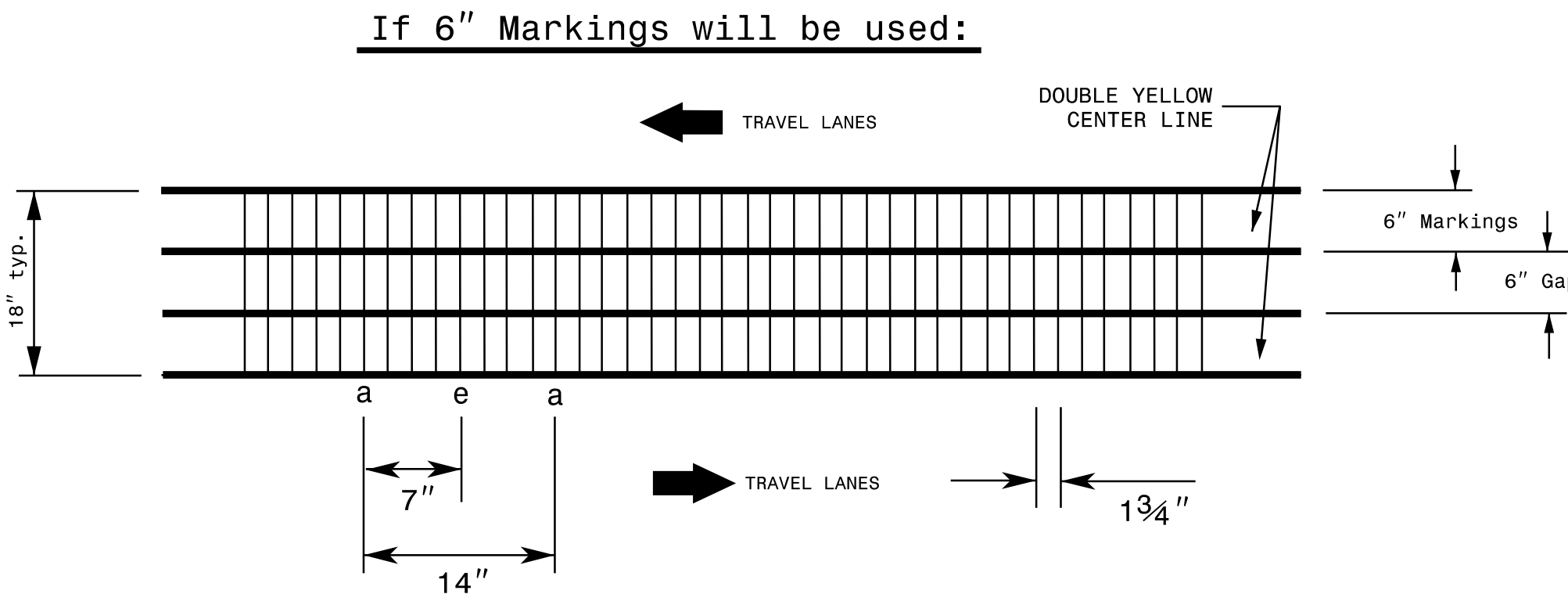
See Table 2 within Rumble Strip Policy for Design Guidance

Rumble Dimensions



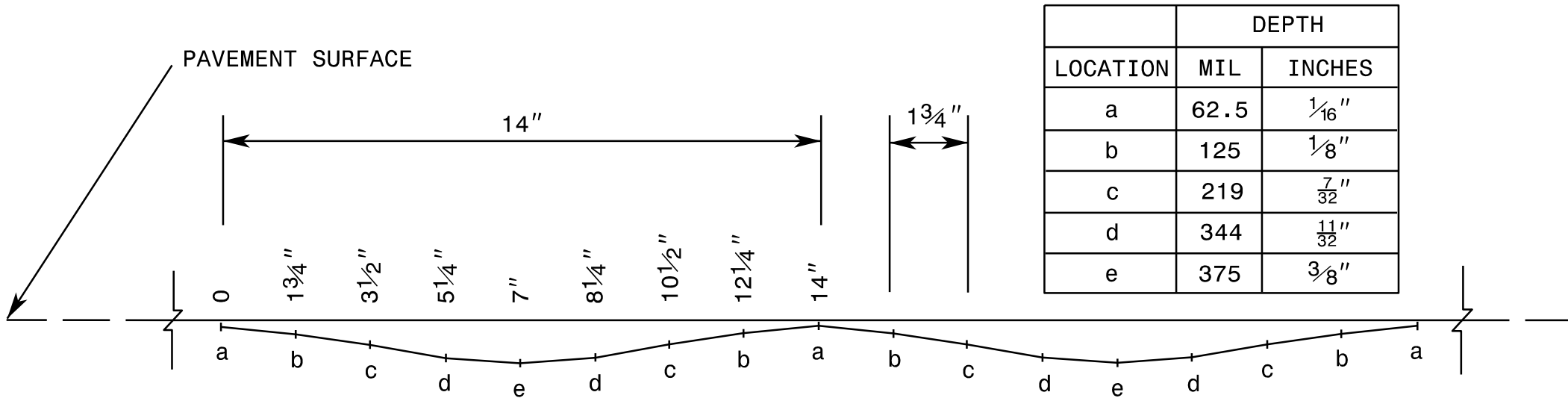
Markings Dimensions

Rumble Dimensions



Markings Dimensions

PROFILE:



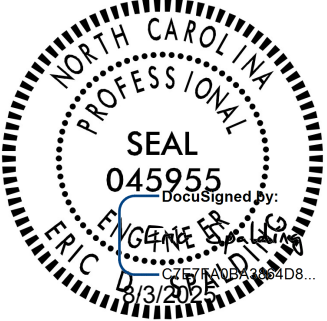
LOCATION	DEPTH	
	MIL	INCHES
a	62.5	1/16"
b	125	1/8"
c	219	7/32"
d	344	11/32"
e	375	3/8"

REFERENCE DRAWING ID: Sin.CL

NOTES:

- 1) Specification in table taken from MNDOT Research Project Final Report 2016-23: *Sinusoidal Rumble Strip Design Optimization Study By: Terhaar et. al, June 2016*
- 2) USING A VACUUM, REMOVE ALL DEBRIS FROM THE MILLINGS JUST PRIOR TO PLACING ANY PAVEMENT MARKINGS.
- 3) ENSURE GLASS BEADS ARE SPREAD UNIFORMLY OVER THE ENTIRE SURFACE OF THE PAVEMENT MARKING MATERIAL.

SHEET 6 OF 9

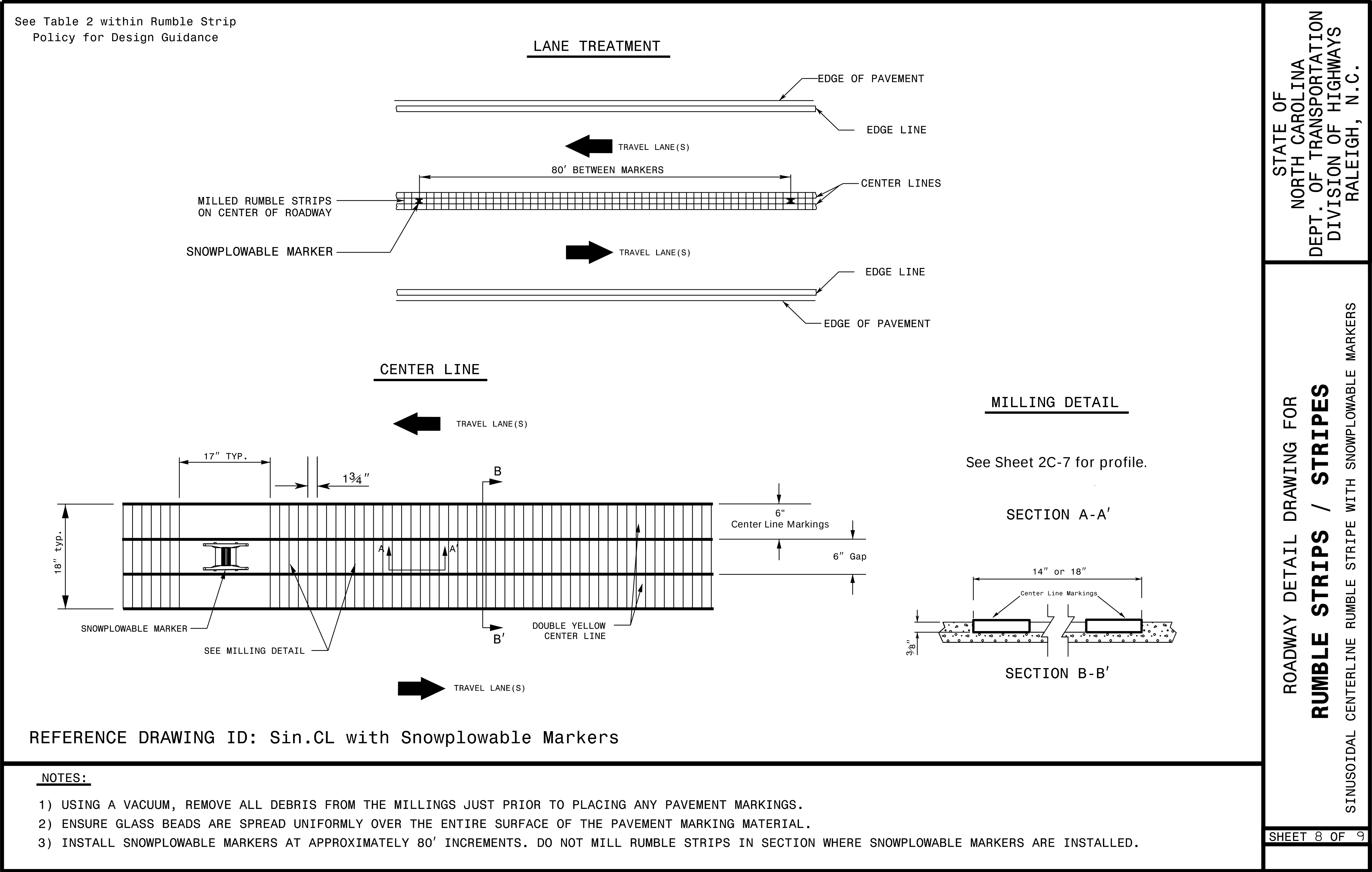


**CONTRACTS STANDARDS
AND DEVELOPMENT UNIT**
Office 919-707-8950 FAX 919-250-4119

SEE TITLE BLOCK

ORIGINAL BY: **C. SIMPSON** DATE: **04-24-2025**
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

PROJECT REFERENCE NO.	SHEET NO.
BR-0153	2C-8



PROJECT NO.	SHEET NO.
BR-0153	3B-1

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

PAVEMENT REMOVAL SUMMARY	
	IN SQUARE YARDS

SURVEY LINE	Station	Station	LOCATION LT/RT/CL	ASPHALT REMOVAL	ASPHALT BREAKUP	CONCRETE REMOVAL	CONCRETE BREAKUP
-LDET-	10+00	18+51	CL	1939.04			
-LDET-	20+01	30+26	CL	2699.14			
-L-	15+00	21+20	RT	89.03			
-L-	15+00	24+29	LT	299.43			
-L-	21+75	25+93	RT	10.24			
-L-	29+41	39+00	RT	129.82			
-L-	31+02	39+00	LT	189.79			
-L-	22+50	EXIST BRIDGE	CL		1411.97		
-L-	EXIST BRIDGE	33+40	CL		2155.34		
		TOTAL:		5356.51	3567.31		
		SAY:		5360	3570		

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	Station	Station	LOCATION LT/RT/CL	LENGTH			
-L-	27+73.00	27+96.46	LT	23.5			
-L-	27+73.00	27+96.46	RT	23.5			
+LDET-	20+16.00	20+34.00	LT	18			
-LDET-	20+16.00	20+34.00	RT	18			
		TOTAL:		83			
		SAY:		90			

SUMMARY OF EARTHWORK

Station	Station	Uncl. Excav.	Embank.	Borrow	Waste
-LDET- STA. 12+49.97	-LDET- STA. 18+91.00	306	3,238	2,932	
-LDET- STA. 19+91.00	-LDET- STA. 27+99.73	193	2,158	1,965	
Phase I Subtotals:		499	5,395	4,896	0
-L- STA. 15+00.00	-L- STA. 26+18.00	511	3,581	3,070	
-L- STA. 27+48.00	-L- STA. 40+00.00	260	5,515	5,255	
Phase II Subtotals:		771	9,096	8,325	0
-L- STA. 15+00.00	-L- STA. 26+45.04	973	386	0	587
-L- STA. 27+45.04	-L- STA. 40+00.00	687	701	14	
ADDITIONAL DETOUR EXCAVATION		767	6	0	761
Phase III Subtotals:		2,427	1,093	14	1,348
SUBTOTALS:		3,697	15,584	13,235	1,348
Material for Shoulder Construction			1275	1275	
Waste in Lieu of Borrow				-14	-14
Est. 5% To Replace Top Soil on Borrow Pit				725	
PROJECT TOTALS:		3,697	16,859	15,221	1,334
PROJECT TOTALS:		3,697	16,859	15,221	1,334
SAY:		3,800		15,300	

Note: Earthwork quantities are calculated by Benesch. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

ADDITIONAL UNDERCUT (CONTINGENCY) = 300 CY
SELECT GRANULAR MATERIAL (CONTINGENCY) = 300 CY
GEOTEXTILE FOR SOIL STABILIZATION (CONTINGENCY) = 300 SY

COMPUTED BY:		JM	DATE:	4/9/2024	
CHECKED BY:			DATE:		

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
GUARDRAIL SUMMARY

G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

[illegible]

COMPUTED BY: Tyler C. Bottoms DATE: 12/18/23
CHECKED BY: Thein Tun Zan DATE: 12/20/2023

(2-3-23)

PROJECT NO.	SHEET NO.
BR-0153	3G-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
CONTINGENCY				SD	200
				TOTAL LF:	200

*UD = Underdrain
*BD = Blind Drain
*SD = Subsurface Drain

5/14/99

\$\$\$\$SYTIME\$\$\$\$
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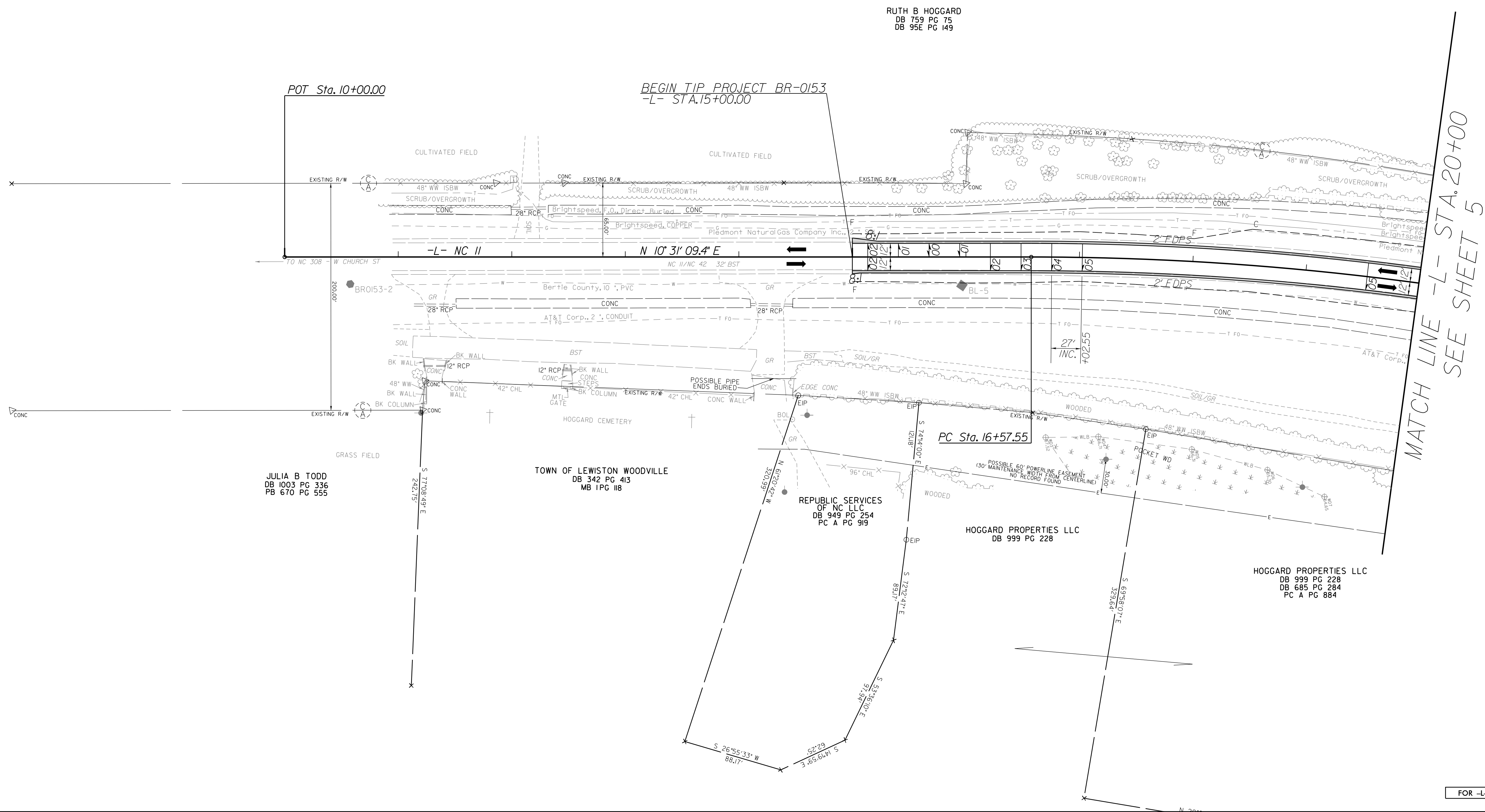
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	5	RUTH B HOGGARD
2	5	BURGESS URQUHART, IV
3	5	CUZ LANDS LLC

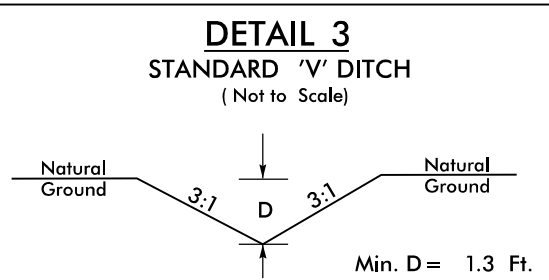
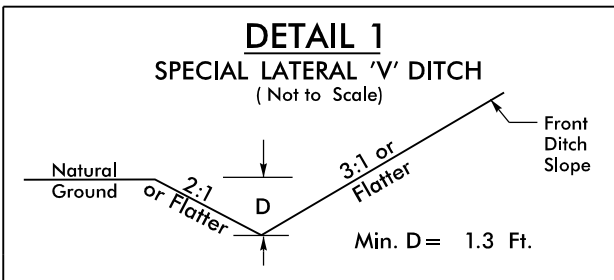
PROJECT REFERENCE NO.	SHEET NO.
BR-0153	3P-1

FOR -L- PROFILE, SEE SHEET NO. 7



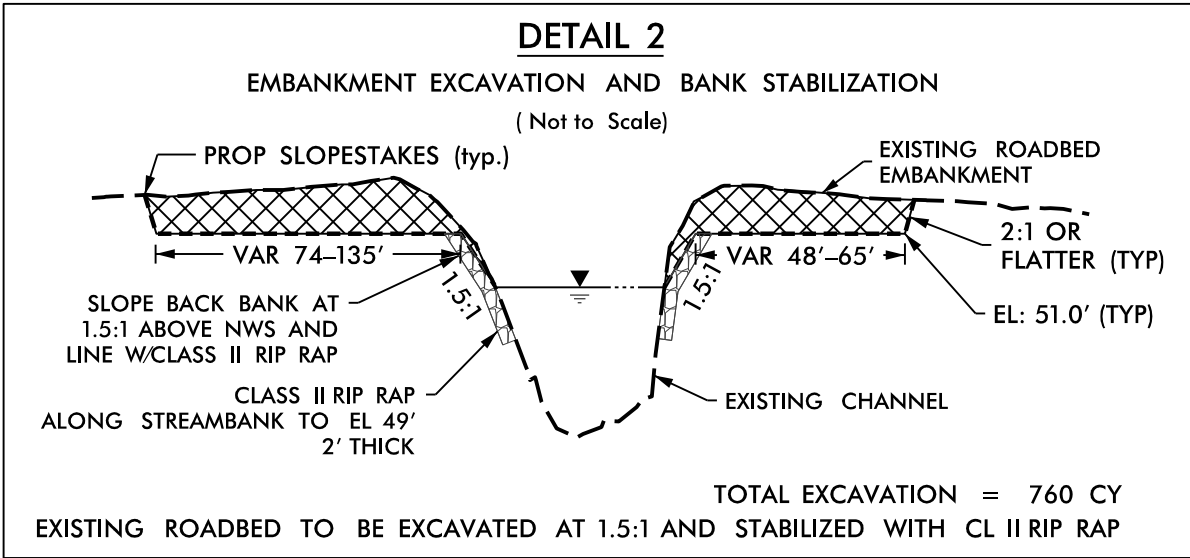
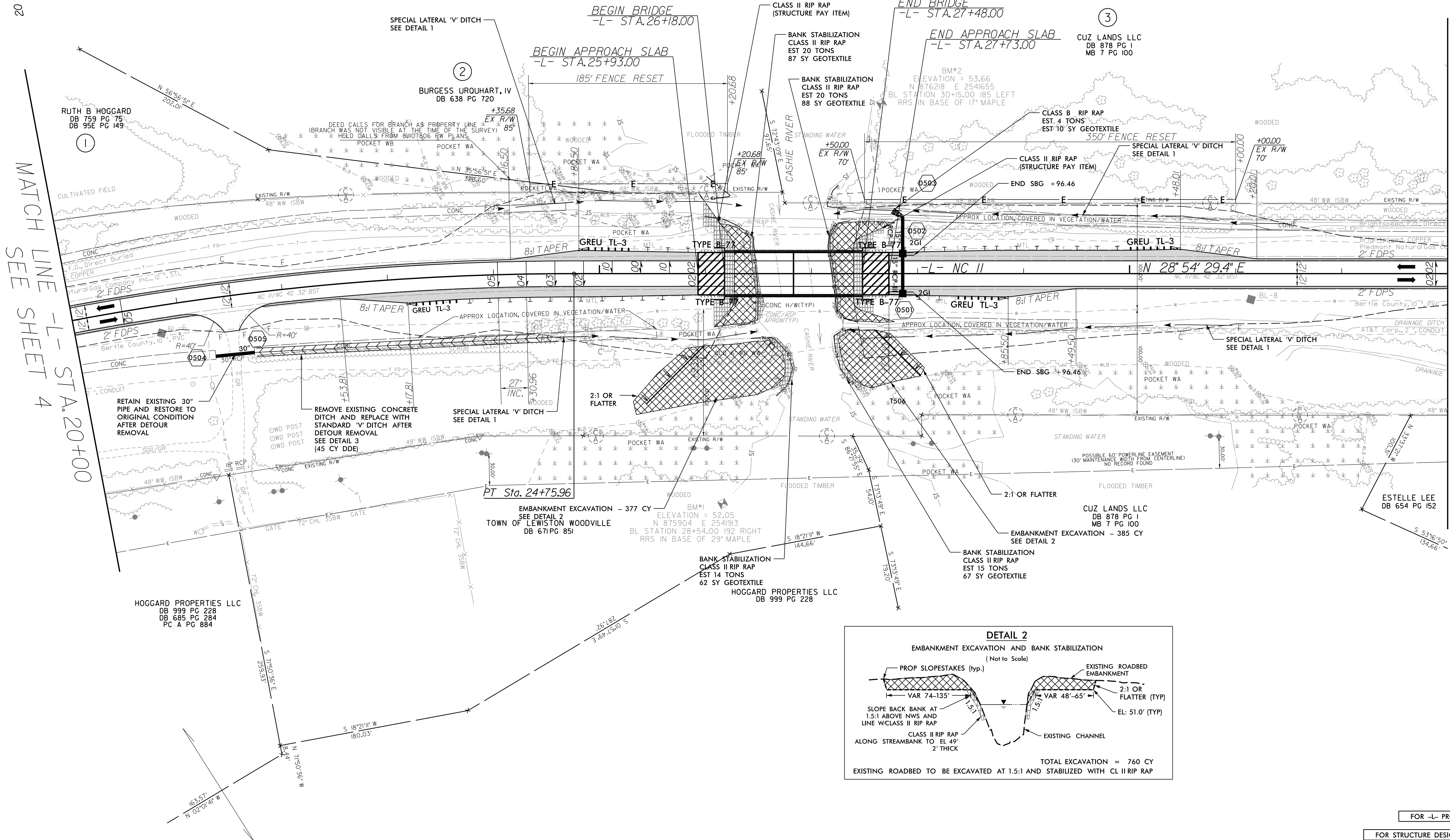
5/14/99
\$\$\$\$SYTIME\$\$\$\$
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-L-
PI Sta 20+70.30
 $\Delta = 18^{\circ} 23' 20.0''$ (RT)
 $D = 2^{\circ} 14' 48.8''$
 $L = 818.41'$
 $T = 412.76'$
 $R = 2,550.00'$
 $Super = 0.05$
 $LR = 135'$
 $DS = 60$



FROM STA. 24+00 TO STA. 26+38 -L- LT
FROM STA. 24+50 TO STA. 26+50 -L- RT
FROM STA. 27+20 TO STA. 31+50 -L- LT
FROM STA. 27+30 TO STA. 31+00 -L- RT

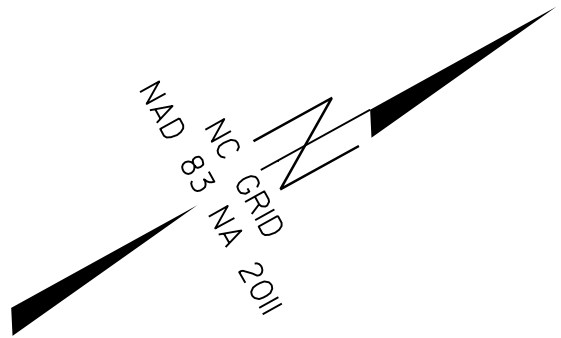
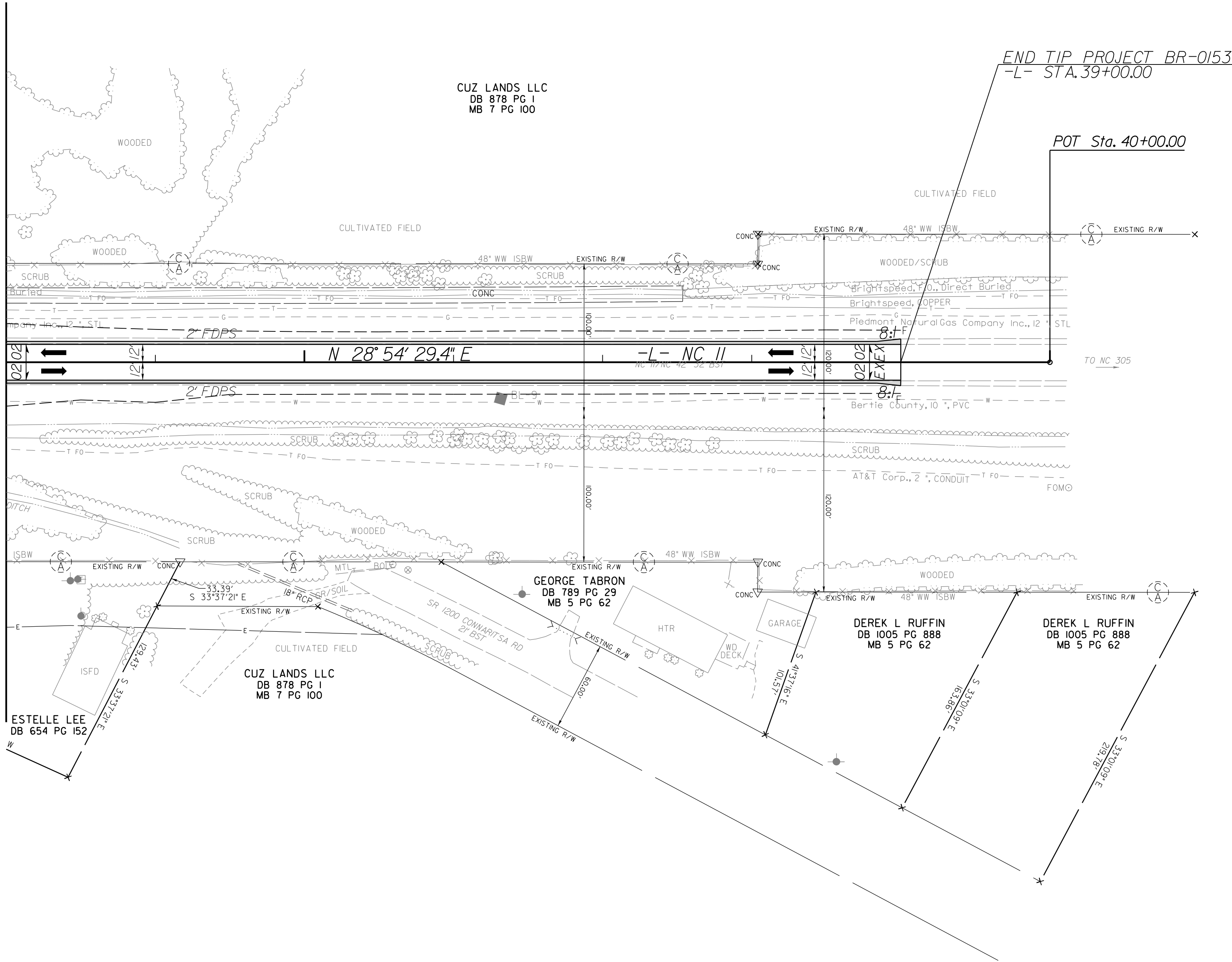
FROM STA. 21+67 TO STA. 24+50 -L- RT
SLOPE: -0.8%

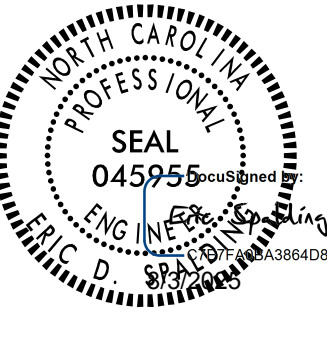


PROJECT REFERENCE NO. BR-0153		SHEET NO. 5
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER
 NC FIRM LICENSE No: F-1320 8000 REGENCY PARKWAY, STE 175 CARY, NC 27513 (984) 275-2490		
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5/14/2011
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\$\$\$\$PLOT\$\$\$\$
\$\$\$\$PRINTER\$\$\$\$

MATCH LINE -L- STA.33+00
SEE SHEET 5



PROJECT REFERENCE NO. <i>BR-0153</i>		SHEET NO. 6
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER 	
 NC FIRM LICENSE No: F-1320 8000 REGENCY PARKWAY, STE 175 CARY, NC 27513 (919) 275-2490		
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

