

TIP PROJECT: BR-0152

CONTRACT: C204979

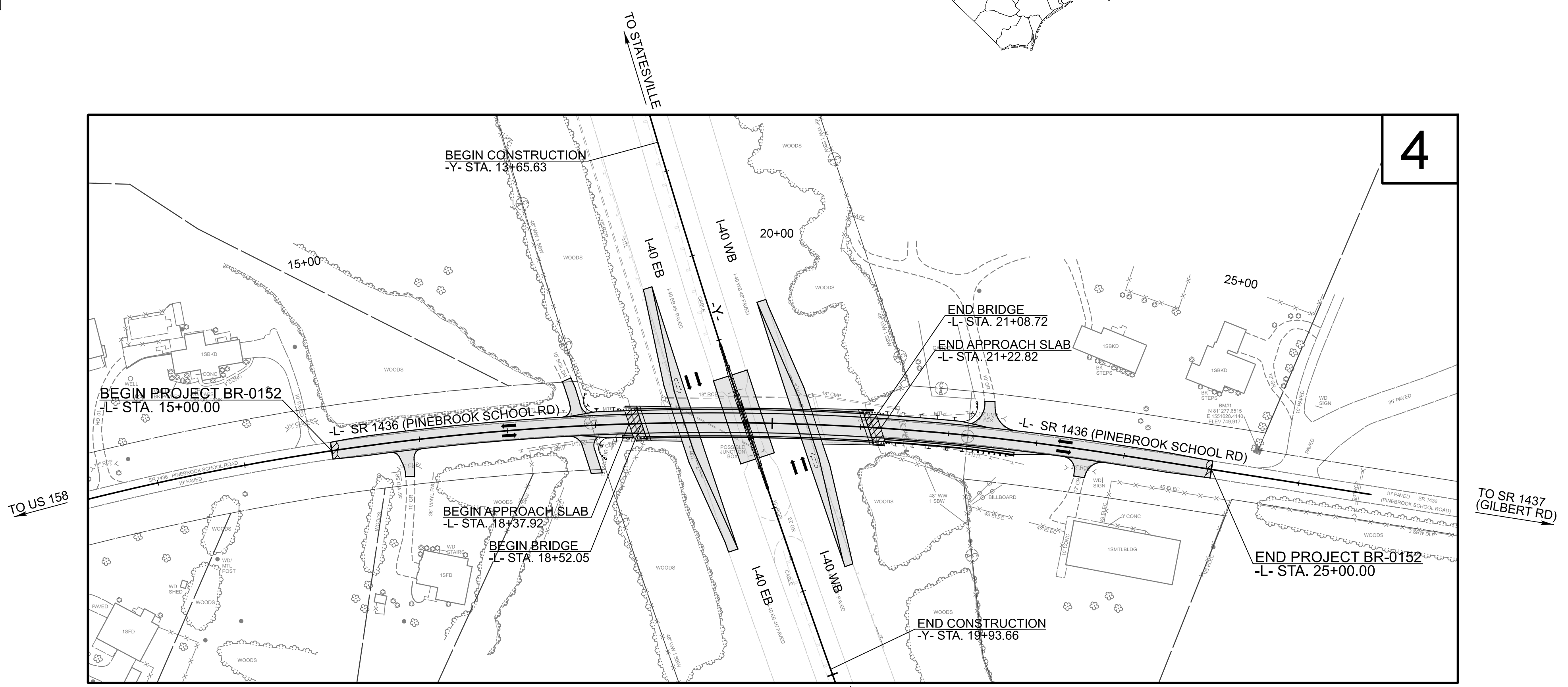
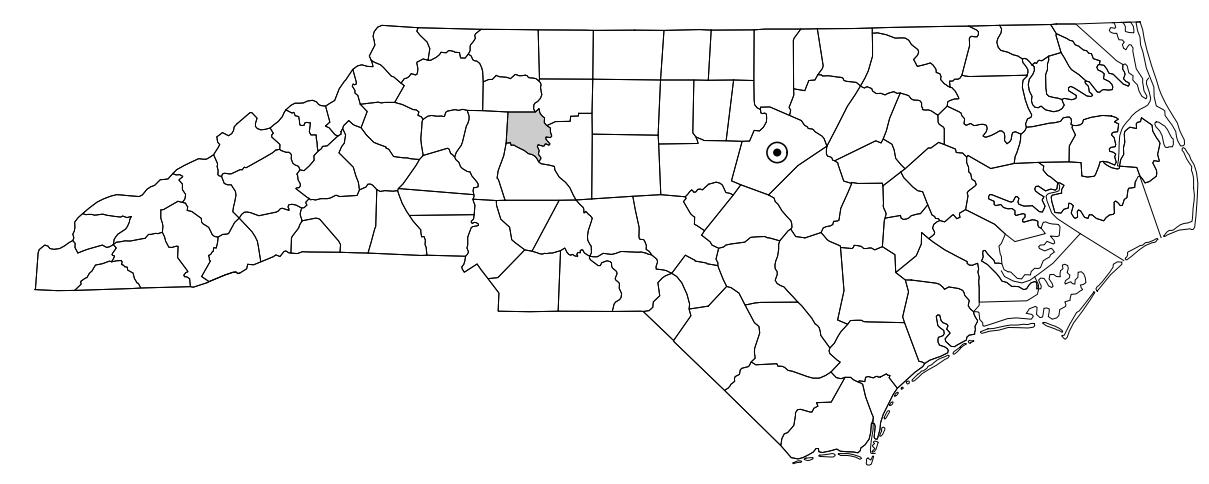
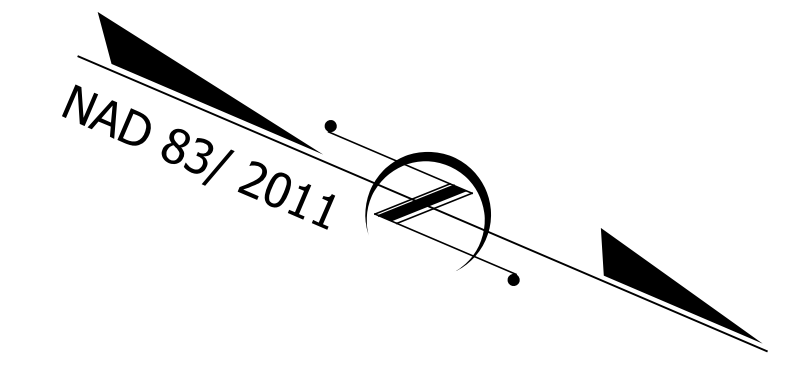
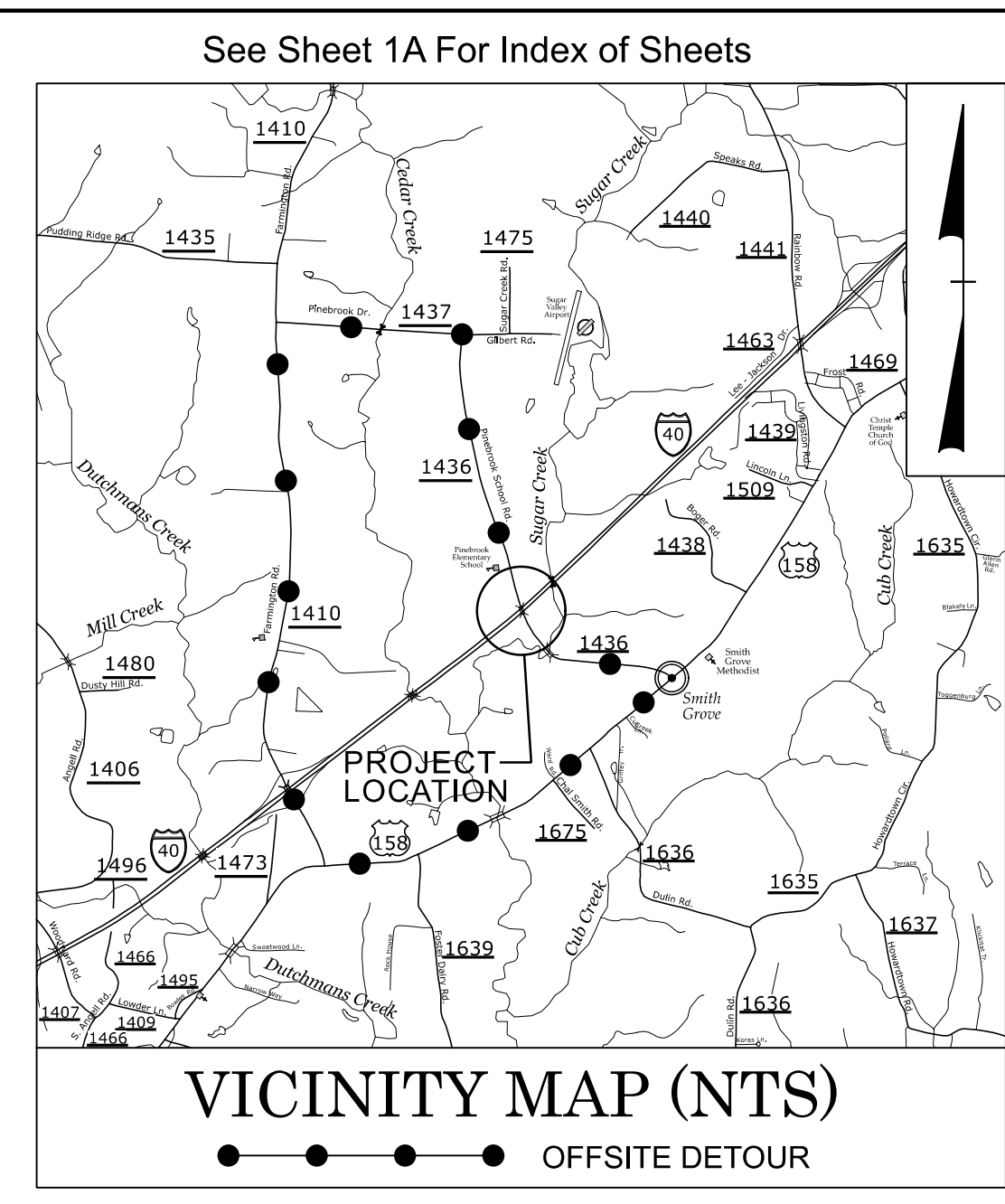
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0152	1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
67152.1.1		P.E.	
67152.2.1		ROW	
51600.3.1	5160001	CONST.	

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

DAVIE COUNTY

LOCATION: *REPLACEMENT OF BRIDGE NO. 76 ON SR 1436
(PINEBROOK SCHOOL RD)*

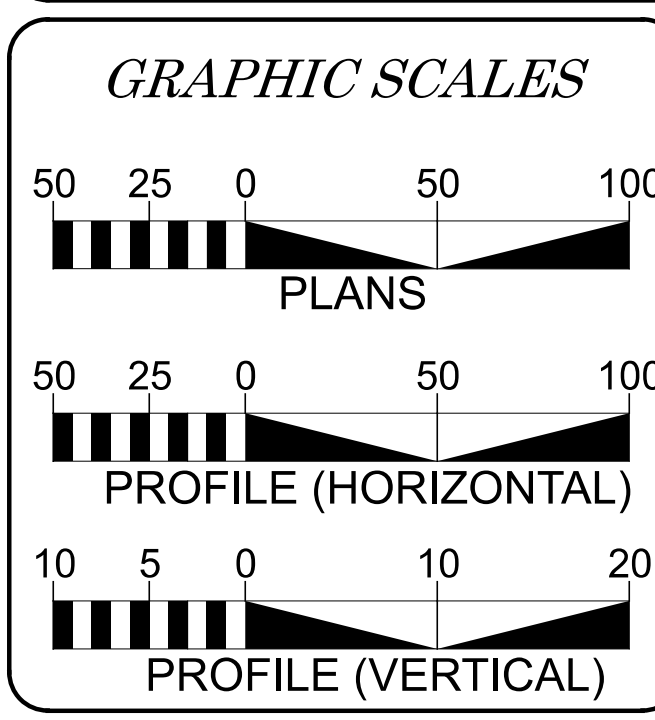
TYPE OF WORK: *GRADING, DRAINAGE, PAVING, AND STRUCTURE*



4

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

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



DESIGN DATA

ADT 2025 =	1,173
ADT 2045 =	1,400
K =	30% - 8%
D =	60% - 70%
T =	4%*
V =	50 MPH
* TTST =	1% DUAL = 3%
FUNC CLASS =	LOCAL
	REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT BR-0152	= 0.140 MILES
LENGTH STRUCTURES TIP PROJECT BR-0152	= 0.049 MILES
TOTAL LENGTH TIP PROJECT BR-0152	= 0.189 MILES

PLANS PREPARED BY:
wsp
434 FAYETTEVILLE ST. #1500
RALEIGH, N.C. 27601
NC ENG F-0165
2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JANUARY 22, 2024

LETTING DATE:
FEBRUARY 18, 2025

PLANS PREPARED FOR:
DIVISION OF HIGHWAYS
DIVISION 9

375 SILAS CREEK PARKWAY
WINSTON SALEM, NC 27127

W. CRAIG PARKER, PE
PROJECT ENGINEER

BRIAN R. PEASE, EI
PROJECT DESIGN ENGINEER

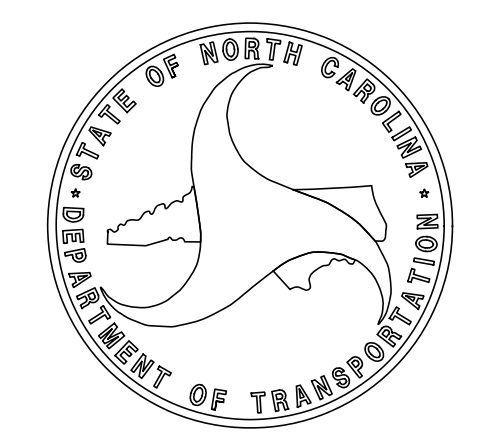
JEREMY L. KEATON, PE
NCDOT CONTACT:
DIVISION 9 BRIDGE PROJECT MANAGER

HYDRAULICS ENGINEER

Signed by:
James O. Britt
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

DocuSigned by:
W. Craig Parker, PE
SIGNATURE: P.E.



INDEX OF SHEETS

2024 ROADWAY ENGLISH STANDARD DRAWINGS
EFFECTIVE: 01-16-2024
REVISED:

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

SHEET NUMBER	SHEET	STD.NO.	TITLE
1	TITLE SHEET		
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS		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:
1B	CONVENTIONAL SYMBOLS		
2A-1 AND 2A-2	PAVEMENT SCHEDULE AND TYPICAL SECTIONS; DETAILS FOR WEDGING, SHOULDER BERM GUTTER, MILLING & SHOULDER DRAINS.		
2C-1	METHOD OF PIPE INSTALLATION (RIGID PIPE) - DETAIL IN LIEU OF STANDARD		
2C-2 AND 2C-3	GUARDRAIL PLACEMENT - DETAILS IN LIEU OF STANDARDS		
3B-1	ROADWAY SUMMARIES FOR EARTHWORK, GUARDRAIL, PAVEMENT REMOVAL, & SHOULDER BERM GUTTER		
3D-1	DRAINAGE SUMMARY		
3G-1	GEOTECHNICAL SUMMARIES		
4	PLAN AND PROFILE SHEET		
RW-1 THRU RW-04	SURVEY CONTROL, EXISTING CENTERLINES, RIGHT OF WAY, EASEMENTS, AND PROPERTY TIES		
TMP-1 THRU TMP-9	TRAFFIC MANAGEMENT PLANS		
PMP-1 THRU PMP-2	PAVEMENT MARKING PLANS		
EC-1 THRU EC-5	EROSION CONTROL PLANS		
SIGN-1 THRU SIGN-5	SIGNING PLANS		
X-INDEX	CROSS-SECTION SHEET INDEX		
X-1A	CROSS-SECTION SUMMARY		
X-1 THRU X-14	-L- CROSS-SECTIONS		
X-15 THRU X-23	-Y- CROSS-SECTIONS		
S-1 THRU S-42	STRUCTURES PLANS		
		DIVISION 2 - EARTHWORK	
		200.03	METHOD OF CLEARING - METHOD III
		225.01	GUIDE FOR GRADING SUBGRADE - INTERSTATE AND FREEWAY
		225.02	GUIDE FOR GRADING SUBGRADE - SECONDARY AND LOCAL
		225.04	METHOD OF OBTAINING SUPERELEVATION - TWO LANE PAVEMENT
		225.05	METHOD OF OBTAINING SUPERELEVATION - DIVIDED HIGHWAYS
		225.09	GUIDE FOR SHOULDER AND DITCH TRANSITION AT GRADE SEPARATIONS
		DIVISION 3 - PIPE CULVERTS	
		300.01	METHOD OF PIPE INSTALLATION (USE DETAILS IN LIEU OF STANDARDS FOR SHEETS 1 AND 2 OF 2)
		310.10	DRIVEWAY PIPE CONSTRUCTION
		DIVISION 4 - MAJOR STRUCTURES	
		423.01	BRIDGE APPROACH FILLS - TYPE 1 APPROACH FILL FOR BRIDGE ABUTMENT
		DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
		560.01	METHOD OF SHOULDER CONSTRUCTION - HIGH SIDE OF SUPERELEVATED CURVE - METHOD I
		560.02	METHOD OF SHOULDER CONSTRUCTION - HIGH SIDE OF SUPERELEVATED CURVE - METHOD II
		DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
		610.03	GUIDE FOR PAVING SHOULDERS UNDER BRIDGES - METHOD III
		665.01	ASPHALT SHOULDERS - MILLED RUMBLE STRIPS
		DIVISION 8 - INCIDENTALS	
		816.01	CONCRETE PADS - FOR SHOULDER DRAIN INSTALLATION
		816.02	AGGREGATE SHOULDER DRAIN
		816.04	MARKERS FOR DRAINAGE STRUCTURE AND CONCRETE PAD
		840.00	CONCRETE BASE PAD FOR DRAINAGE STRUCTURES
		840.18	CONCRETE GRATED DROP INLET TYPE 'B' - 12" THRU 36" PIPE
		840.19	CONCRETE GRATED DROP INLET TYPE 'D' - 12" THRU 36" PIPE
		840.20	FRAMES AND WIDE SLOT FLAT GRATES
		840.22	FRAMES AND WIDE SLOT SAG GRATES
		840.24	FRAMES AND NARROW SLOT SAG GRATES
		840.25	ANCHORAGE FOR FRAMES - BRICK OR CONCRETE OR PRECAST
		840.27	BRICK GRATED DROP INLET TYPE 'B' - 12" THRU 36" PIPE
		840.28	BRICK GRATED DROP INLET TYPE 'D' - 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
		846.01	CONCRETE CURB, GUTTER AND CURB & GUTTER
		846.04	DROP INLET INSTALLATION IN SHOULDER BERM GUTTER
		848.04	STREET TURNOUT
		854.06	MEDIAN HAZARD PROTECTION
		857.01	PRECAST REINFORCED CONCRETE BARRIER - 41" SINGLE FACED
		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
		865.01	CABLE GUIDERAIL
		866.02	WOVEN WIRE FENCE - WITH WOOD POST
		876.02	GUIDE FOR RIP RAP AT PIPE OUTLETS

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 III.

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NOS. 225.04 & 225.05 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. NOS. 560.01 & 560.02.

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.

SHOULDER DRAINS:

SHOULDER DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 816.02 AND DETAILS IN PLANS AT LOCATIONS DIRECTED BY THE ENGINEER.

STREET TURNOUT:

STREET RETURNS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 848.04 USING THE RADII NOTED ON PLANS.

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.

BR-0152

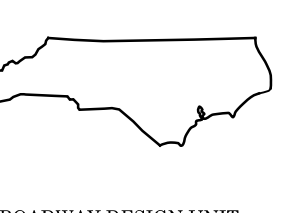
4RDI IA

ROADWAY DESIGN ENGINEER



STATE OF NORTH CAROLINA

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



ROADWAY DESIGN UNIT

PREPARED BY
WSP

434 FAYETTEVILLE ST. #1500
RALEIGH, N.C. 27601
NC ENG P-0165

Note: Not to Scale

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS CONVENTIONAL PLAN SHEET SYMBOLS

BR-0152
4R01 | IB

BOUNDARIES AND PROPERTY:

State Line	_____
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin (EIP)	○ EIP
Computed Property Corner	✕
Existing Concrete Monument (ECM)	◻ ECM
Parcel / Sequence Number	⑫③
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	▣
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	-WLB-
Proposed Wetland Boundary	-WLB-
Existing Endangered Animal Boundary	-EAB-
Existing Endangered Plant Boundary	-EPB-
Existing Historic Property Boundary	-HPB-
Known Contamination Area: Soil	-SC-S-
Potential Contamination Area: Soil	-SP-S-
Known Contamination Area: Water	-SW-W-
Potential Contamination Area: Water	-SP-W-
Contaminated Site: Known or Potential	☠ ?

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	○ S
Well	○ W
Small Mine	✕
Foundation	▣
Area Outline	▭
Cemetery	▣ †
Building	▣
School	▣
Church	▣
Dam	▣

HYDROLOGY:

Stream or Body of Water	_____
Hydro, Pool or Reservoir	▭
Jurisdictional Stream	-JS-
Buffer Zone 1	-BZ 1-
Buffer Zone 2	-BZ 2-
Flow Arrow	←
Disappearing Stream	→
Spring	○
Wetland	⌵
Proposed Lateral, Tail, Head Ditch	← FLOW
False Sump	◊

RAILROADS:

Standard Gauge	_____
RR Signal Milepost	○ MILEPOST 35
Switch	▣ 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	-C-
Proposed Slope Stakes Fill	-F-
Proposed Curb Ramp	CR
Existing Metal Guardrail	T T T T
Proposed Guardrail	T T T T
Existing Cable Guiderail	▣ ▣ ▣
Proposed Cable Guiderail	▣ ▣ ▣
Equality Symbol	⊕
Pavement Removal	⊠

VEGETATION:

Single Tree	☼
Single Shrub	☼
Hedge	~~~~~

Woods Line	_____
Orchard	☼ ☼ ☼ ☼
Vineyard	▣ Vineyard

EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	CONC
Bridge Wing Wall, Head Wall and End Wall	CONC WW
MINOR:	
Head and End Wall	CONC HW
Pipe Culvert	_____
Footbridge	_____
Drainage Box: Catch Basin, DI or JB	CB
Paved Ditch Gutter	_____
Storm Sewer Manhole	⊕
Storm Sewer	S

UTILITIES:

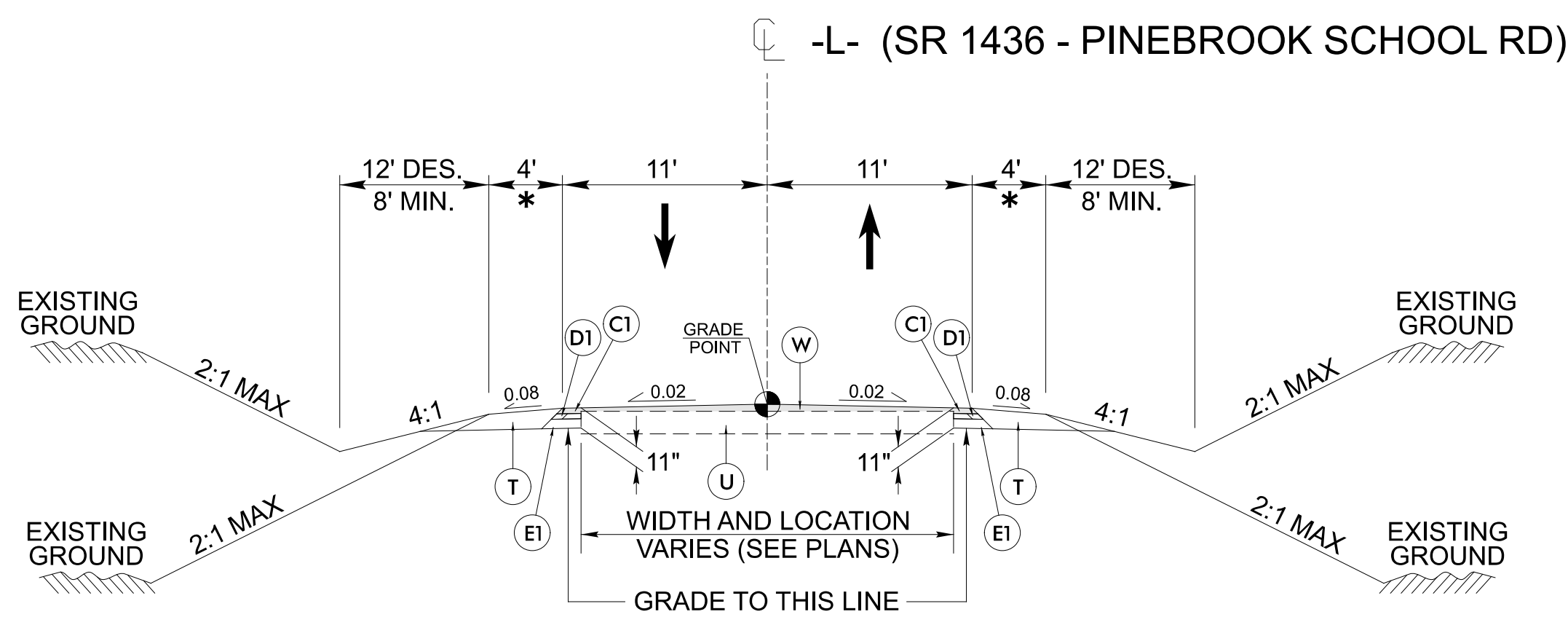
* SUE - Subsurface Utility Engineering
LOS - Level of Service - A, B, C or D (Accuracy)

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	PH
H-Frame Pole	●
U/G Power Line Test Hole (SUE - LOS A)*	⊕
U/G Power Line (SUE - LOS B)*	-----P-----
U/G Power Line (SUE - LOS C)*	-----P-----
U/G Power Line (SUE - LOS D)*	-----P-----

TELEPHONE:

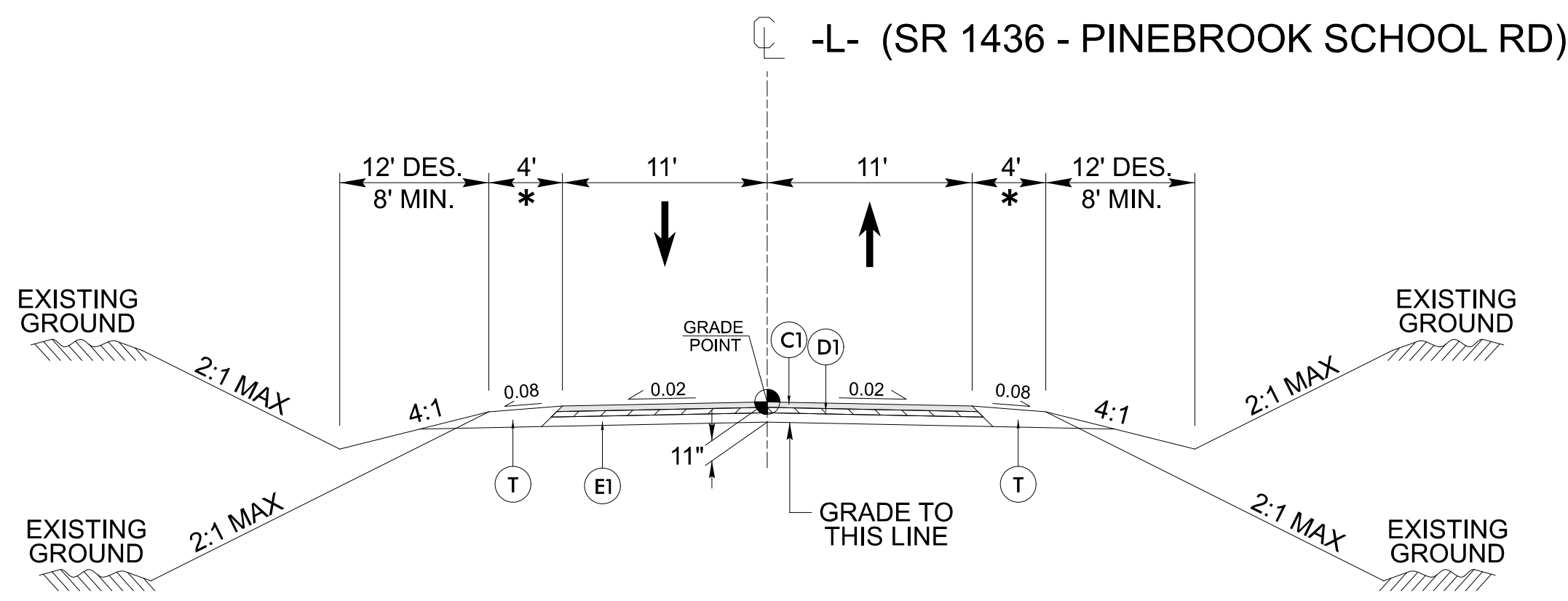
Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	⊕
Telephone Pedestal	⊠
Telephone Cell Tower	⊠
U/G Telephone Cable Hand Hole	PH
U/G Telephone Test Hole (SUE - LOS A)*	⊕
U/G Telephone Cable (SUE - LOS B)*	-----T-----
U/G Telephone Cable (SUE - LOS C)*	-----T-----
U/G Telephone Cable (SUE - LOS D)*	-----T-----
U/G Telephone Conduit (SUE - LOS B)*	-----TC-----
U/G Telephone Conduit (SUE - LOS C)*	-----TC-----
U/G Telephone Conduit (SUE - LOS D)*	-----TC-----
U/G Fiber Optics Cable (SUE - LOS B)*	-----TF-----
U/G Fiber Optics Cable (SUE - LOS C)*	-----TF-----
U/G Fiber Optics Cable (SUE - LOS D)*	-----TF-----

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)*	-----W-----
U/G Water Line (SUE - LOS C)*	-----W-----
U/G Water Line (SUE - LOS D)*	-----W-----
Above Ground Water Line	-----A/G Water-----
TV:	
TV Pedestal	⊠
TV Tower	⊗
U/G TV Cable Hand Hole	PH
U/G TV Test Hole (SUE - LOS A)*	⊕
U/G TV Cable (SUE - LOS B)*	-----TV-----
U/G TV Cable (SUE - LOS C)*	-----TV-----
U/G TV Cable (SUE - LOS D)*	-----TV-----
U/G Fiber Optic Cable (SUE - LOS B)*	-----TF-----
U/G Fiber Optic Cable (SUE - LOS C)*	-----TF-----
U/G Fiber Optic Cable (SUE - LOS D)*	-----TF-----
GAS:	
Gas Valve	◇
Gas Meter	◇
U/G Gas Line Test Hole (SUE - LOS A)*	⊕
U/G Gas Line (SUE - LOS B)*	-----G-----
U/G Gas Line (SUE - LOS C)*	-----G-----
U/G Gas Line (SUE - LOS D)*	-----G-----
Above Ground Gas Line	-----A/G Gas-----
SANITARY SEWER:	
Sanitary Sewer Manhole	⊕
Sanitary Sewer Cleanout	⊕
U/G Sanitary Sewer Line	-----SS-----
Above Ground Sanitary Sewer	-----A/G Sanitary Sewer-----
SS Force Main Line Test Hole (SUE - LOS A)*	⊕
SS Force Main Line (SUE - LOS B)*	-----FSS-----
SS Force Main Line (SUE - LOS C)*	-----FSS-----
SS Force Main Line (SUE - LOS D)*	-----FSS-----
MISCELLANEOUS:	
Utility Pole	●
Utility Pole with Base	⊠
Utility Located Object	○
Utility Traffic Signal Box	⊠
Utility Unknown U/G Line (SUE - LOS B)*	-----?UTL-----
U/G Tank; Water, Gas, Oil	▣
Underground Storage Tank, Approx. Loc.	UST
A/G Tank; Water, Gas, Oil	▣
Geoenvironmental Boring	⊕
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.



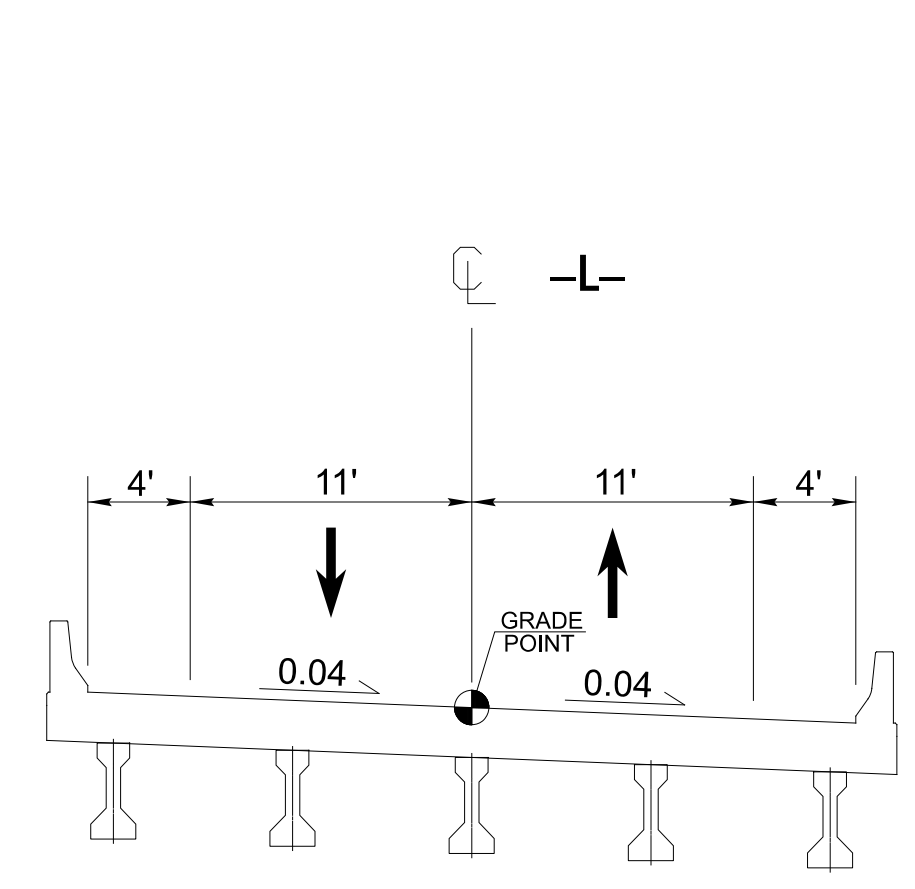
TYPICAL SECTION NO. 1
* 7' WITH GUARDRAIL

USE TYPICAL SECTION NO. 1 AS FOLLOWS:
-L- STA. 15+00.00 TO -L- STA. 16+20.00
-L- STA. 23+50.00 TO -L- STA. 25+00.00



TYPICAL SECTION NO. 2
* 7' WITH GUARDRAIL

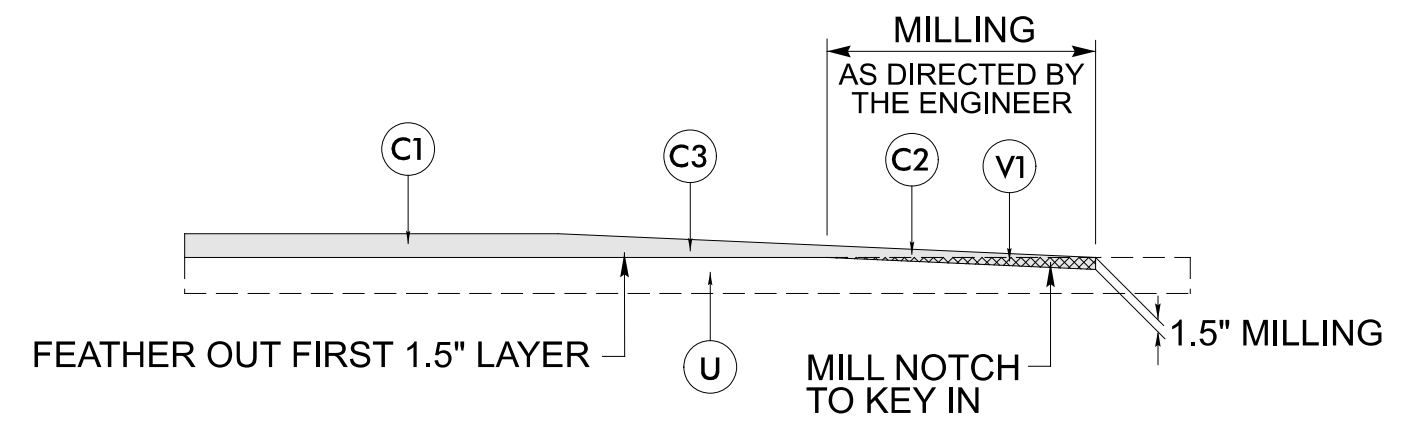
USE TYPICAL SECTION NO. 2 AS FOLLOWS:
-L- STA. 16+20.00 TO -L- STA. 18+52.05 (BEGIN BRIDGE)
-L- STA. 21+08.72 (END BRIDGE) TO -L- STA. 23+50.00



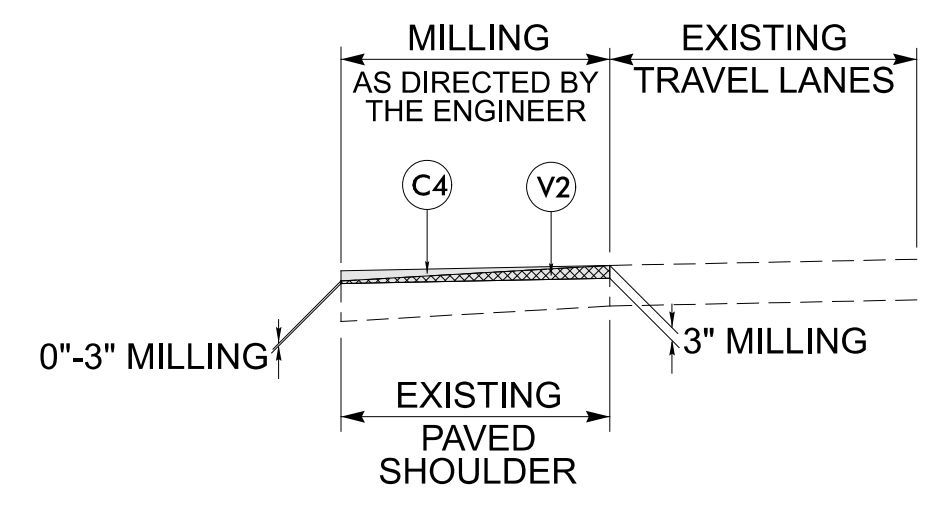
BRIDGE SKETCH NO. 1

USE BRIDGE TYPICAL SECTION AS FOLLOWS:
-L- STA. 18+52.05 (BEGIN BRIDGE) TO
-L- STA. 21+08.72 (END BRIDGE)

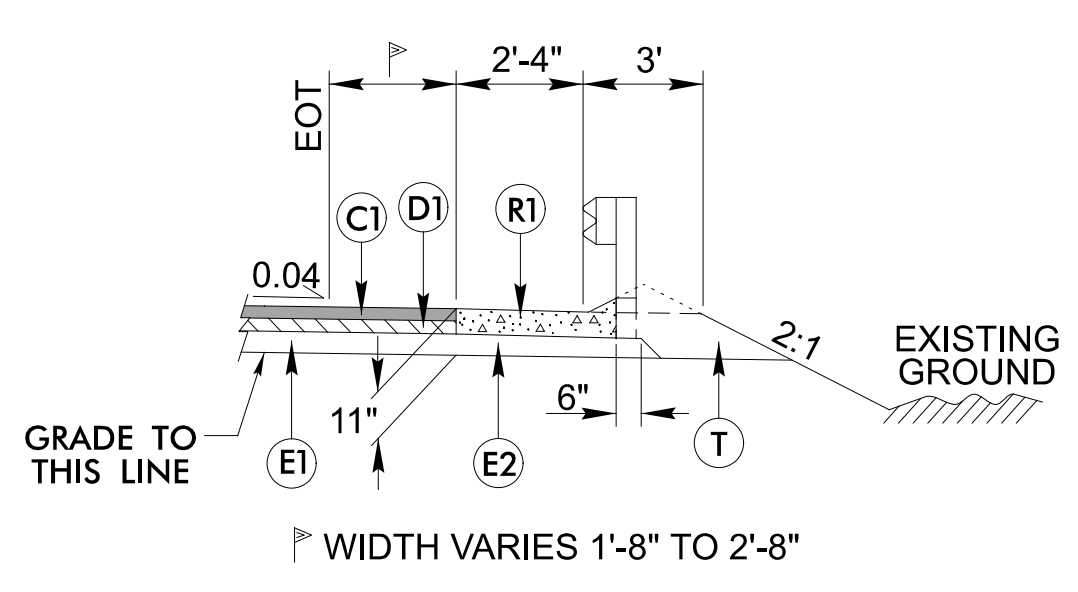
NOTE: SEE STRUCTURE PLANS FOR
STRUCTURE CONSTRUCTION DETAILS



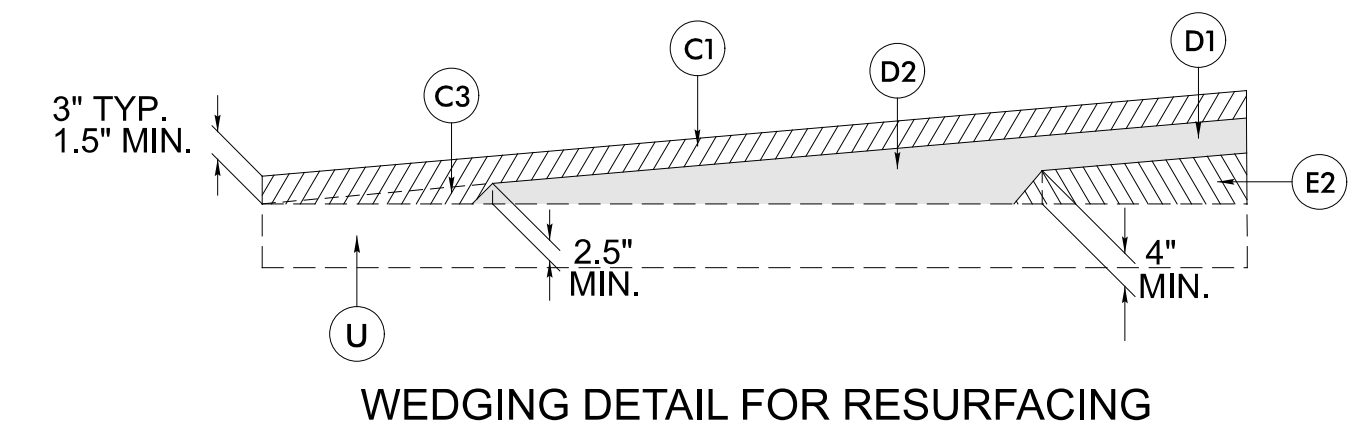
INCIDENTAL MILLING OF EXISTING PAVEMENT AS DIRECTED BY ENGINEER
-L- STA 15+00.00 TO -L- STA 15+50.00
-L- STA 24+50.00 TO -L- STA 25+00.00



MILLING OF EXISTING PAVEMENT AS DIRECTED BY ENGINEER
-Y- STA 15+19.85 TO -Y- STA 18+30.75 (RT)
-Y- STA 15+72.28 TO -Y- STA 18+89.17 (LT)



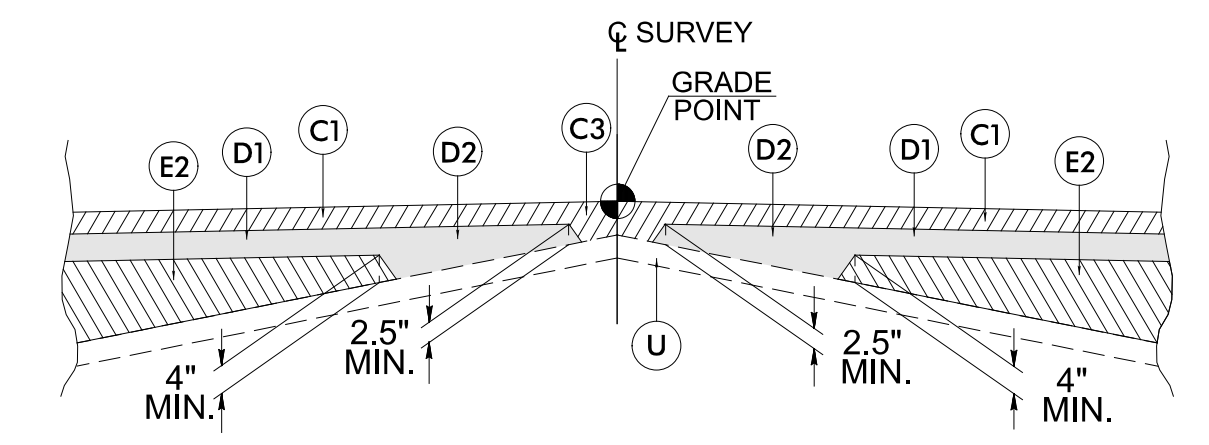
TYPICAL SECTION FOR SHOULDER BERM GUTTER
(NOTE: SCALE ENLARGED FOR DETAIL)
-L- STA 18+30.00 TO -L- STA 18+42.36 RT
-L- STA 21+28.92 TO -L- STA 22+75.10 RT



WEDGING DETAIL FOR RESURFACING

PAVEMENT SCHEDULE (FINAL)	
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 1.5" IN DEPTH.
C4	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
D1	PROP. APPROX. 4" 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, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 2.5" OR GREATER THAN 4" IN DEPTH.
D3	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.
D4	PROP. APPROX. 3.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 399 LBS. PER SQ. YD.
E1	PROP. APPROX. 4" 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, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 4" OR GREATER THAN 5.5" IN DEPTH.
E3	PROP. APPROX. 10" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
R1	PROP. CONCRETE SHOULDER BERM GUTTER
R2	PROP. PRECAST REINFORCED CONCRETE BARRIER, SINGLE FACE
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V1	INCIDENTAL MILLING BITUMINOUS PAVEMENT. SEE MILLING DETAIL (THIS SHEET).
V2	MILLING BITUMINOUS PAVEMENT (0" TO 3" DEPTH). SEE MILLING DETAIL (THIS SHEET) AND TYPICAL SECTION NO. 3 (SHEET 2A-2).
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAILS).
Y	RUMBLE STRIPS

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



DETAIL SHOWING METHOD OF WEDGING NO. 1

BR-0152
4RD1 2A-1
ROADWAY DESIGN ENGINEER

W. CRAIG PARKER, PE
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 25474

JOSE HOLLAND, PE
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 24964

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
STATE OF NORTH CAROLINA

ROADWAY DESIGN UNIT

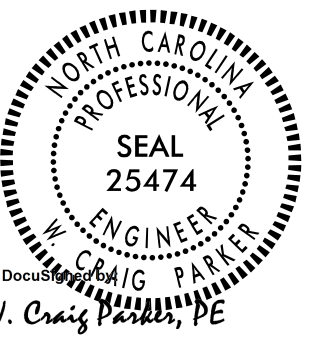
PREPARED BY WSP
434 FAYETTEVILLE ST. #1500
RALEIGH, N.C. 27601
NC ENG P-0165

FINAL PAVEMENT SCHEDULE

C1	PROP. 3" ACSC S9.5C	C4	PROP. 3" ACSC S9.5D	D3	PROP. 3" ACIC I19.0C	E2	PROP. VAR. ACBC B25.0C	R2	PROP. CONCRETE BARRIER	V1	INCIDENTAL MILLING	Y	RUMBLE STRIPS
C2	PROP. 1.5" ACSC S9.5C	D1	PROP. 4" ACIC I19.0C	D4	PROP. 3.5" ACIC I19.0C	E3	PROP. 10" ACBC B25.0C	T	EARTH MATERIAL	V2	MILLING 0"-3" (SEE SHT 2A-1)		
C3	PROP. VAR. ACSC S9.5C	D2	PROP. VAR. ACIC TYPE I19.0C	E1	PROP. 4" ACBC B25.0C	R1	PROP. SHOULDER BERM GUTTER	U	EXISTING PAVEMENT	W	WEDGING		

BR-0152

4RDI 2A-2
ROADWAY DESIGN ENGINEER



PAVEMENT DESIGN ENGINEER



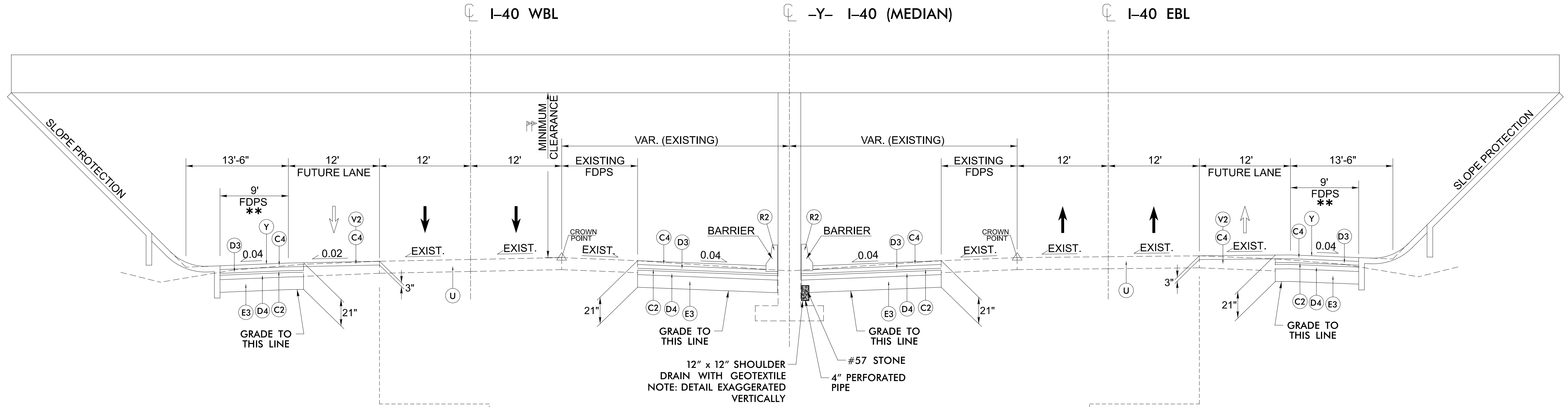
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
STATE OF NORTH CAROLINA



ROADWAY DESIGN UNIT

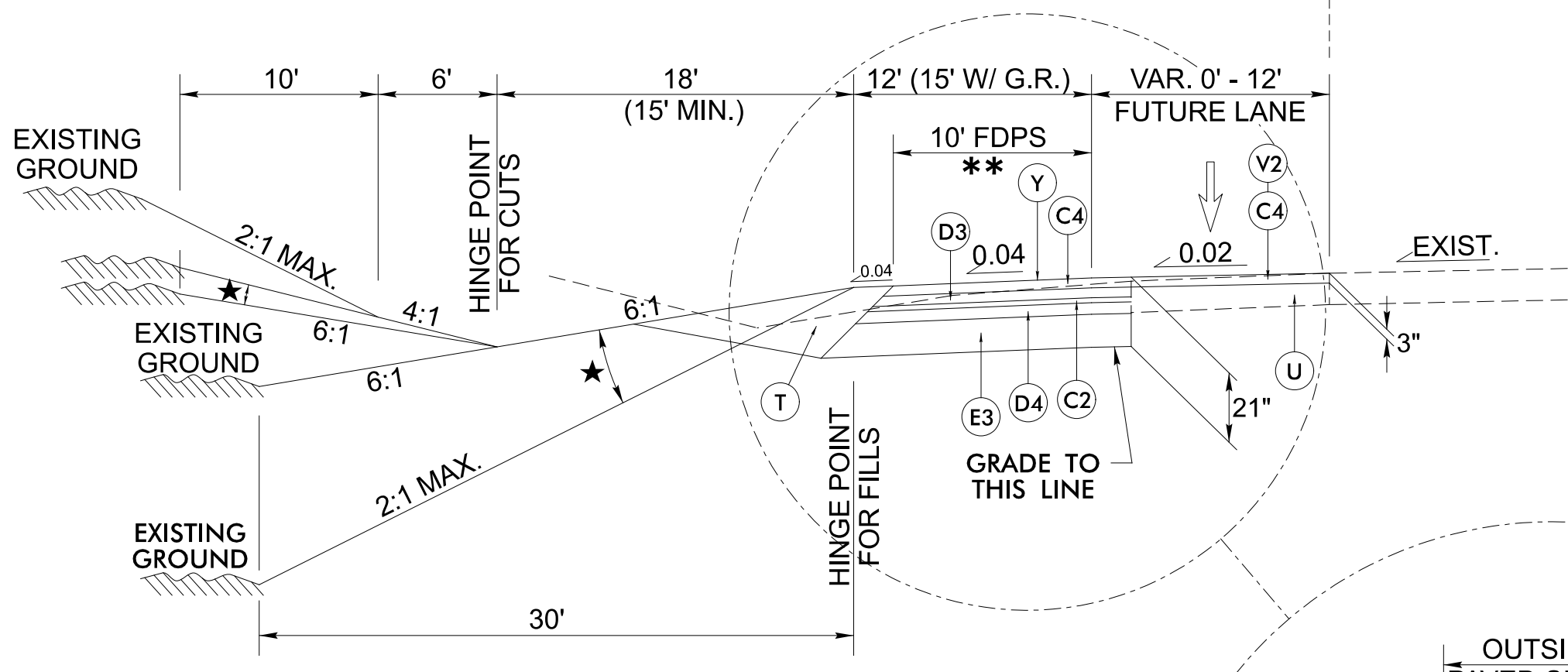
PREPARED BY
WSP

434 FAYETTEVILLE ST. #1500
RALEIGH, N.C. 27601
NC ENG P-0165



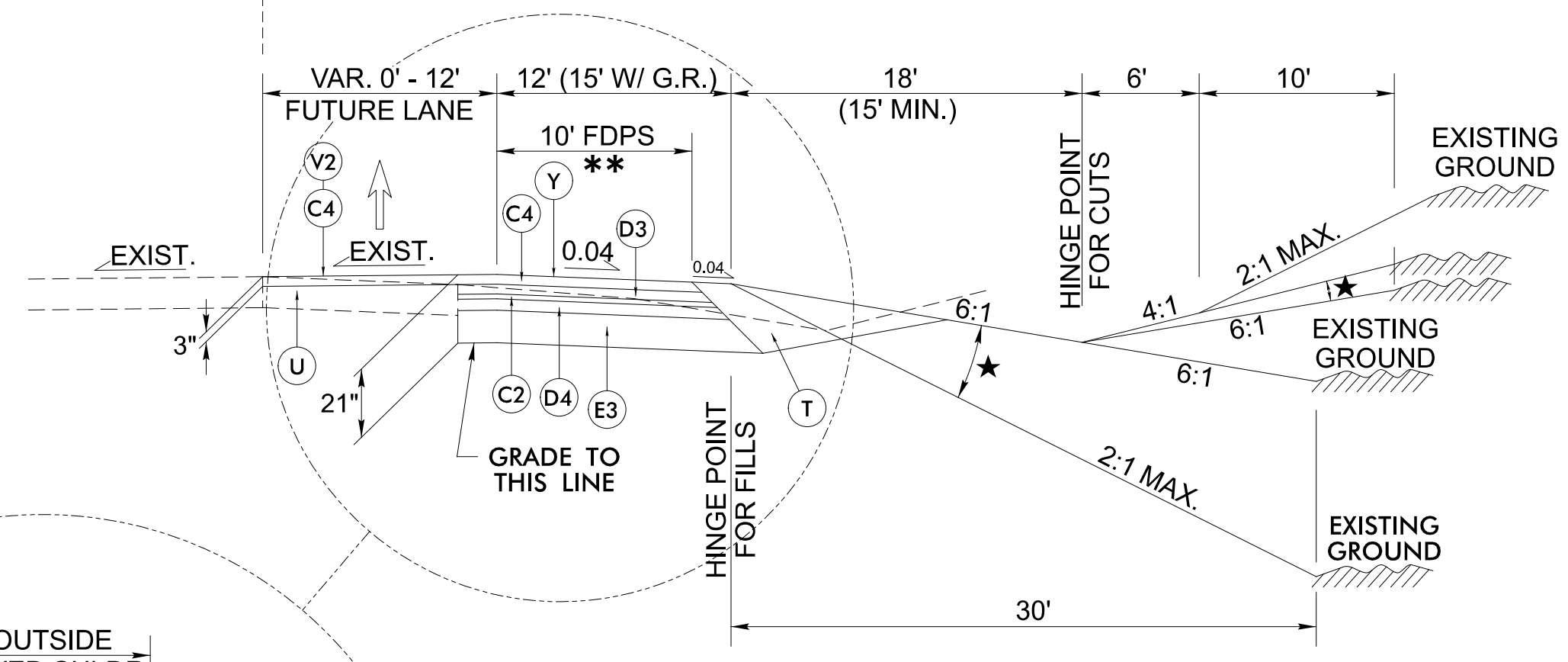
TYPICAL SECTION NO. 3
 ** MILLED RUMBLE STRIPS REQUIRED (STD. 665.01)
 MINIMUM CLEARANCE 16'-6"

USE TYPICAL SECTION NO. 3 AS FOLLOWS:
 -Y- STA. 16+29.91 RT TO 17+20.70 RT
 -Y- STA. 16+81.29 LT TO 17+73.94 LT
 NOTE: MEDIAN PAVEMENT APPLIES
 -Y- STA. 16+42.10 TO 17+40.88 (SEE PLANS)



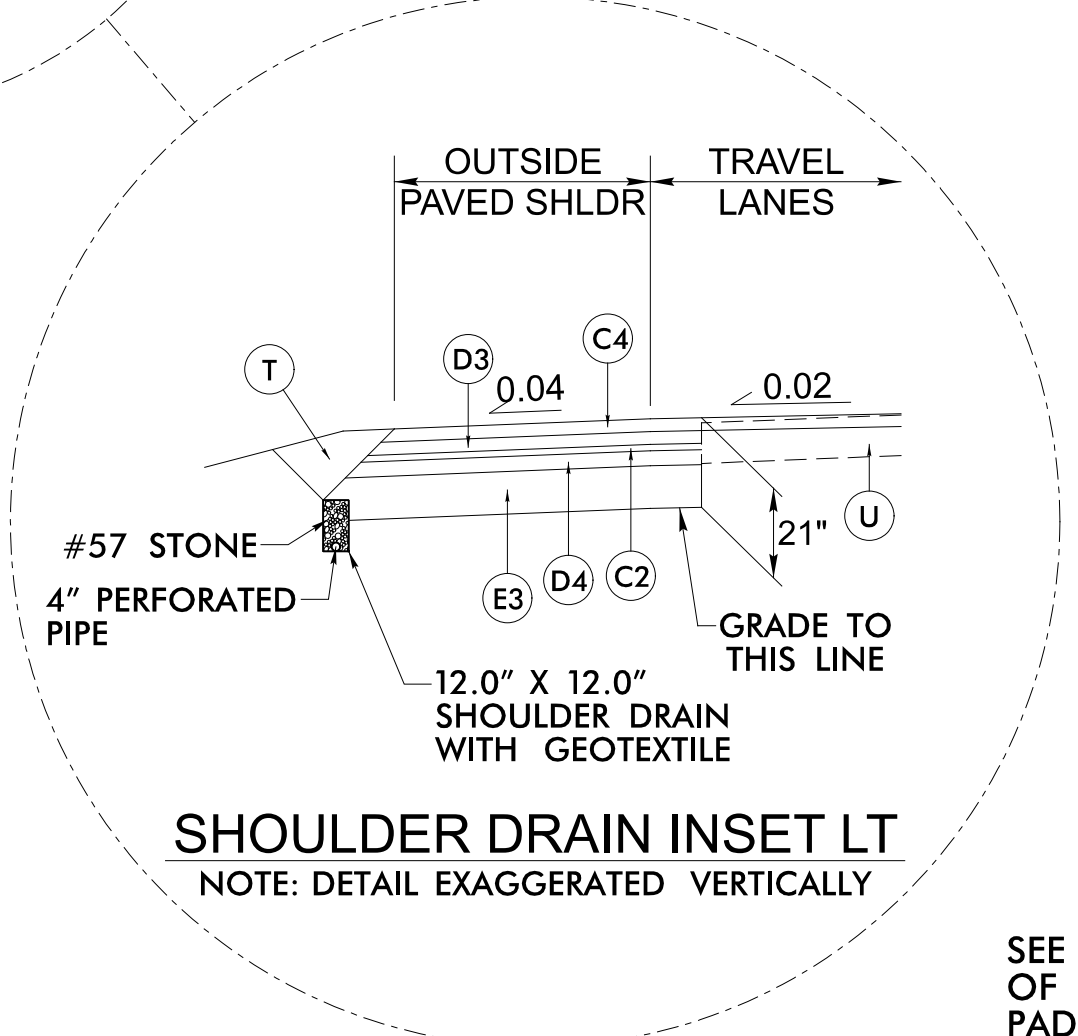
PART SECTION NO. 3A
 ** MILLED RUMBLE STRIPS REQUIRED (STD. 665.01)

USE PART SECTION NO. 3A AS FOLLOWS:
 -Y- STA. 15+72.28 LT TO 16+81.29 LT
 -Y- STA. 17+73.94 LT TO 18+89.17 LT

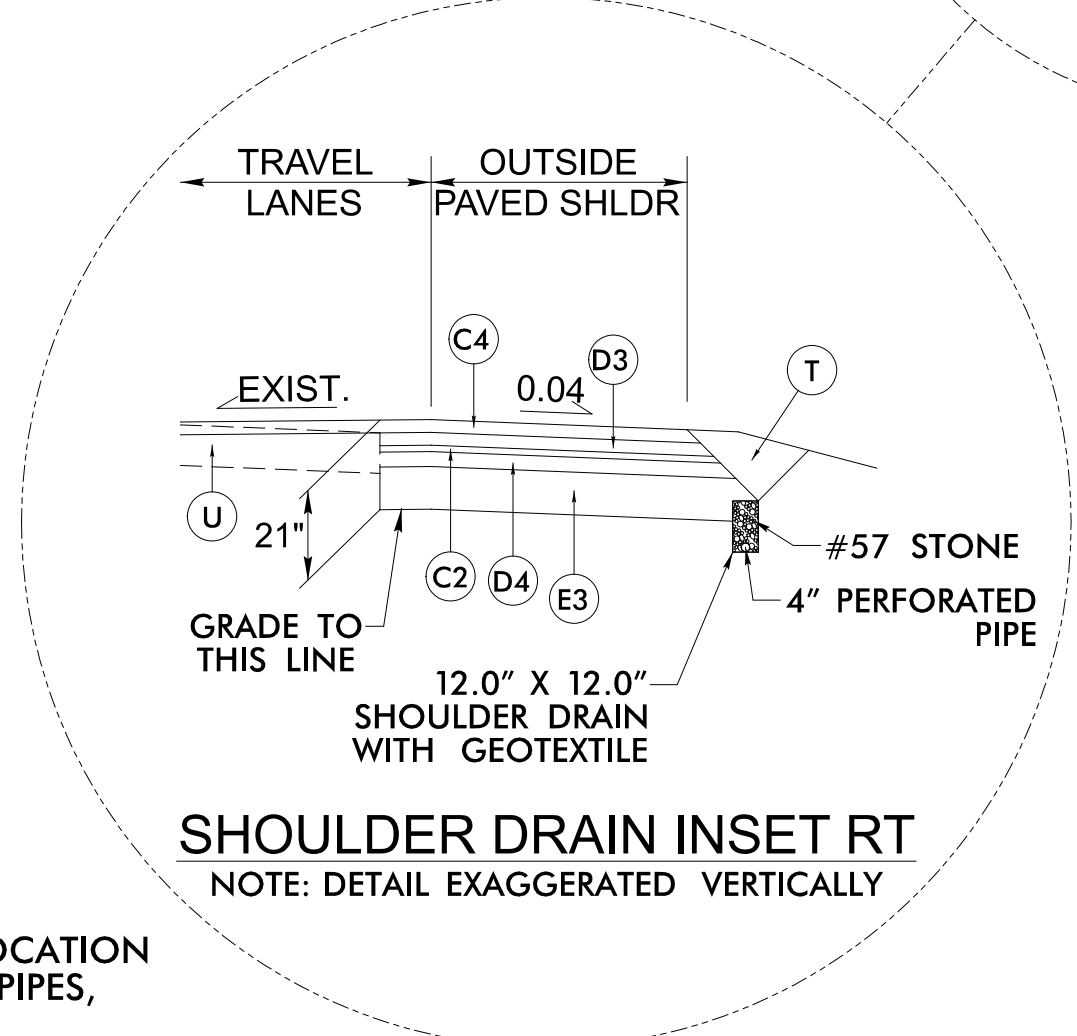


PART SECTION NO. 3B
 MILLED RUMBLE STRIPS ** REQUIRED (STD. 665.01)

USE PART SECTION NO. 3B AS FOLLOWS:
 -Y- STA. 15+19.85 RT TO 16+29.91 RT
 -Y- STA. 17+20.70 RT TO 18+30.75 RT

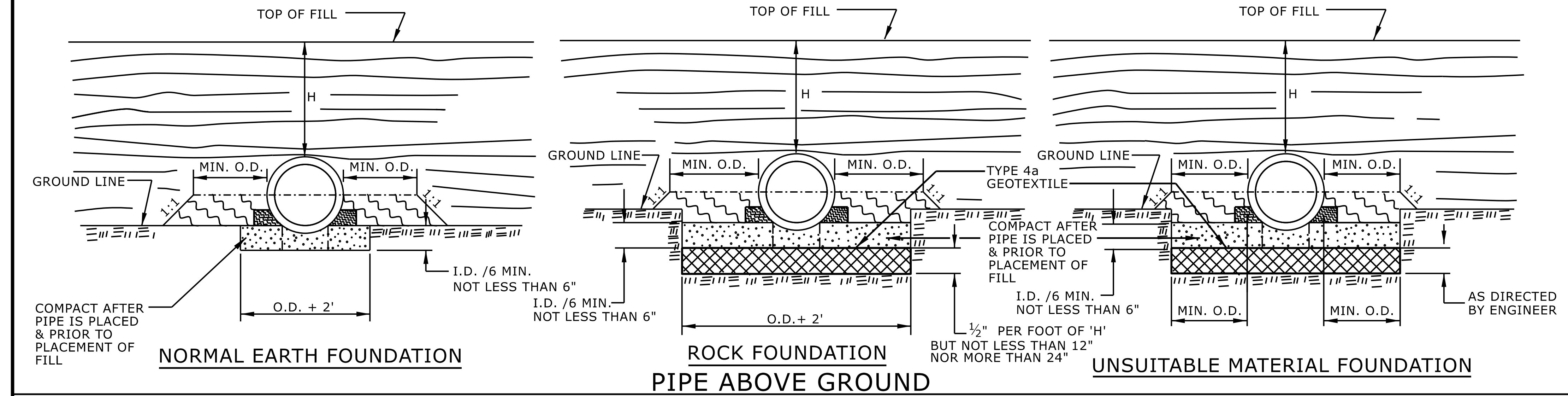
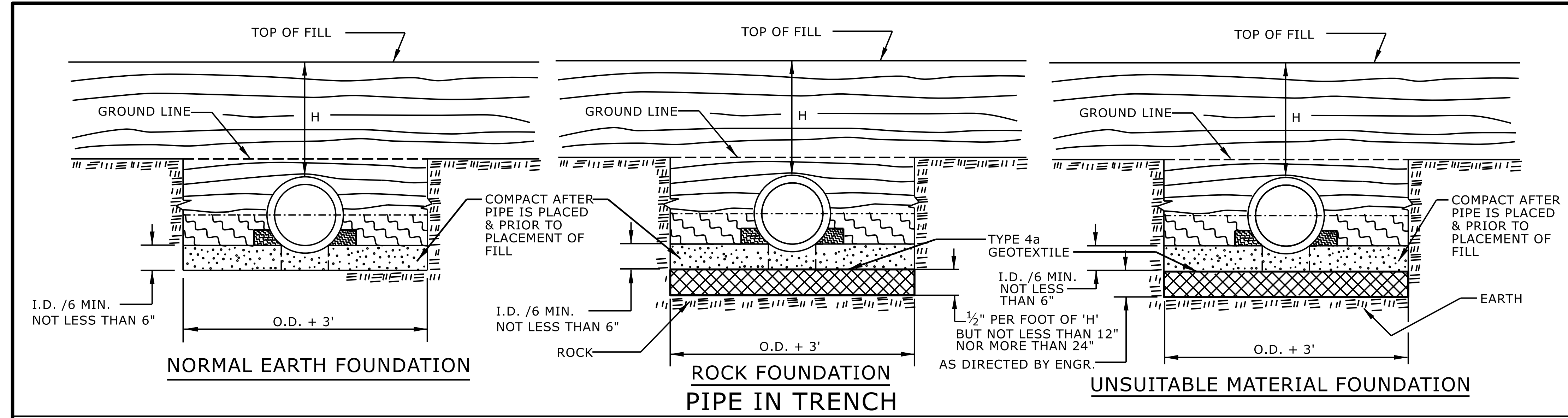


SHOULDER DRAIN INSET LT
 NOTE: DETAIL EXAGGERATED VERTICALLY



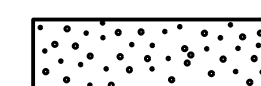


SHOULDER DRAIN INSET RT
 NOTE: DETAIL EXAGGERATED VERTICALLY

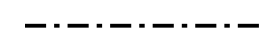

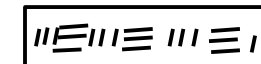

SEE SHEET 3B-1 FOR LOCATION OF SHOULDER DRAIN PIPES, PADS, AND OUTLETS.



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.

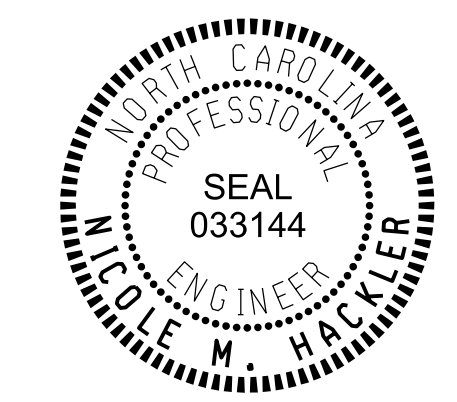
 APPROVED SUITABLE LOCAL MATERIAL.
 TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.
 LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.

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.

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

ROADWAY DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
 RIGID PIPE



Signed by:
 Nicole M. Hacker
 588432930416AC5

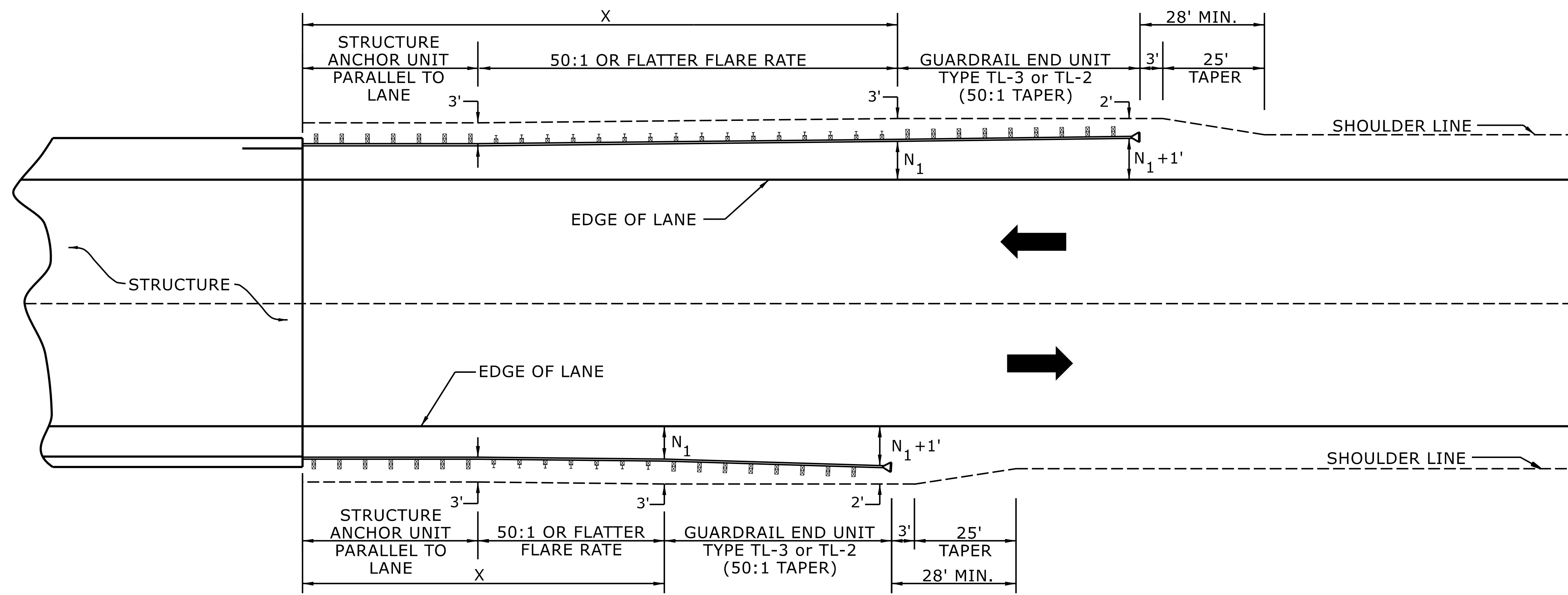
SHEET 2 OF 2
300.01

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

CONTRACTS STANDARDS AND DEVELOPMENT UNIT
 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.:

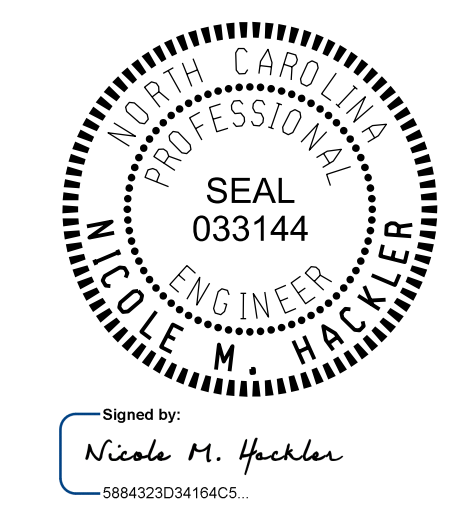


USE FLARE RATE AS THE CONTROL IF THE "N₁" DISTANCE IS NOT OBTAINED.
 ("N₁" IS BASED ON SHOULDER WIDTHS IN THE ROADWAY DESIGN MANUAL)
 SEE STD. 862.03 FOR STRUCTURE ANCHOR UNITS
 FOR POSTED SPEEDS ≥ 45MPH USE GREU TYPE TL-3
 FOR POSTED SPEEDS < 45MPH USE GREU TYPE TL-2
 GUARDRAIL LENGTH OF NEED (X) IS CALCULATED BASED ON THE AASHTO ROADSIDE DESIGN GUIDE.

LENGTHS AND OFFSETS FOR PROPOSED GUARDRAIL AT TWO LANE - TWO WAY LOCATIONS

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT



Signed by:
 Nicole M. Hackler
 588432034164CS

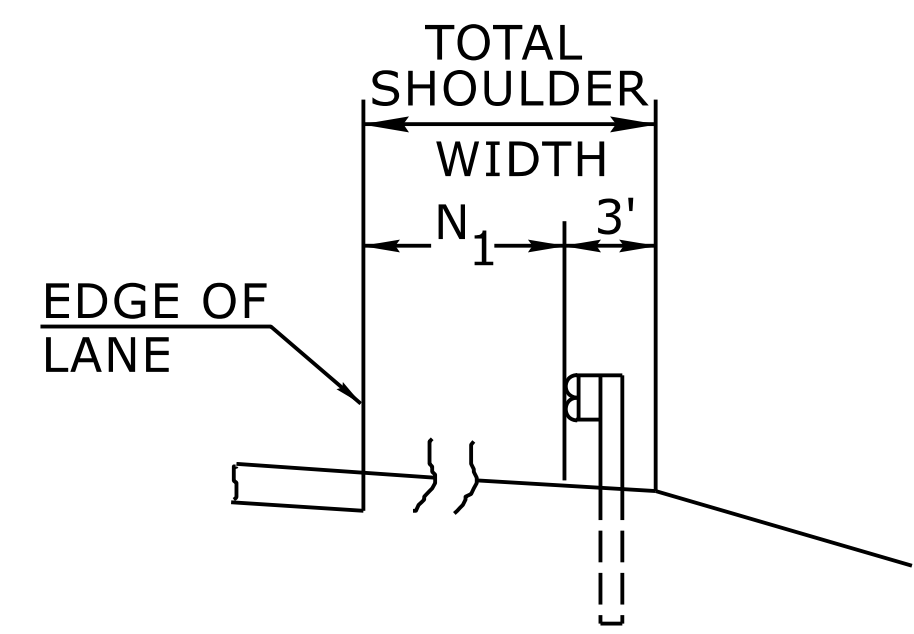
SHEET 4 OF 15
862D01

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

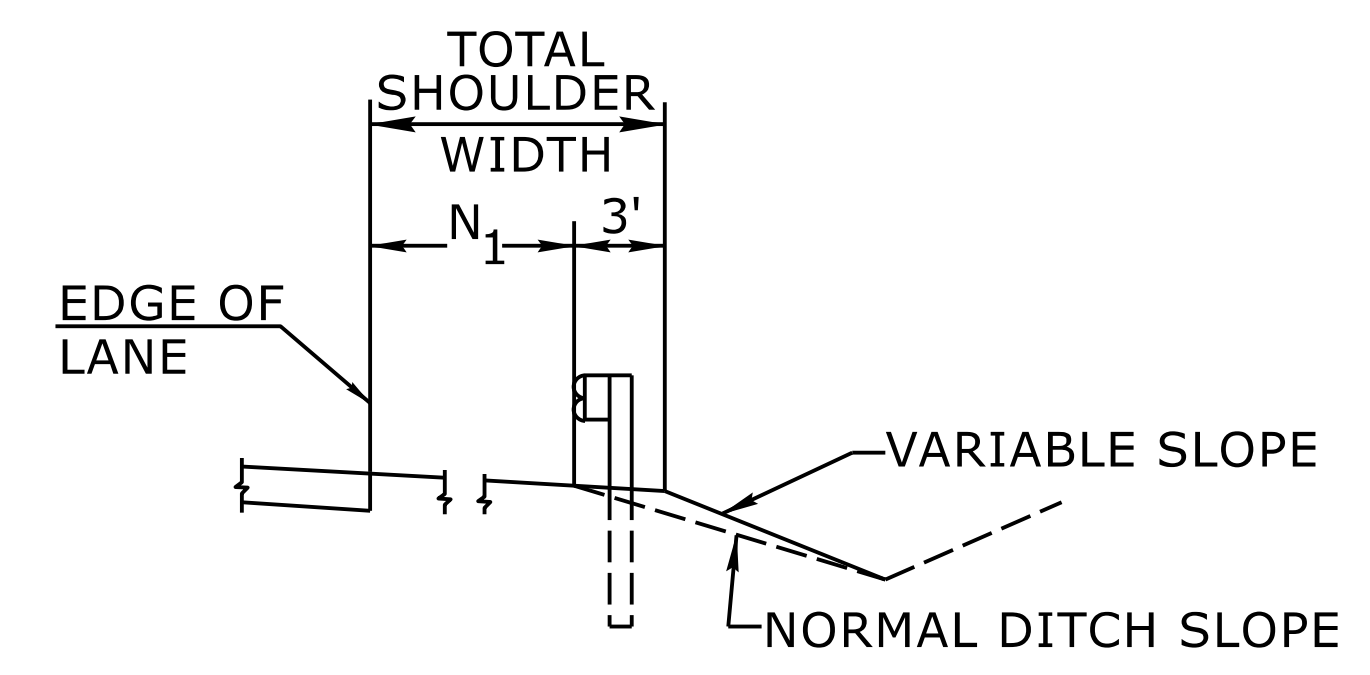
**CONTRACTS STANDARDS
 AND DEVELOPMENT UNIT**
 Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

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

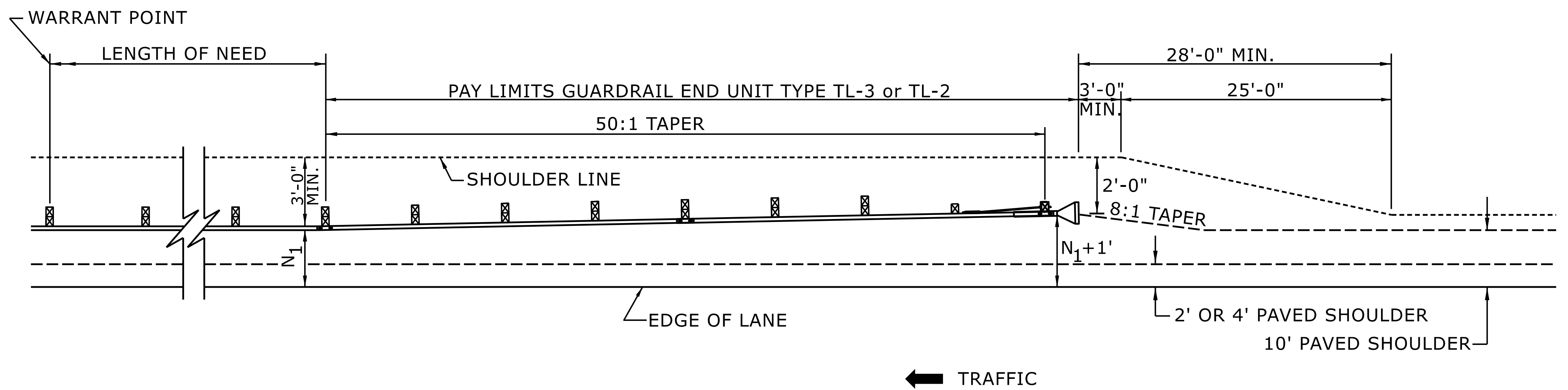


FILL SECTION



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



Signed by:
Nicole M. Hackler
58843203416425

SHEET 6 OF 15
862D01

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

**CONTRACTS STANDARDS
AND DEVELOPMENT UNIT**
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.:	

5/26/2024

WOVEN WIRE FENCE SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	48" FABRIC (LF)	4" POSTS (EA)	5" POSTS (EA)
-L-	17+80.61	18+40.00	LT	73.9	1	8
-L-	18+37.58	18+54.00	RT	34.8	0	5
-L-	21+02.00	21+34.11	LT	42.2	0	5
-L-	21+21.00	22+21.04	RT	109.2	3	8
TOTALS:				260.1	4	26
SAY:				290	5	29

SUMMARY OF 4" SHOULDER DRAINS

SURVEY LINE	BEG STATION	END STATION	LOCATION LT/RT/MED	SHOULDER DRAIN PIPE (LF)	SHOULDER DRAINS (LF)	OUTLET STATION	OUTLET PIPES (FT)	CONCRETE PADS (EA)
-Y-	15+72.28	18+89.00	LT OUTSIDE (WB)	316.72	316.72	15+72.28	12	1
						16+75.00	5	N/A (2GI 0405)
						17+80.00	5	N/A (2GI 0406)
						18+85.00	16	N/A (2GI 0407)
-Y-	15+19.85	18+30.75	RT OUTSIDE (EB)	310.90	310.90	15+19.85	12	1
						16+20.00	5	N/A (2GI 0402)
						17+10.00	4	N/A (2GI 0410)
						18+00.00	18	N/A (2GI 0411)
-Y-	16+65.00	17+40.88	RT MEDIAN (EB)	75.88	75.88	17+70.00	9	N/A (2GI 0412)
						16+65.00	14	N/A (2GI 0404)
TOTALS:				703.50	703.50		100	2
SAY:				710	710		110	2

NOTE: SEE SHEET 2A-2 FOR SHOULDER DRAIN DETAILS.

SUMMARY OF EARTHWORK

LINE	STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
		(BEG. BRIDGE)				
-L-	15+00.00	18+52.05	89	894	805	
SUBTOTAL:			89	894	805	
		(END BRIDGE)				
-L-	21+08.72	25+00.00	291	1,087	796	
SUBTOTAL:			291	1,087	796	
-Y- (LEFT)	15+72.28	18+89.17	2,001	16		1,985
SUBTOTAL:			2,001	16		1,985
-Y- (RIGHT)	15+19.85	18+30.75	1,437	59		1,378
SUBTOTAL:			1,437	59		1,378
PROJECT TOTALS:			3,818	2,056	1,601	3,363
EARTH WASTE TO REPLACE BORROW					-1,601	-1,601
GRAND TOTALS:			3,818	2,056	0	1,762
SAY:			4,200			

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
STATE OF NORTH CAROLINA



ROADWAY DESIGN UNIT
PREPARED BY
wsp
434 FAYETTEVILLE ST. #1500
RALEIGH, N.C. 27601
NC ENG P-0165

ASPHALT PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION	YD ³
-L-	16+20.00	17+00.00	CL	168.56
-L-	23+00.00	23+50.00	CL	106.28
TOTAL:				274.84
SAY:				300

SUMMARY OF BREAKING EXISTING ASPHALT PAVEMENT

SURVEY LINE	STATION	STATION	LOCATION	YD ²
-L-	17+00.00	18+44.54	CL	306.08
-L-	21+14.08	23+00.00	CL	395.49
TOTAL:				701.57
SAY:				770

CABLE GUIDERAIL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION	LENGTH	ANCHORS
-L-	18+49.60	18+74.60	MED RT	25.00	1
TOTAL:				25	1

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LOCATION	LENGTH
-L-	18+30.00	18+42.36	RT	12.36
-L-	21+28.92	22+75.10	RT	146.18
TOTAL:				158.54
SAY:				174

PAVEMENT STRUCTURE VOLUME = 1,747 CY
ESTIMATED SHOULDER BORROW = 578 CY
PER GEOTECHNICAL RECOMMENDATIONS DATED FEBRUARY 21, 2024:
ESTIMATED SHALLOW UNDERCUT = 200 CY
CLASS IV SUBGRADE STABILIZATION = 400 TONS
ESTIMATED UNDERCUT = 450 CUBIC YARDS

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

Note: Approximate quantities only. Clearing and Grubbing, Unclassified Excavation, Shoulder Borrow, Fine Grading, Removal of Existing Asphalt Pavement, and Breaking of Existing Asphalt Pavement will be paid for at the contract lump sum price for "Grading."

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W				ANCHORS			IMPACT ATTENUATOR TYPE TL-3			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS	
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GREU TL-3	TYPE III	B-77	CAT-1	AT-1	EA	G	NG					
-L-	17+87+/-	18+47.58	LT	47.875'	31.25'			18+47.58	4'	7'							1								118'	SHOP CURVED RADIUS = 12.7'	
-L-	18+02+/-	18+56.57	RT	47.875'	31.25'		18+56.57		4'	7'															118'	SHOP CURVED RADIUS = 12.0'	
-L-	21+02.78	22+29+/-	LT	110.375'	31.25'		21+02.78		4'	7'															122'	SHOP CURVED RADIUS = 17.0'	
-L-	21+14.73	22+75.105	RT	160.375'				21+14.73	4'	7'	50'					1									168'		
-Y-	16+25.87	16+65.00	MED LT	47.875'				16+78.00	17.7'	20'	16.2'									1		X					
-Y-	16+25.87	16+65.00	MED RT	47.875'			16+78.00		17.7'	20'	16.2'																
-Y-	17+18.00	17+57.12	MED LT	47.875'			17+18.00		17.7'	20'	16.2'									1		X					
-Y-	17+18.00	17+57.12	MED RT	47.875'			17+18.00		17.7'	20'	16.2'	16.2'															
-Y-	13+65.63	17+42.25	RT																						377'		
-Y-	16+62.44	19+93.66	LT																						330'		
SUBTOTALS				558.00'	93.75'												1		8			3	2			1,233'	
ANCHOR DEDUCTIONS:																											
				1 GREU TL-3 @ 50' =	50.00'																						
				8 B-77 @ 22.875' =	183.00'																						
				3 AT-1 @ 6.25' =	18.75'																						
TOTALS:				325.00'	75.00'												1		8			3	2			1,233'	
SAY:				350.00'	100.00'											1		8			3	2			1,233'		

11/22/2024 USWP718089

COMPUTED BY: Eddie Beverly DATE: 2/20/24
 CHECKED BY: Shping Yang DATE: 2/20/24

(2-3-23)

PROJECT NO.
BR-0152

SHEET NO.
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

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

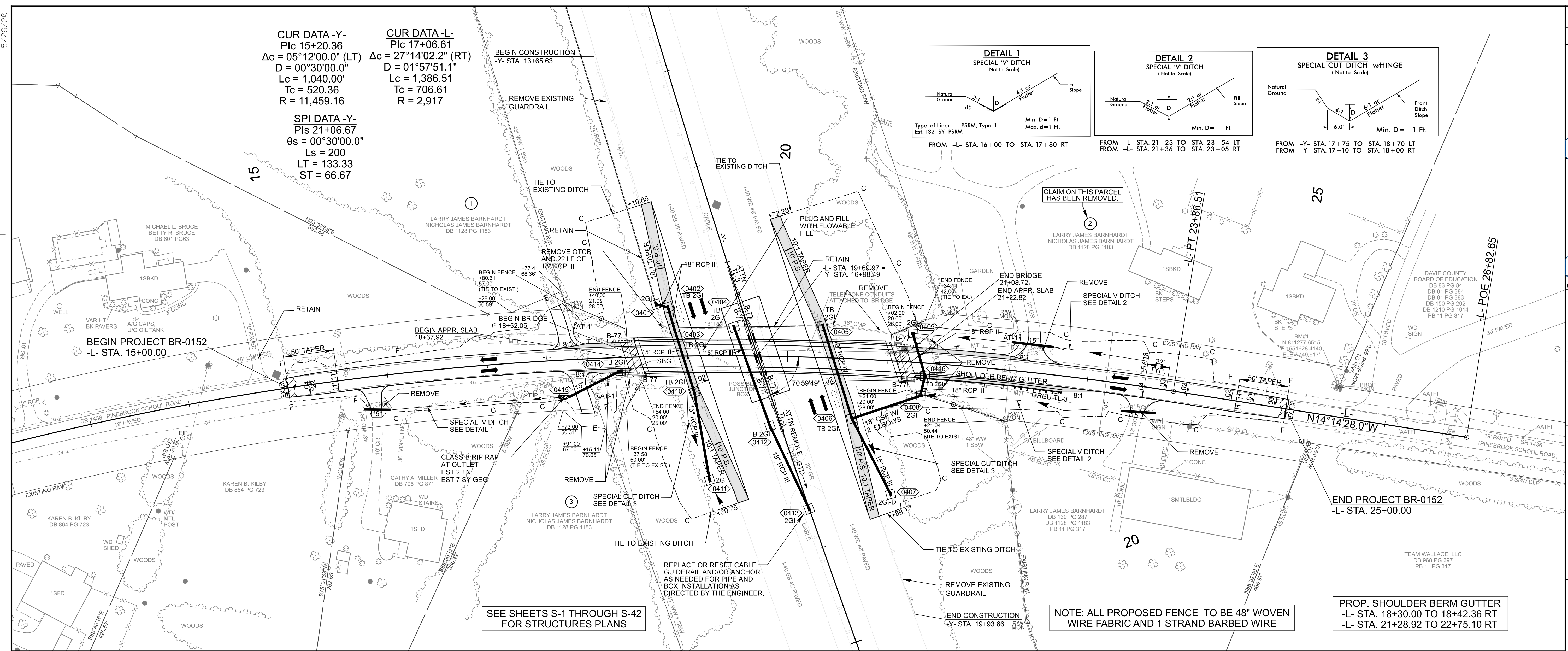
LINE	Station	Station	Aggregate Type* ASU(1/2)/ AST	Aggregate Thickness INCHES [8" for ASU(2)]	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Subgrade Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			ASU(1)	12	200	400	400		
TOTAL CY/TONS/SY:					200	400**	400**	0	0

*ASU(1/2) = Aggregate Subgrade (Type 1 or 2)
 *AST = Aggregate Stabilization
 **Total tons of "Class IV Subgrade Stabilization" and total square yards of "Geotextile for Subgrade Stabilization" are only the estimated quantities for ASU(1/2)/AST and may only represent a portion of the subgrade stabilization and geotextile quantities shown in the Item Sheets of the Proposal.

CUR DATA -Y-
 Plc 15+20.36
 $\Delta c = 05^{\circ}12'00.0''$ (LT)
 $D = 00^{\circ}30'00.0''$
 $Lc = 1,040.00'$
 $Tc = 520.36$
 $R = 11,459.16$

CUR DATA -L-
 Plc 17+06.61
 $\Delta c = 27^{\circ}14'02.2''$ (RT)
 $D = 01^{\circ}57'51.1''$
 $Lc = 1,386.51$
 $Tc = 706.61$
 $R = 2,917$

SPI DATA -Y-
 Pls 21+06.67
 $\theta s = 00^{\circ}30'00.0''$
 $Ls = 200$
 $LT = 133.33$
 $ST = 66.67$



BR-0152
 4RDI 4
 ROADWAY DESIGN ENGINEER

SEAL 25474
 NORTH CAROLINA PROFESSIONAL ENGINEER
 W. Craig [Signature]

SEAL 052432
 NORTH CAROLINA PROFESSIONAL ENGINEER
 James O. Britt

HYDRAULIC DESIGN ENGINEER

ROADWAY DESIGN UNIT
PREPARED BY
WSP
 434 FAYETTEVILLE ST., #1500
 RALEIGH, N.C. 27601
 NC ENG P-0165

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
 STATE OF NORTH CAROLINA

TEAM WALLACE, LLC
 DB 968 PG 397
 PB 11 PG 317

