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09/08/19

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

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**COLUMBUS COUNTY**

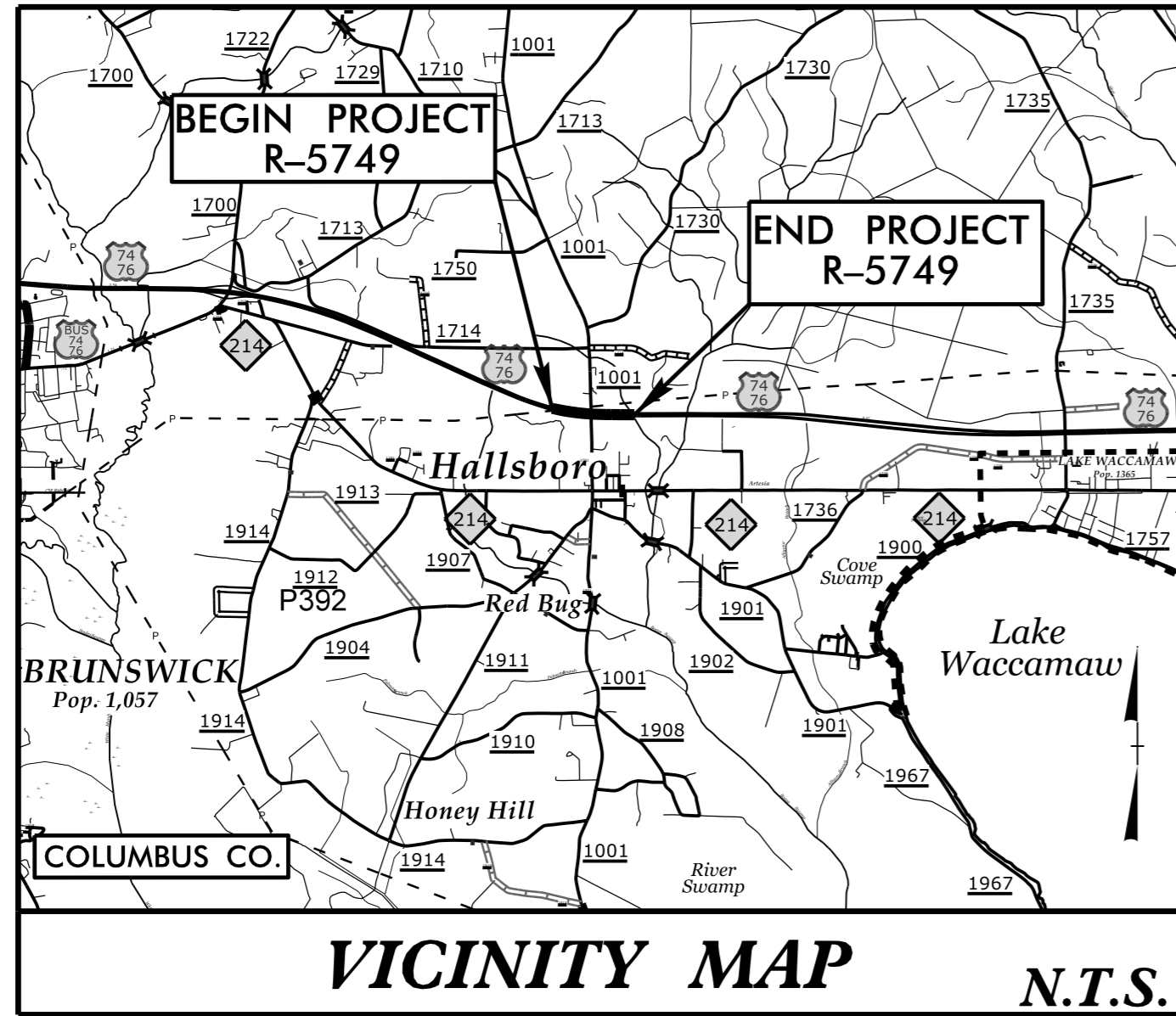
LOCATION: US 7476 AT SR 1001 (HALLSBORO ROAD)  
CONVERT AT GRADE INTERSECTION TO INTERCHANGE

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

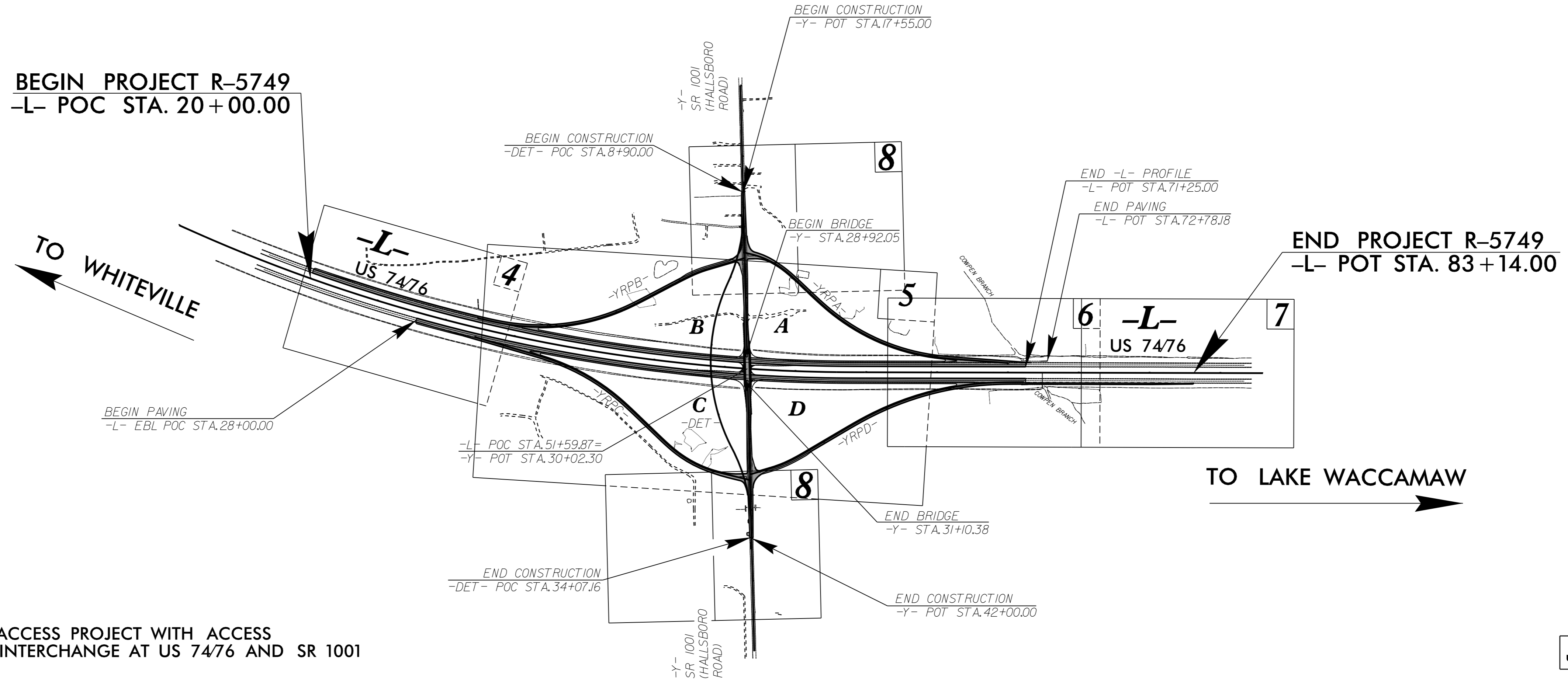
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5749	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
53086.1.FD1	HSIP-0074 (169)	P.E.	
53086.2.1	NHP-0074 (169)	R/W	
53086.2.2	NHP-0074 (169)	UTIL.	
53086.3.1	NHP-0074 (169)	CONST.	

TIP PROJECT: R-5749

CONTRACT: C204115

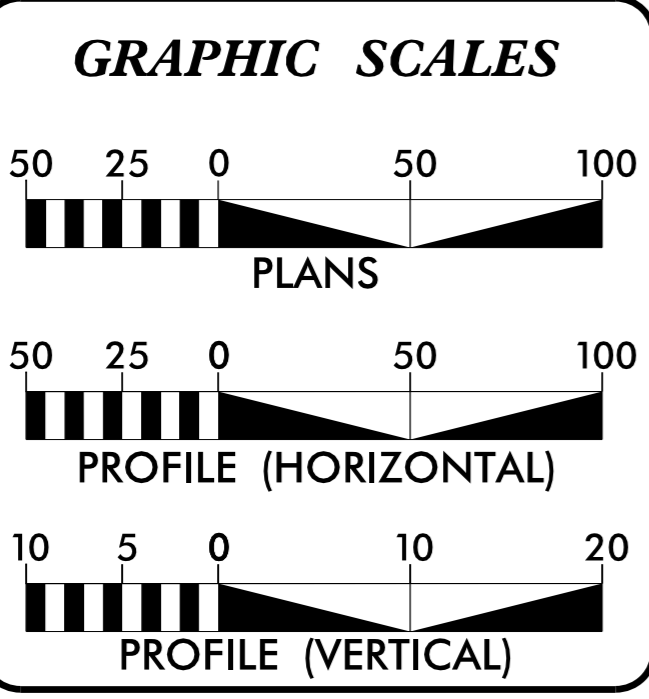


BEGIN PROJECT R-5749  
-L- POC STA. 20+00.00



THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO THE INTERCHANGE AT US 7476 AND SR 1001 (HALLSBORO ROAD).

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



**DESIGN DATA**

ADT 2018 =	12,900
ADT 2038 =	18,700
DHV =	55 %
D =	8 %
T =	16 % *
V =	75 MPH
* TTST =	3 DUAL = 13
FUNC CLASS =	INTERSTATE
STATEWIDE TIER	

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT R-5749	=	1.196	MILES
TOTAL LENGTH TIP PROJECT R-5749	=	1.196	MILES

Prepared in the Office of:  
**CDM Smith**  
4500 Glenwood Avenue  
Suite 400  
Raleigh, NC 27612-3228  
NC CDA No. F-1255

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:  
MARCH 2017

LETTING DATE:  
FEBRUARY 20, 2018

DAVID J. CLODGO, P.E.  
PROJECT ENGINEER

KIT A. PERSIANI, P.E.  
PROJECT DESIGN ENGINEER

SEAN MATUSZEWSKI  
NCDOT CONTACT

**HYDRAULICS ENGINEER**

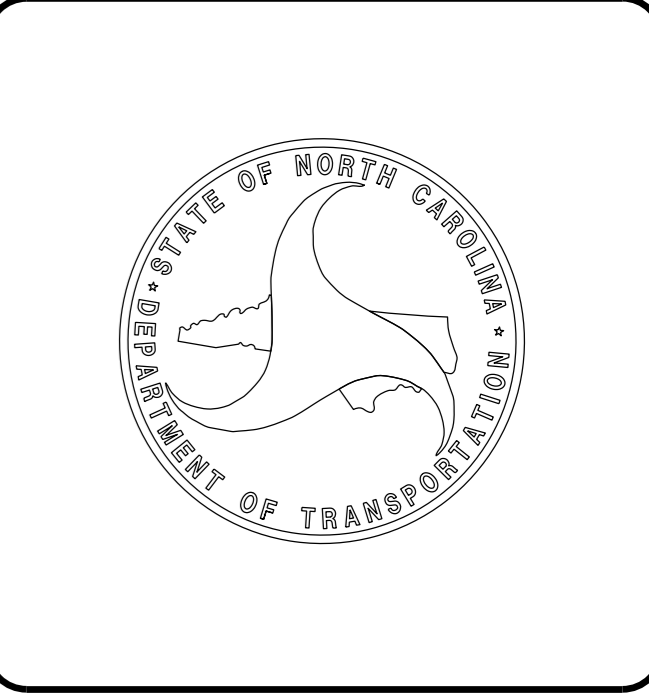
12/8/2017  
SEAL 18533  
A. T. NOTTINGHAM  
ENGINEER  
P.E.

Signature: A. T. Nottingham

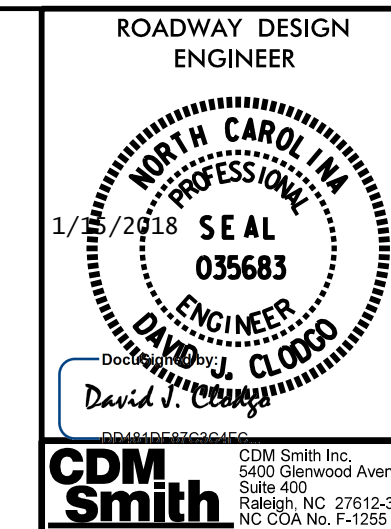
**ROADWAY DESIGN ENGINEER**

12/8/2017  
SEAL 035683  
DAVID J. CLODGO  
ENGINEER  
P.E.

Signature: David J. Clodgo



-SYSTEME:\d2314105\195749\_rdy\_t sh.dgn  
USER: CONRADAM



INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
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2B-1 THRU 2B-4	ROADWAY DETAILS
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S-1 THRU S-26	BRIDGE PLANS
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GENERAL NOTES: 2018 SPECIFICATIONS  
EFFECTIVE: 01-16-2018  
REVISED:

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. 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. 560.02

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.

UNDERDRAINS:

UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.03 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 BRUNSWICK EMC, CENTURYLINK, CHARTER COMMUNICATIONS AND DUKE ENERGY PROGRESS. ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

2018 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2018 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
<b>DIVISION 2 - EARTHWORK</b>	
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
225.03	Deceleration and Acceleration Lanes
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
<b>DIVISION 3 - PIPE CULVERTS</b>	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
<b>DIVISION 4 - MAJOR STRUCTURES</b>	
422.03	Reinforced Bridge Approach Fills - Type A Alternate Approach Fill for Integral Abutment
<b>DIVISION 5 - SUBGRADE, BASES AND SHOULDERS</b>	
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
<b>DIVISION 6 - ASPHALT BASES AND PAVEMENTS</b>	
610.03	Guide for Paving Shoulders Under Bridges - Method III
654.01	Pavement Repairs
665.01	Asphalt Shoulders - Milled Rumble Strips
<b>DIVISION 8 - INCIDENTALS</b>	
815.02	Subsurface Drain
815.03	Pipe Underdrain and Blind Drain
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.21	Reinforced Concrete Endwall - for Single 54" Pipe 90 Skew
838.22	Reinforced Concrete Endwall - for Double and Triple 54" Pipes 90 Skew
838.27	Reinforced Concrete Endwall - for Single 60" Pipe 90 Skew
838.39	Reinforced Concrete Endwall - for Single 72" Pipe 90 Skew
838.45	Notes for Reinforced Concrete Endwall - Std. Dwg 838.21 thru 838.40
838.51	Reinforced Brick Endwall - for Single 54" Pipe 90 Skew
838.52	Reinforced Brick Endwall - for Double and Triple 54" Pipes 90 Skew
838.57	Reinforced Brick Endwall - for Single 60" Pipe 90 Skew
838.69	Reinforced Brick Endwall - for Single 72" Pipe 90 Skew
838.75	Notes for Reinforced Brick Endwall - Std. Dwg 838.51 thru 838.70
838.80	Precast Endwalls - 12" thru 72" Pipe 90 Skew
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
840.22	Frames and Wide Slot Sag Grates
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
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
852.01	Concrete Islands
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
866.02	Woven Wire Fence - with Wood Post
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets

# STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

## CONVENTIONAL PLAN SHEET SYMBOLS

*Note: Not to Scale \*S.U.E. = Subsurface Utility Engineering*

04/05/15

### BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EIP
Property Corner	----->
Property Monument	□ EDM
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	☠
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	○ 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	-----
False Sump	-----

### RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○ MILEPOST 35
Switch	□ SWITCH
RR Abandoned	-----
RR Dismantled	-----

### RIGHT OF WAY:

Baseline Control Point	◆
Existing Right of Way Marker	△
Existing Right of Way Line	-----
Proposed Right of Way Line	----- RW
Proposed Right of Way Line with Iron Pin and Cap Marker	----- RW
Proposed Right of Way Line with Concrete or Granite R/W Marker	----- RW
Proposed Control of Access Line with Concrete CA Marker	----- CA

Existing Control of Access	----- CA
Proposed Control of Access	----- CA
Existing Easement Line	----- E
Proposed Temporary Construction Easement	----- E
Proposed Temporary Drainage Easement	----- TDE
Proposed Permanent Drainage Easement	----- PDE
Proposed Permanent Drainage / Utility Easement	----- DUE
Proposed Permanent Utility Easement	----- PUE
Proposed Temporary Utility Easement	----- TUE
Proposed Aerial Utility Easement	----- AUE

Proposed Permanent Easement with Iron Pin and Cap Marker	◆
--	---

### 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	-----
Proposed Guardrail	-----
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	○ S
Storm Sewer	----- S

### UTILITIES:

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 LOS B (S.U.E.*)	----- P
U/G Power Line LOS C (S.U.E.*)	----- P
U/G Power Line LOS D (S.U.E.*)	----- P

### TELEPHONE:

Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	⊕
Telephone Pedestal	⊠
Telephone Cell Tower	⊠
U/G Telephone Cable Hand Hole	○
U/G Telephone Cable LOS B (S.U.E.*)	----- T
U/G Telephone Cable LOS C (S.U.E.*)	----- T
U/G Telephone Cable LOS D (S.U.E.*)	----- T
U/G Telephone Conduit LOS B (S.U.E.*)	----- TC
U/G Telephone Conduit LOS C (S.U.E.*)	----- TC
U/G Telephone Conduit LOS D (S.U.E.*)	----- TC
U/G Fiber Optics Cable LOS B (S.U.E.*)	----- T FO
U/G Fiber Optics Cable LOS C (S.U.E.*)	----- T FO
U/G Fiber Optics Cable LOS D (S.U.E.*)	----- T FO

### WATER:

Water Manhole	⊕
Water Meter	○
Water Valve	⊗
Water Hydrant	⊕
U/G Water Line LOS B (S.U.E.*)	----- W
U/G Water Line LOS C (S.U.E.*)	----- W
U/G Water Line LOS D (S.U.E.*)	----- W
Above Ground Water Line	----- A/G Water

### TV:

TV Pedestal	⊠
TV Tower	⊗
U/G TV Cable Hand Hole	○
U/G TV Cable LOS B (S.U.E.*)	----- TV
U/G TV Cable LOS C (S.U.E.*)	----- TV
U/G TV Cable LOS D (S.U.E.*)	----- TV
U/G Fiber Optic Cable LOS B (S.U.E.*)	----- TV FO
U/G Fiber Optic Cable LOS C (S.U.E.*)	----- TV FO
U/G Fiber Optic Cable LOS D (S.U.E.*)	----- TV FO

### GAS:

Gas Valve	◇
Gas Meter	⊕
U/G Gas Line LOS B (S.U.E.*)	----- G
U/G Gas Line LOS C (S.U.E.*)	----- G
U/G Gas Line LOS D (S.U.E.*)	----- 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 Forced Main Line LOS B (S.U.E.*)	----- FSS
SS Forced Main Line LOS C (S.U.E.*)	----- FSS
SS Forced Main Line LOS D (S.U.E.*)	----- FSS

### MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊠
Utility Unknown U/G Line LOS B (S.U.E.*)	----- ?UTL
U/G Tank; Water, Gas, Oil	□
Underground Storage Tank, Approx. Loc.	⊠ UST
A/G Tank; Water, Gas, Oil	□
Geoenvironmental Boring	⊕
U/G Test Hole LOS A (S.U.E.*)	⊕
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

# SURVEY CONTROL SHEET R-5749

L			
TYPE	STATION	NORTH	EAST
TS	10+00.00	213301.3613	2116951.4448
SC	12+00.00	213220.2811	2117134.2718
CS	57+91.18	212263.9140	2121593.3979
ST	59+91.18	212262.8884	2121793.3945
POT	88+00.00	212256.6560	2124602.2148

Y			
TYPE	STATION	NORTH	EAST
POT	10+00.00	214289.9083	2120913.8824
POT	49+99.54	210291.5532	2121011.2685

YRPA			
TYPE	STATION	NORTH	EAST
POT	5+00.00	212328.1498	2122802.3641
TS	8+16.23	212351.5510	2122487.0009
SC	10+40.23	212373.7503	2122264.1609
CS	18+29.71	212689.3434	2121550.6889
ST	20+53.71	212839.2888	2121384.3554
TS	21+15.39	212881.7271	2121339.6020
SC	23+15.39	213010.9168	2121187.2492
PT	25+28.23	213096.2484	2120993.4769
POT	25+80.52	213188.5477	2120942.6563

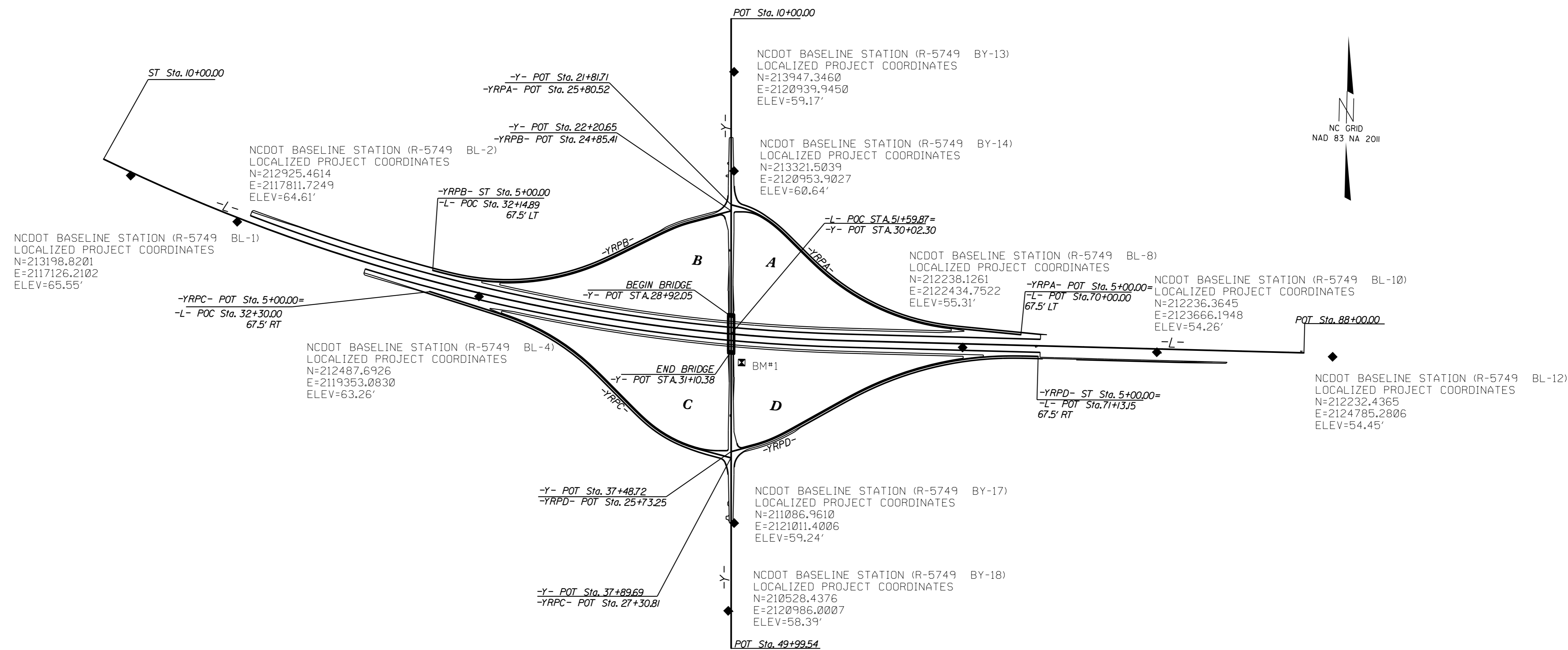
YRPB			
TYPE	STATION	NORTH	EAST
CS	5+00.00	212645.8769	2119057.8393
SC	7+24.00	212600.5137	2119277.1255
CS	15+50.30	212705.3519	2120085.9735
ST	17+74.30	212804.4707	2120286.7867
TS	19+54.52	212888.2841	2120446.3221
SC	21+57.52	212975.0498	2120629.6885
PT	22+16.05	212993.5866	2120685.2000
POT	24+85.41	213069.6159	2120943.6045

YRPC			
TYPE	STATION	NORTH	EAST
POT	5+00.00	212511.0720	2119041.0816
TS	8+72.81	212407.1664	2119399.1232
SC	10+96.81	212339.3475	2119612.9502
CS	15+88.94	212094.0844	2120036.5914
ST	18+12.94	211942.9018	2120201.8013
TS	19+83.31	211824.7540	2120324.5463
SC	21+86.31	211690.2995	2120476.4459
PT	25+13.19	211552.2368	2120770.2982
POT	27+30.81	211501.0483	2120981.8094

YRPD			
TYPE	STATION	NORTH	EAST
TS	5+00.00	212192.8991	2122915.2098
SC	7+24.00	212189.4853	2122691.2631
CS	16+42.79	211950.6584	2121811.3597
ST	18+66.79	211840.3763	2121616.4197
TS	21+17.09	211713.3451	2121400.7490
SC	23+20.09	211617.7795	2121221.8112
PT	24+17.97	211584.5534	2121129.8093
POT	25+73.25	211540.7236	2120980.8430

BL	POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1	R-5749	BL1	213198.8201	2117126.2102	65.95	12+81.20	22.89 RT
2	R-5749	BL2	212925.4614	211781.7249	64.61	19+37.86	22.96 RT
3	R-5749	BL3	212677.6386	2118578.9071	64.17	27+42.56	23.05 RT
4	R-5749	BL4	212487.6926	2119353.0830	63.26	35+38.34	21.92 RT
5	R-5749	BL5	212399.8873	2120802.8535	62.49	42+77.98	20.51 RT
6	R-5749	BL6	212281.5370	2120992.7480	61.03	51+90.34	4.71 RT
7	R-5749	BL7	212239.4486	2121704.6848	57.71	59+87.56	23.67 RT
8	R-5749	BL8	212238.1261	2122434.7522	55.31	66+32.59	23.34 RT
9	R-5749	BL9	212236.7119	2123062.5230	54.35	72+60.36	23.36 RT
10	R-5749	BL10	212236.3645	2123666.1948	54.26	78+64.03	22.37 RT
11	R-5749	BL11	212233.6779	2124217.2018	54.86	84+15.04	23.83 RT
12	R-5749	BL12	212232.4365	2124785.2806	54.45	OUTSIDE PROJECT LIMITS	

BY	POINT	DESC.	NORTH	EAST	ELEVATION	Y STATION	OFFSET
13	R-5749	BY13	213947.3460	2120939.9450	59.17	13+43.10	17.71 LT
14	R-5749	BY14	213321.5039	2120953.9027	60.64	19+69.89	16.43 LT
15	R-5749	BY15	212745.1394	2120966.9922	61.94	25+45.60	15.48 LT
16	R-5749	BY16	212281.5370	2120992.7480	61.03	30+09.70	29.94 LT
17	R-5749	BY17	211667.3027	2120999.2576	60.20	36+23.91	21.49 LT
18	R-5749	BY18	211086.9610	2121011.4006	59.24	42+04.37	19.58 LT
19	R-5749	BY18	210528.4376	2120986.0007	58.39	47+62.11	19.49 RT



### DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "R5749-2"

WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF  
 NORTHING: 213643.2410(ft) EASTING: 2116138.3780(ft)  
 ELEVATION: 66.46(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.00000266

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "R5749-2" TO -L- STATION 10+00.00 IS  
 N 59°35'53.92"W 202.63'

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES  
 VERTICAL DATUM USED IS NAVD 88

### NOTES:

- INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL AND VERTICAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT. PROJECT CONTROL ESTABLISHED USING GNSS (GLOBAL NAVIGATION SATELLITE SYSTEM).
- THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:  
[HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION/](https://connect.ncdot.gov/resources/location/)
- THE FILES TO BE FOUND ARE AS FOLLOWS:  
 R-5749\_LS\_CONTROL.TXT
- SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

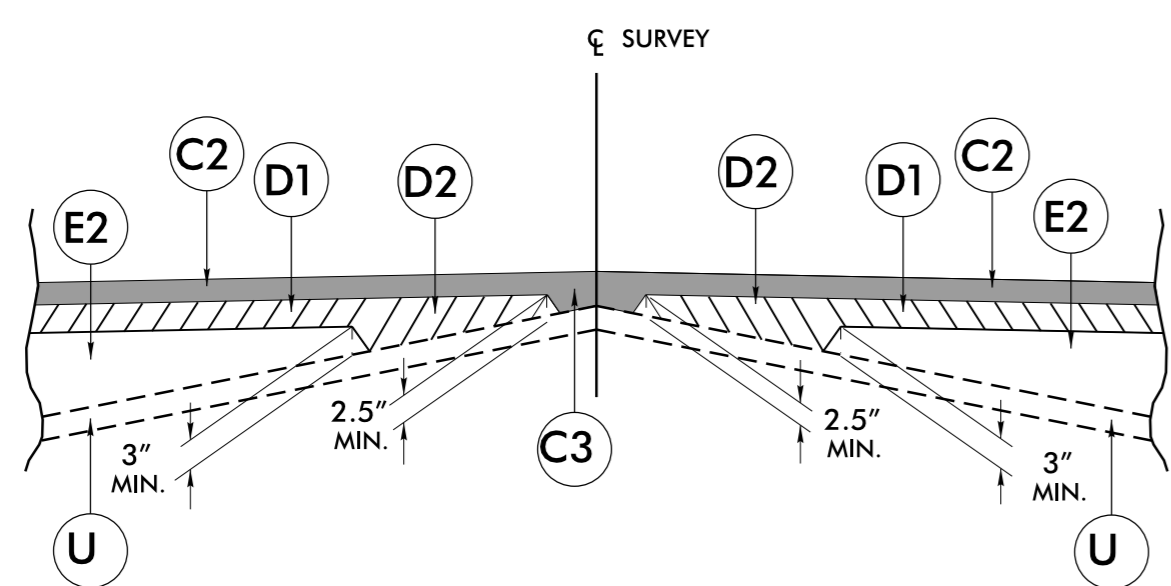
NOTE: DRAWING NOT TO SCALE

5/14/99

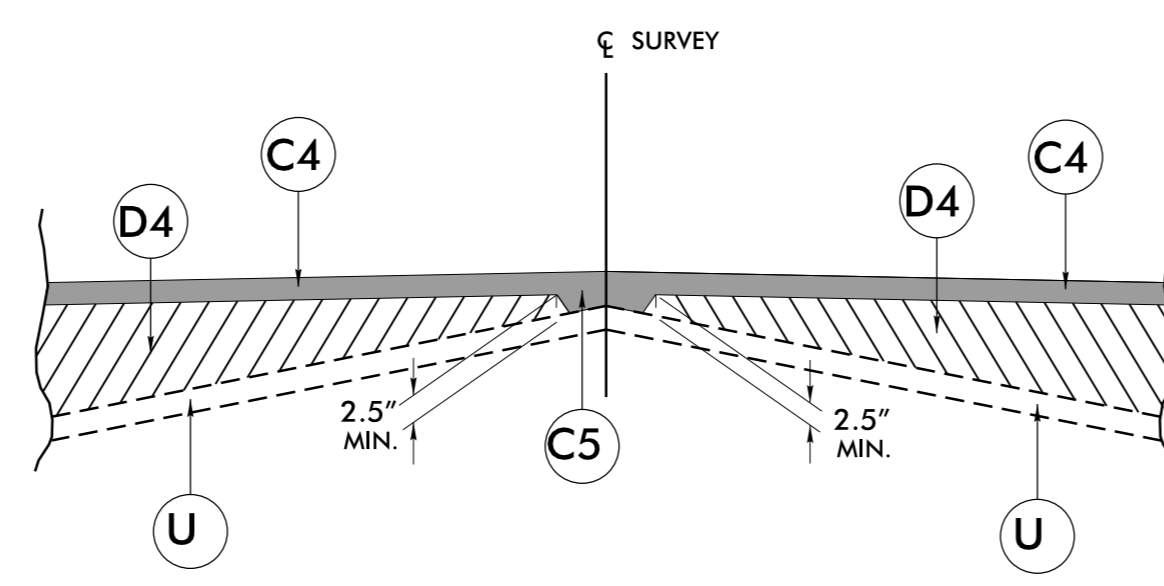
**PAVEMENT SCHEDULE**  
FINAL PAVEMENT DESIGN

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.	D3	PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	R1	5" MONOLITHIC CONCRETE ISLAND (KEYED IN)
C2	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	D4	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2.5" IN DEPTH OR GREATER THAN 4" IN DEPTH.	R2	SHOULDER BERM GUTTER (SBG)
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 2" IN DEPTH.	E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	T	EARTH MATERIAL
C4	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	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 3" IN DEPTH OR GREATER THAN 5.5" IN DEPTH.	U	EXIST. PAVEMENT
C5	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	J1	PROP. 8" AGGREGATE BASE COURSE	V	INCIDENTAL MILLING
C6	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	J2	PROP. 10" AGGREGATE BASE COURSE	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE -L- WEDGING DETAIL)
C7	PROP. APPROX. 2" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 224 LBS. PER SQ. YD.	L1	CLASS IV SUBGRADE STABILIZATION	W1	VARIABLE DEPTH ASPHALT PAVEMENT (SEE -Y- WEDGING DETAIL)
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	N1	GEOTEXTILE FOR SOIL STABILIZATION	W2	VARIABLE DEPTH ASPHALT PAVEMENT (SEE -DET- WEDGING DETAIL)
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" IN DEPTH OR GREATER THAN 4" IN DEPTH.	P1	PRIME COAT AT THE RATE OF .35 GAL. PER SQ. YD.	Y	MILLED RUMBLE STRIP

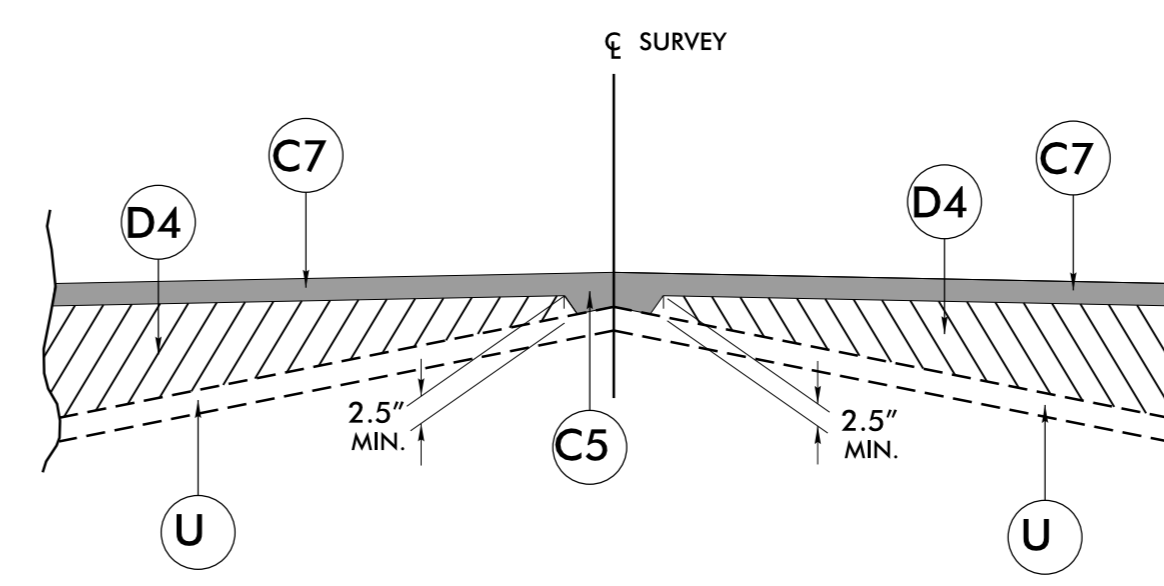
NOTE: ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



Detail Showing Method of Wedging - W

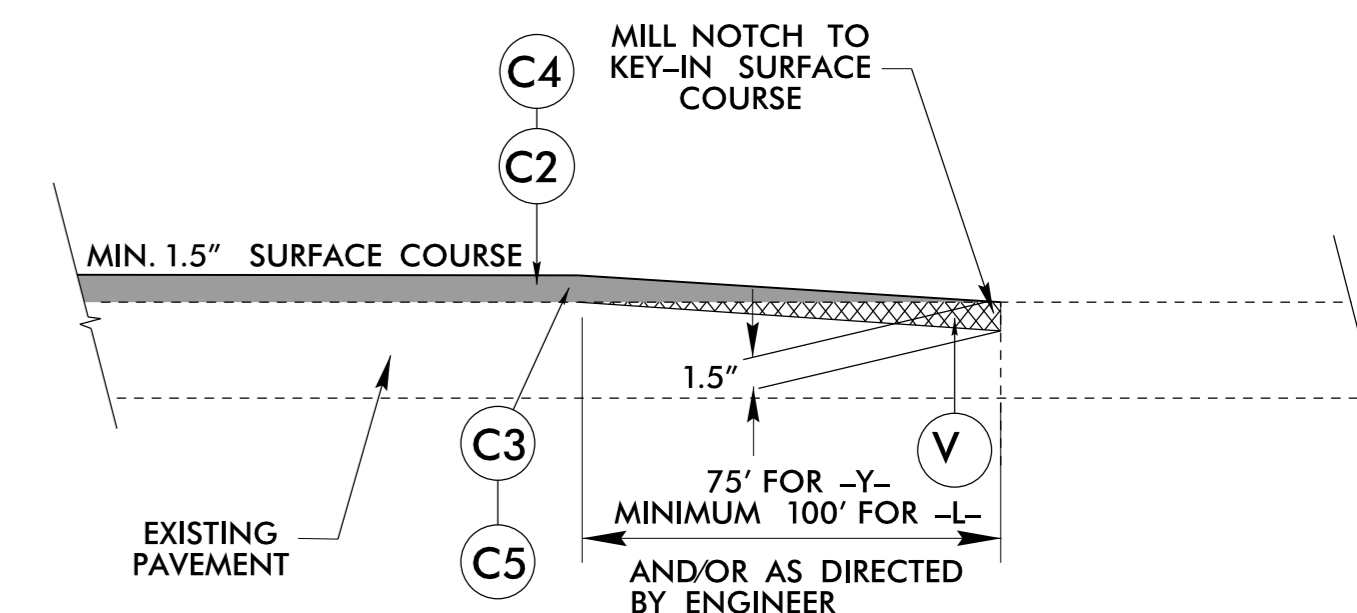


Detail Showing Method of Wedging - W1

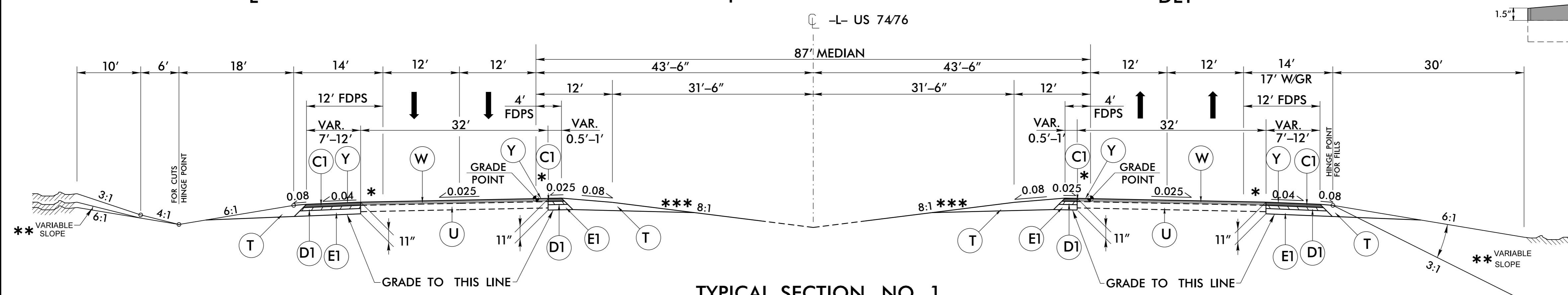


Detail Showing Method of Wedging - W2

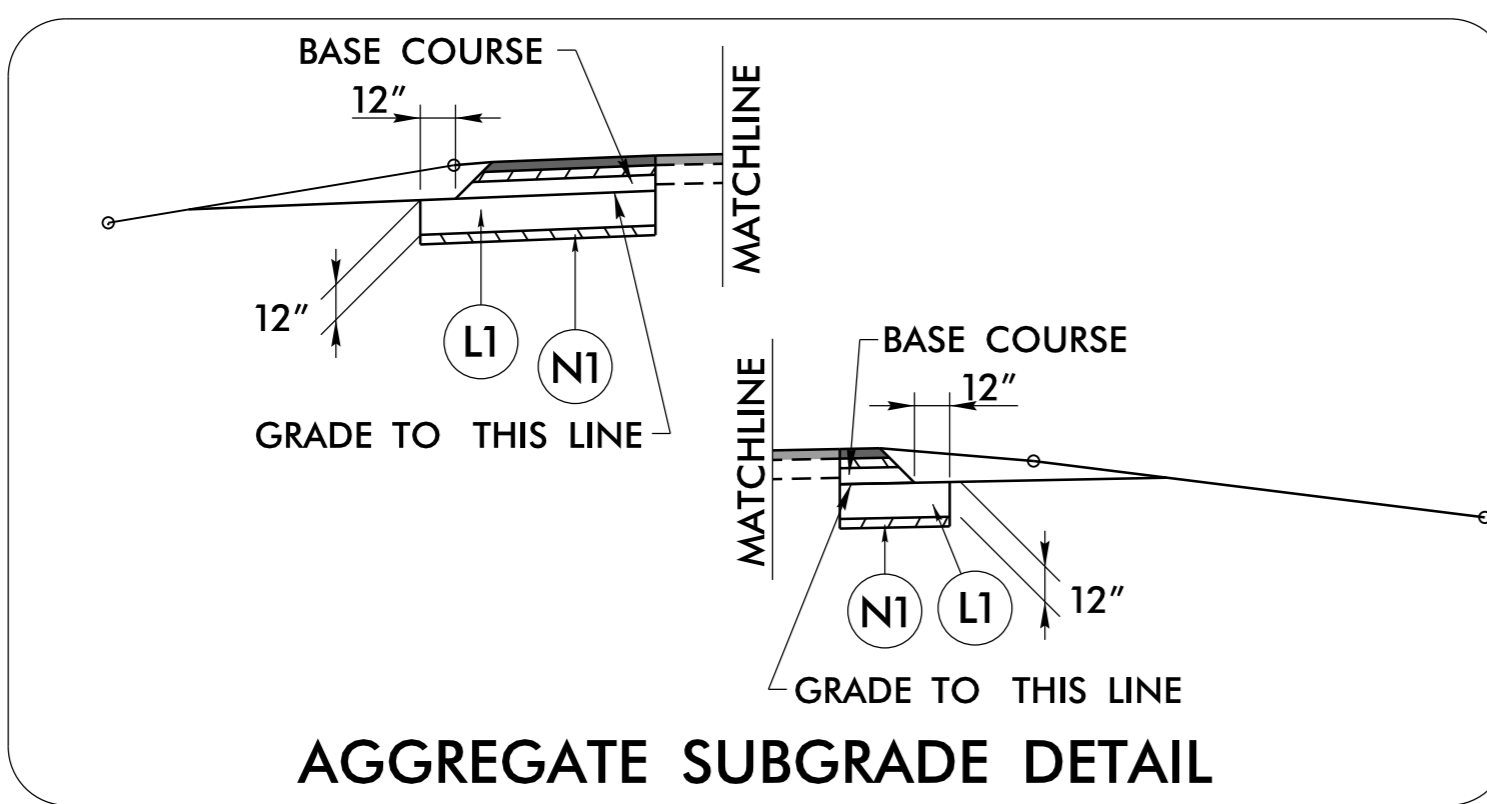
**MILLING DETAIL**  
INCIDENTAL MILLING AT BEGINNING FOR TIE-INS



-L- RT STA. 28+00.00 AND STA. 71+25.00  
-L- LT STA. 20+00.00 AND STA. 71+25.00  
-Y- STA. 17+55.00 AND STA. 42+00.00



TYPICAL SECTION NO. 1



AGGREGATE SUBGRADE DETAIL

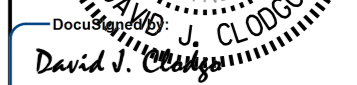
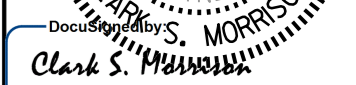




USE AGGREGATE SUBGRADE DETAIL IN CONJUNCTION WITH TYPICAL SECTION NO. 1, 1A, 1B, 2, & 2A

- L- STA. 26+25.00 (LT) TO STA. 27+75.00 (LT)
- L- STA. 30+25.00 TO STA. 31+75.00
- L- STA. 34+25.00 TO STA. 36+75.00
- L- STA. 66+75.00 TO STA. 69+75.00
- L- STA. 72+25.00 (RT) TO STA. 83+14.00 (RT)

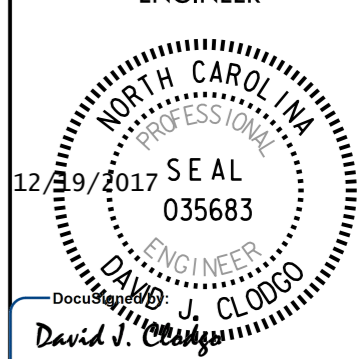
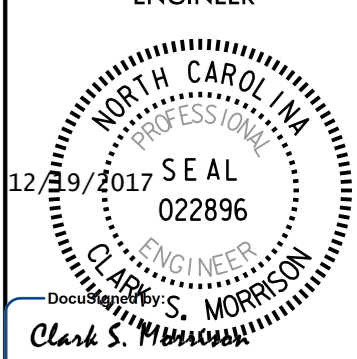
USE TYPICAL SECTION NO. 1

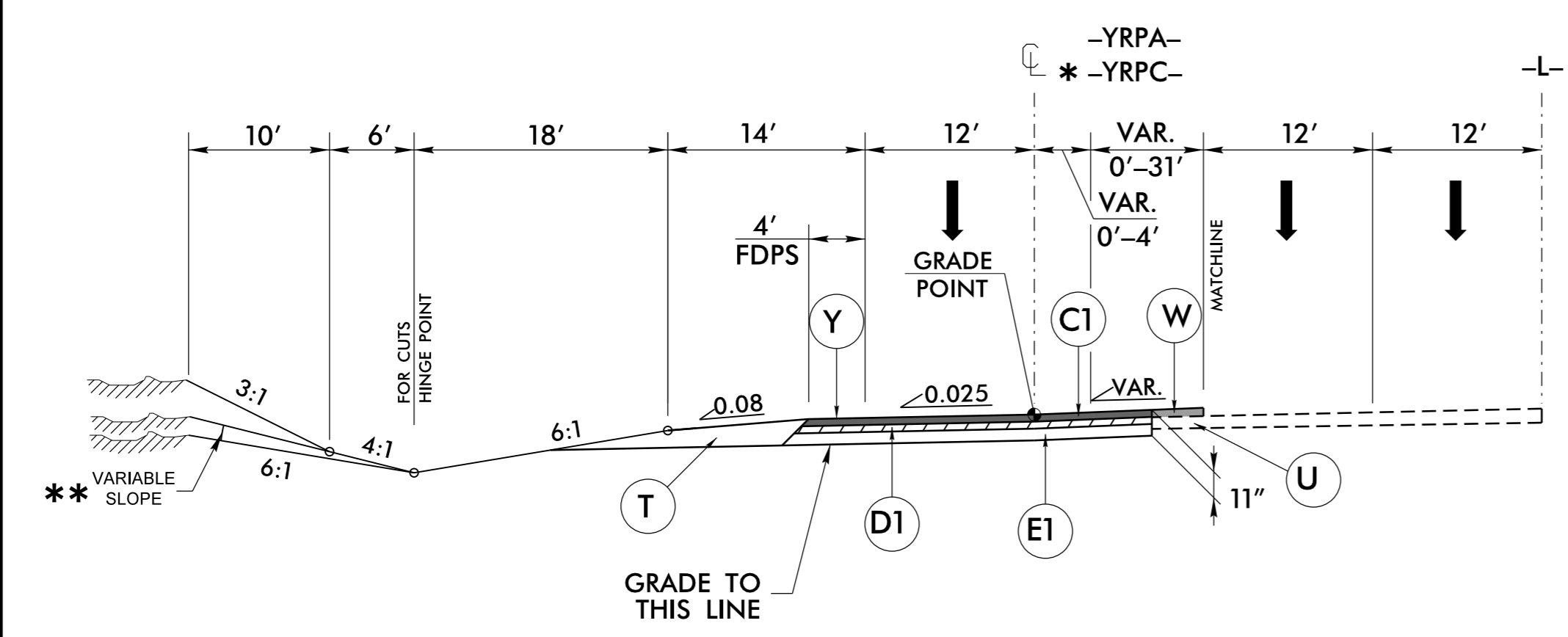
- L- RT STA. 28+00.00 TO STA. 71+25.00
- L- LT STA. 20+00.00 TO STA. 71+25.00

- \* MAINTAIN ROADWAY CROSS SLOPE OVER EXISTING PAVED SHOULDERS
- \*\* SEE CROSS SECTIONS FOR VARIABLE SLOPES. FILL SLOPES WITHIN THE INTERCHANGE WILL BE 4:1 OR FLATTER
- \*\*\* 8:1 TYPICAL. VARY AS NECESSARY TO MAINTAIN EXISTING MEDIAN CENTERLINE AND ELEVATION

PROJECT REFERENCE NO. R-5749	SHEET NO. 2A-1
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
ROADWAY DESIGN ENGINEER 	PAVEMENT DESIGN ENGINEER 
	
	

Invalid ExpressJob: R-5749\_Rdy\_tup.dgn  
USER: RDM/BOY

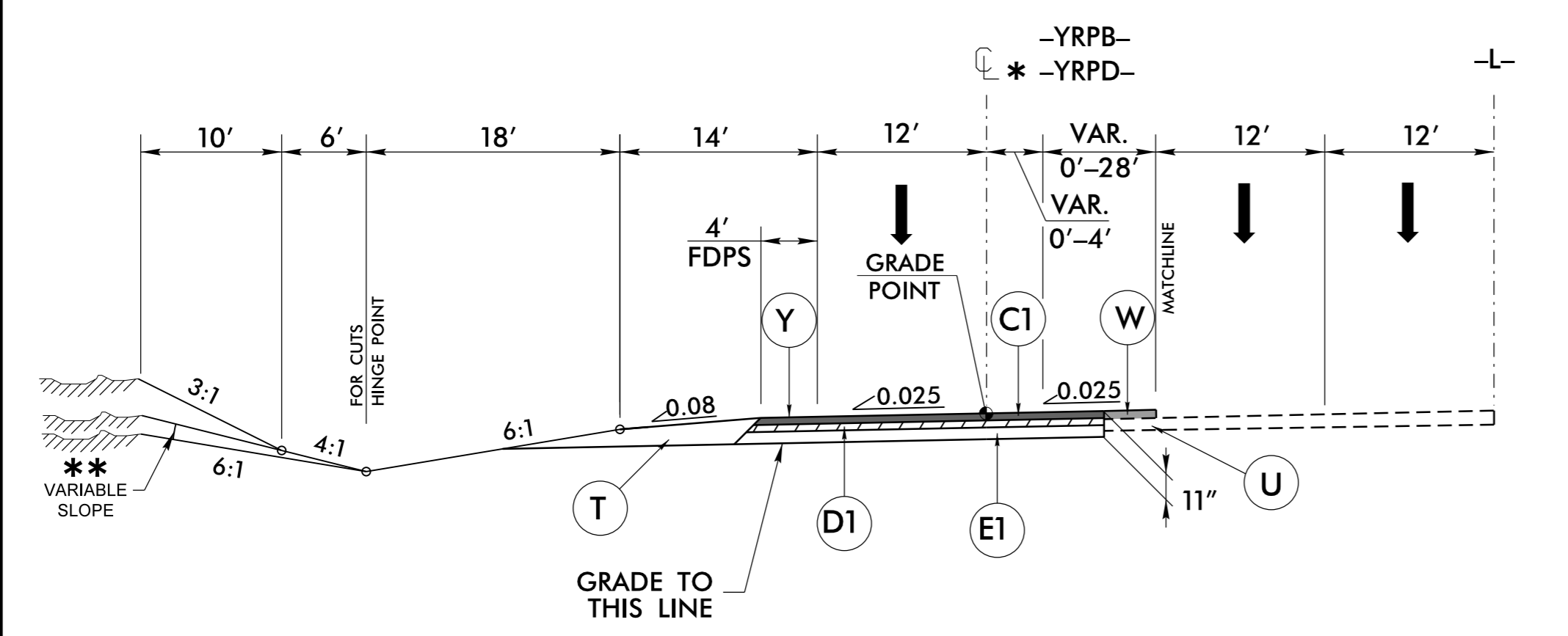
PROJECT REFERENCE NO. R-5749	SHEET NO. 2A-2
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
ROADWAY DESIGN ENGINEER 	PAVEMENT DESIGN ENGINEER 
<b>CDM Smith Inc.</b> 5400 Glenwood Avenue Suite 400 Raleigh, NC 27612-3228 NC CCA No. F-1255	



**TYPICAL SECTION NO. 1A**

USE TYPICAL SECTION NO. 1A IN CONJUNCTION WITH TYPICAL SECTION NO. 1:  
 \* MIRROR FOR -L/-YRPC-  
 \*\* SEE CROSS SECTIONS FOR VARIABLE SLOPES.

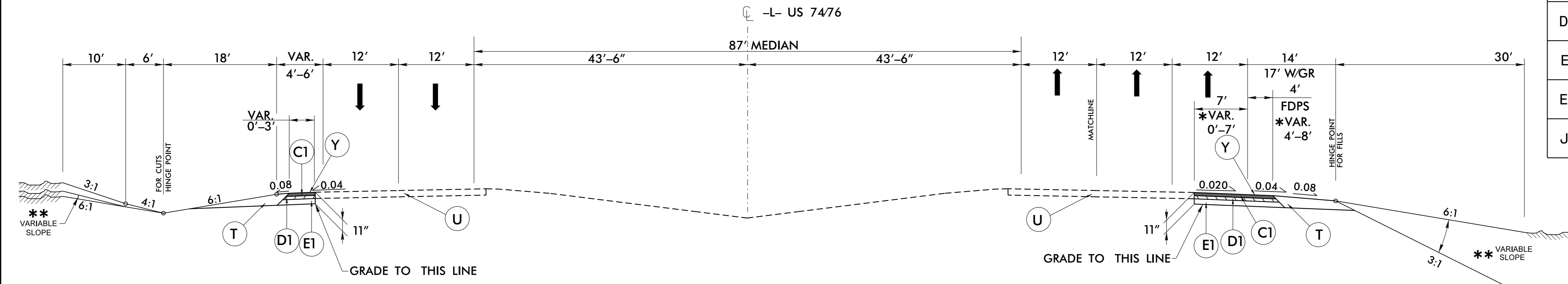
- L- STA. 65+66.54 TO STA. 70+00.00/-YRPA- STA. 5+00.00 TO STA. 9+32.80
- \* -L- STA. 32+30.00 TO STA. 36+90.60/-YRPC- STA. 5+00.00 TO STA. 9+39.95



**TYPICAL SECTION NO. 1B**

USE TYPICAL SECTION NO. 1B IN CONJUNCTION WITH TYPICAL SECTION NO. 1:  
 \* MIRROR FOR -L/-YRPD-  
 \*\* SEE CROSS SECTIONS FOR VARIABLE SLOPES.

- L- STA. 32+14.89 TO STA. 36+52.56/-YRPB- STA. 5+00.00 TO STA. 9+32.98
- \* -L- STA. 66+37.58 TO STA. 71+13.15/-YRPD- STA. 5+00.00 TO STA. 9+73.96



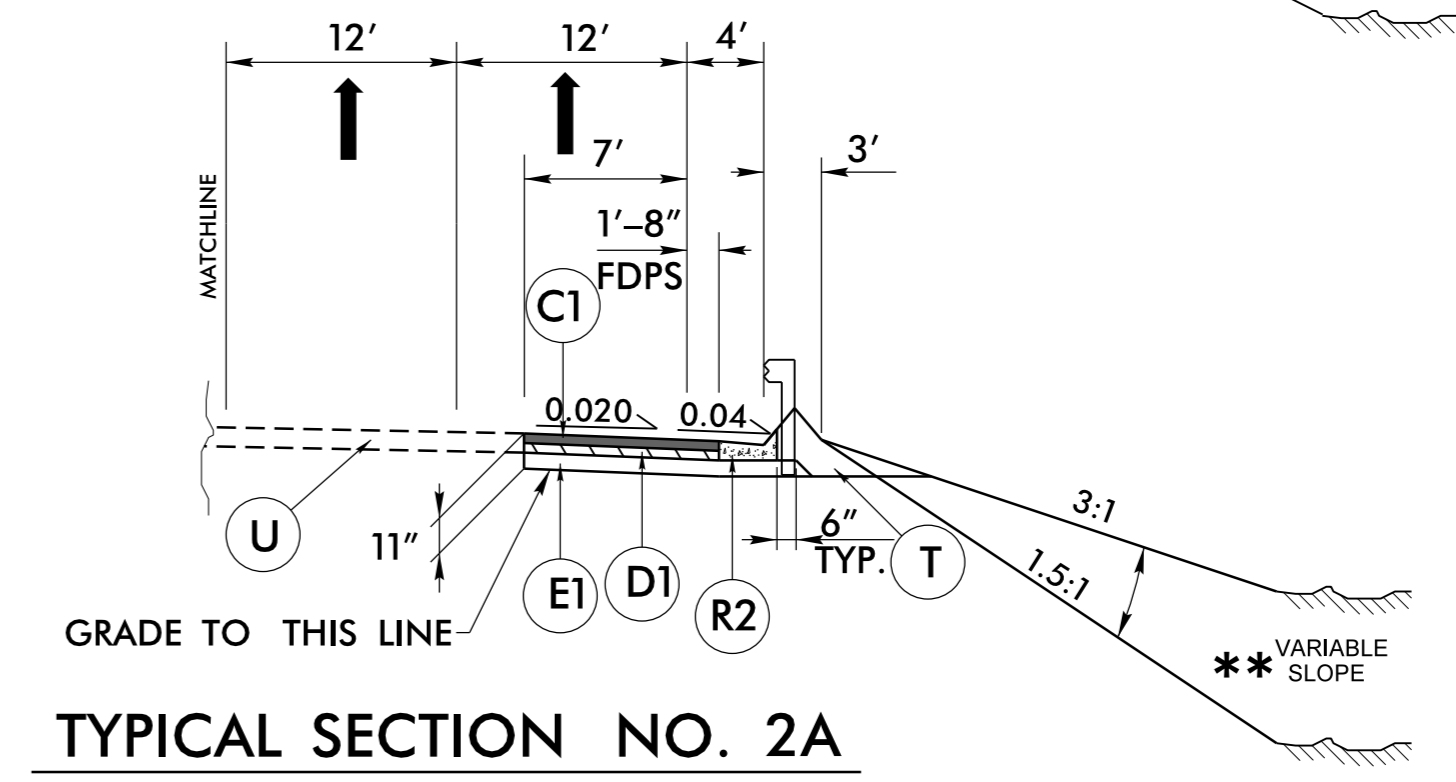
**TYPICAL SECTION NO. 2**

SEE AGGREGATE SUBGRADE DETAIL ON SHEET 2A-1 FOR LOCATIONS WITHIN TYPICAL SECTION NO. 2

**USE TYPICAL SECTION NO. 2**

- L- RT STA. 71+25.00 TO STA. 80+13.15
- L- LT STA. 71+25.00 TO STA. 71+64.94
- \* -L- RT STA. 80+13.15 TO STA. 83+14.00


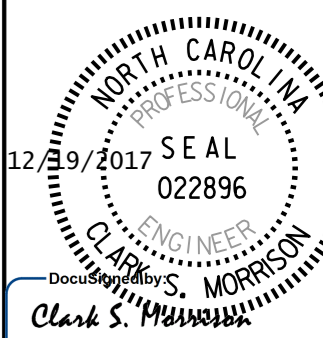

\*\* SEE CROSS SECTIONS FOR VARIABLE SLOPES.

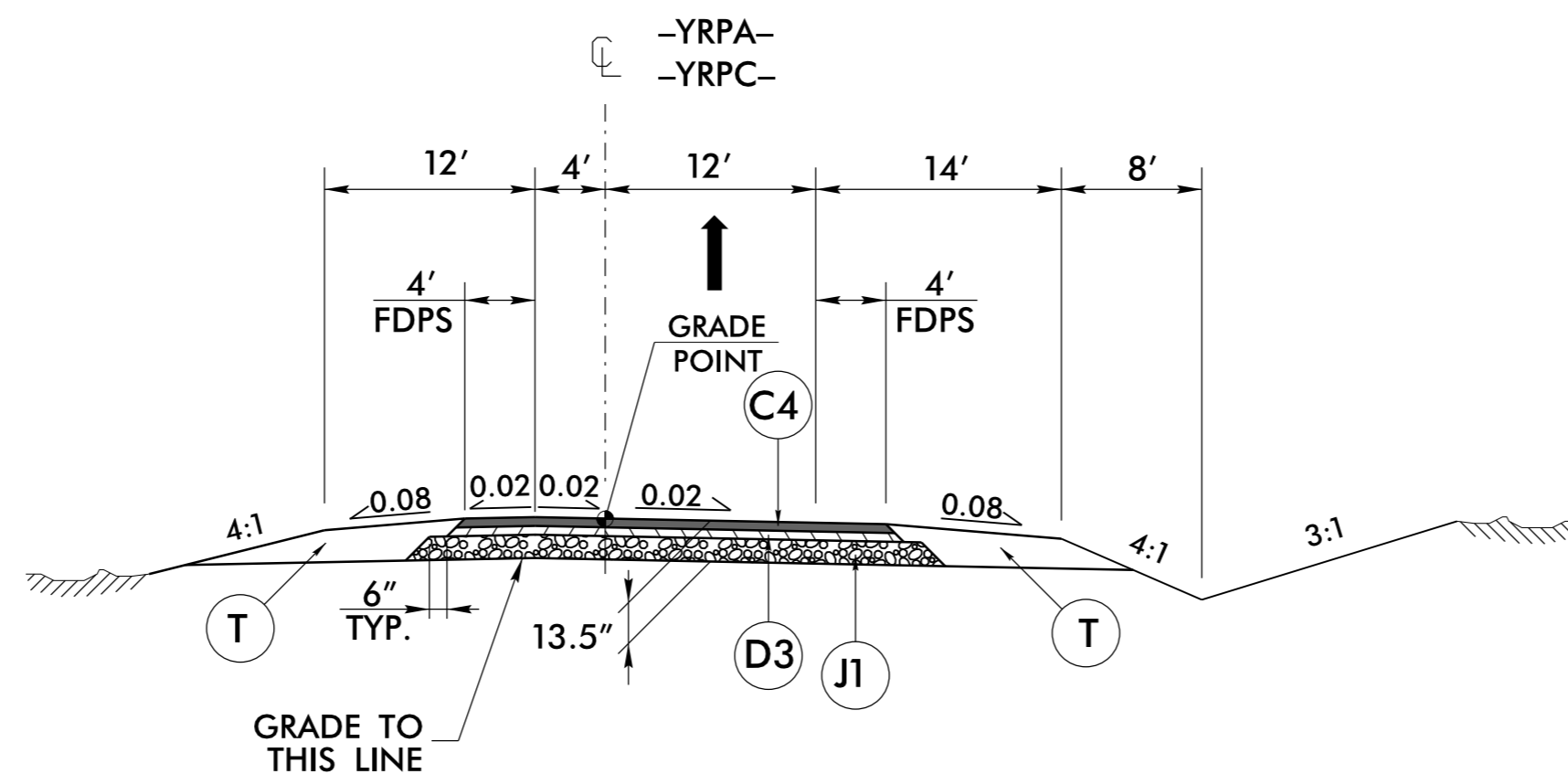


**TYPICAL SECTION NO. 2A**

USE TYPICAL SECTION NO. 2A IN CONJUNCTION WITH TYPICAL SECTION NO. 2:  
 -L- RT STA. 71+42.97 TO STA. 73+55.47

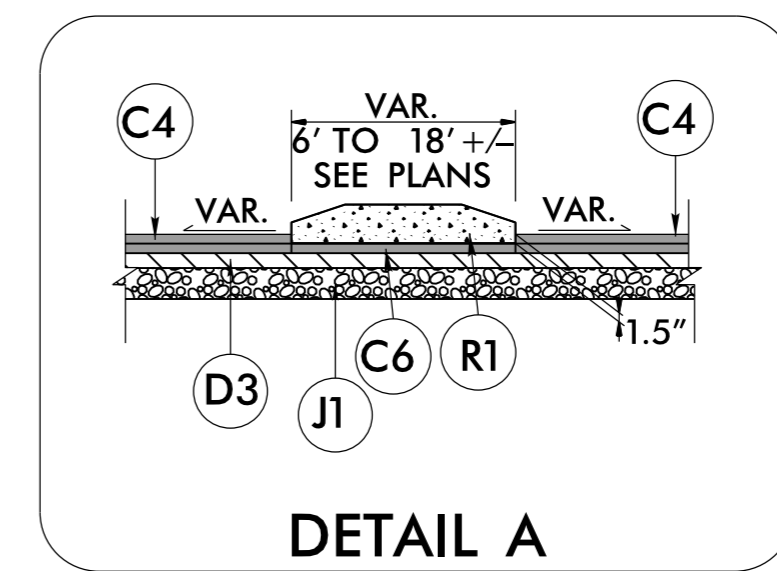
PAVEMENT SCHEDULE		
C1	3" S9.5C	J2 10" ABC
C2	1.5" S9.5C	L1 CLASS IV SUBGRADE STABILIZATION
C3	VAR. S9.5C	N1 GEOTEXTILE FOR SOIL STABILIZATION
C4	3" S9.5B	P1 .35 PRIME COAT
C5	VAR. S9.5B	R1 5" MONO. CONC. (K.I.)
C6	1.5" S9.5B	R2 SHOULDER BERM GUTTER (SBG)
C7	2" S9.5B	T EARTH MATERIAL
D1	4" I19.0C	U EXIST. PAVEMENT
D2	VAR. I19.0C	V INCIDENTAL MILLING
D3	2.5" I19.0B	W WEDGING
D4	VAR. I19.0B	W1 WEDGING
E1	4" B25.0C	W2 WEDGING
E2	VAR. B25.0C	Y MILLED RUMBLE STRIP
J1	8" ABC	PAVEMENT EDGESLOPES 1:1 UNLESS NOTED OTHERWISE

PROJECT REFERENCE NO. R-5749	SHEET NO. 2A-3
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
ROADWAY DESIGN ENGINEER 	PAVEMENT DESIGN ENGINEER 
 <small>CDM Smith Inc. 5400 Glenwood Avenue Suite 400 Raleigh, NC 27615-3228 NC CPA No. 27-255</small>	

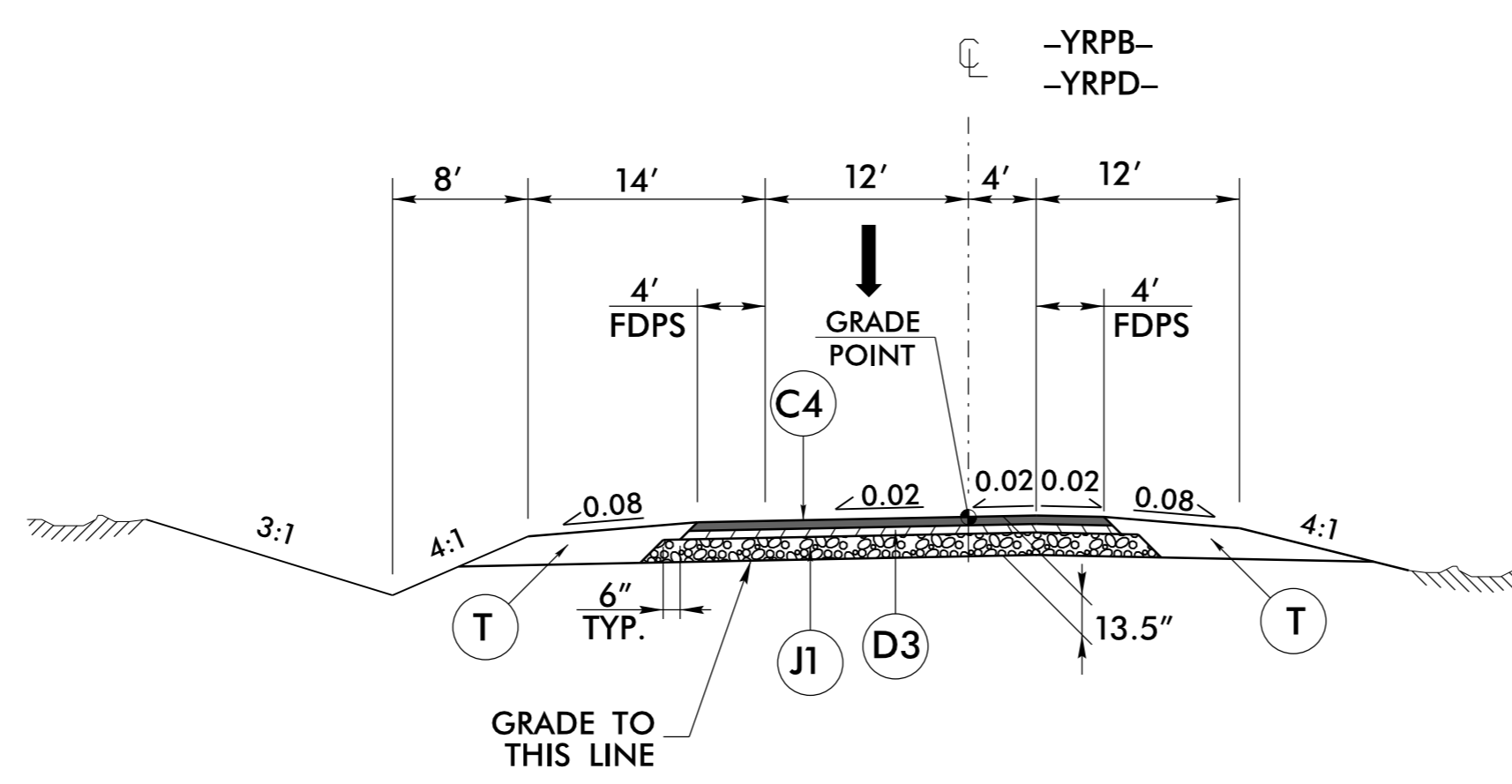


**TYPICAL SECTION NO. 3**

**USE TYPICAL SECTION NO. 3**  
 -YRPA- STA. 9+32.80 TO STA. 25+61.88  
 -YRPC- STA. 9+63.02 TO STA. 27+12.17



**USE DETAIL A IN CONJUNCTION  
WITH TYPICAL SECTION NO. 3**  
 -YRPA- STA. 25+04.62 TO STA. 25+54.66  
 -YRPC- STA. 26+50.79 TO STA. 27+04.95



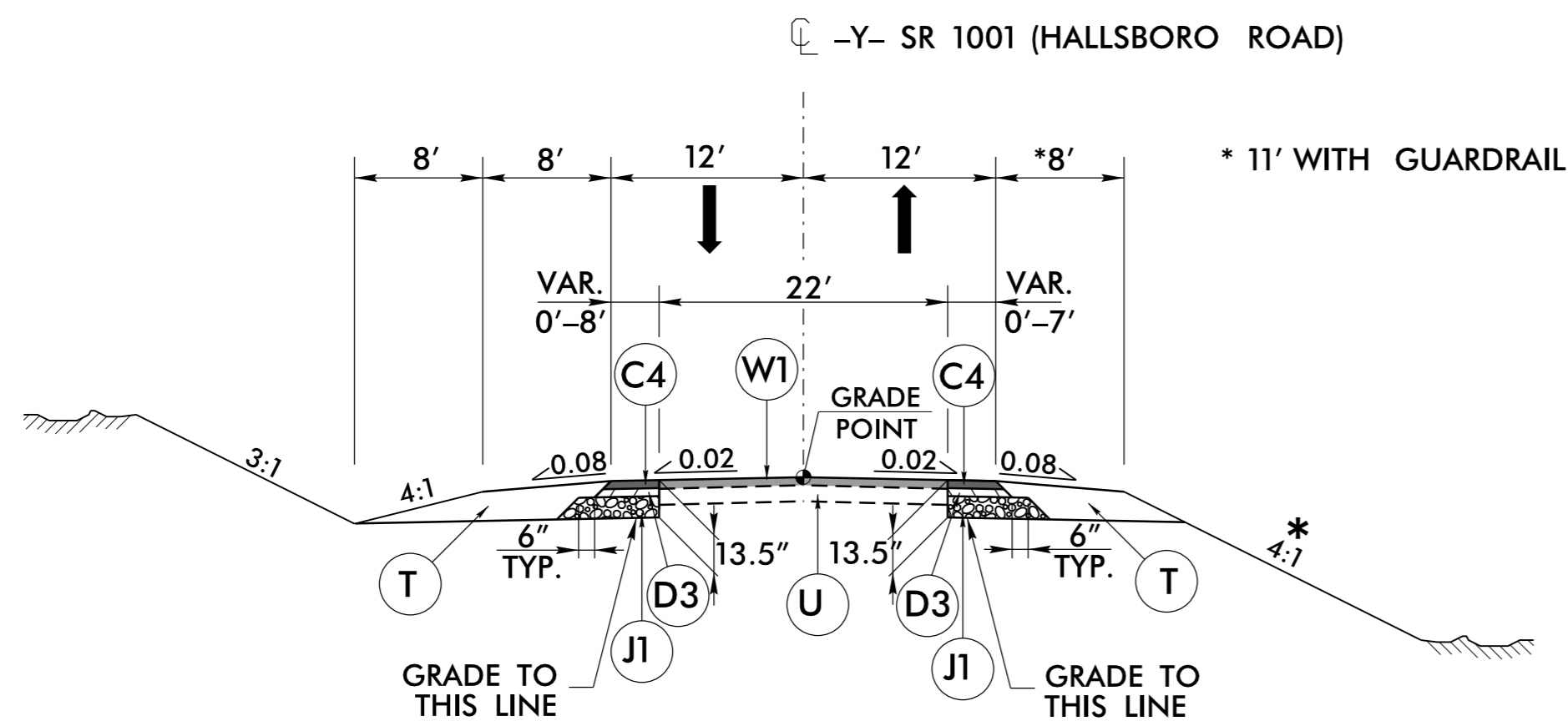
**TYPICAL SECTION NO. 4**

**USE TYPICAL SECTION NO. 4**  
 -YRPB- STA. 9+32.98 TO STA. 24+63.86  
 -YRPD- STA. 9+73.96 TO STA. 25+51.95

PAVEMENT SCHEDULE			
C1	3" S9.5C	J2	10" ABC
C2	1.5" S9.5C	L1	CLASS IV SUBGRADE STABILIZATION
C3	VAR. S9.5C	N1	GEOTEXTILE FOR SOIL STABILIZATION
C4	3" S9.5B	P1	.35 PRIME COAT
C5	VAR. S9.5B	R1	5" MONO. CONC. (K.I.)
C6	1.5" S9.5B	R2	SHOULDER BERM GUTTER (SBG)
C7	2" S9.5B	T	EARTH MATERIAL
D1	4" I19.0C	U	EXIST. PAVEMENT
D2	VAR. I19.0C	V	INCIDENTAL MILLING
D3	2.5" I19.0B	W	WEDGING
D4	VAR. I19.0B	W1	WEDGING
E1	4" B25.0C	W2	WEDGING
E2	VAR. B25.0C	Y	MILLED RUMBLE STRIP
J1	8" ABC	PAVEMENT EDGESLOPES 1:1 UNLESS NOTED OTHERWISE	



5/14/99

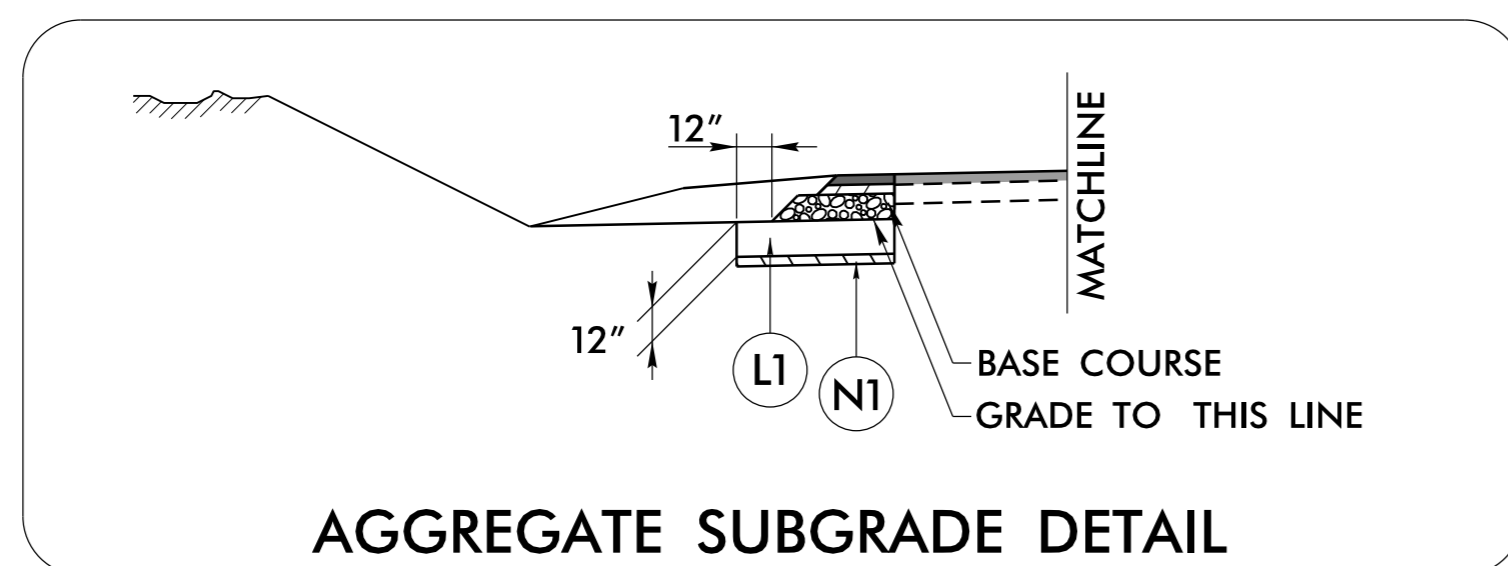


**TYPICAL SECTION NO. 5**

**USE TYPICAL SECTION NO. 5**

-Y- STA. 17+55.00 TO STA. 21+00.00  
 -Y- STA. 38+80.00 TO STA. 42+00.00

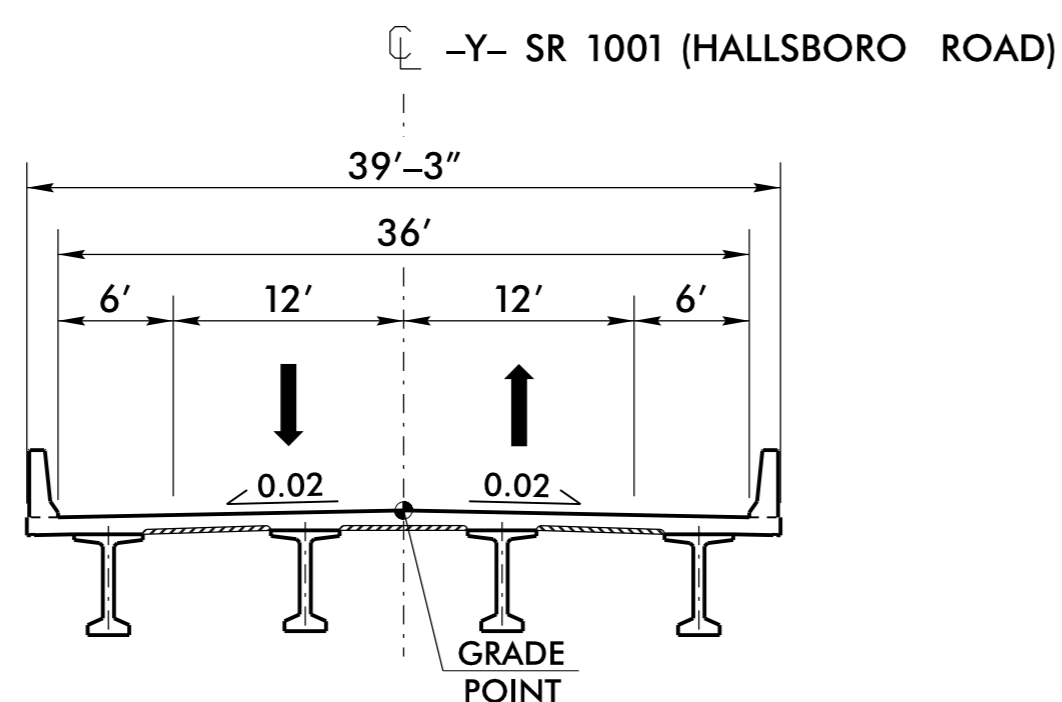
\* SEE CROSS SECTIONS FOR VARIABLE SLOPES.



**AGGREGATE SUBGRADE DETAIL**

**USE AGGREGATE SUBGRADE DETAIL IN CONJUNCTION WITH TYPICAL SECTION NO. 5**

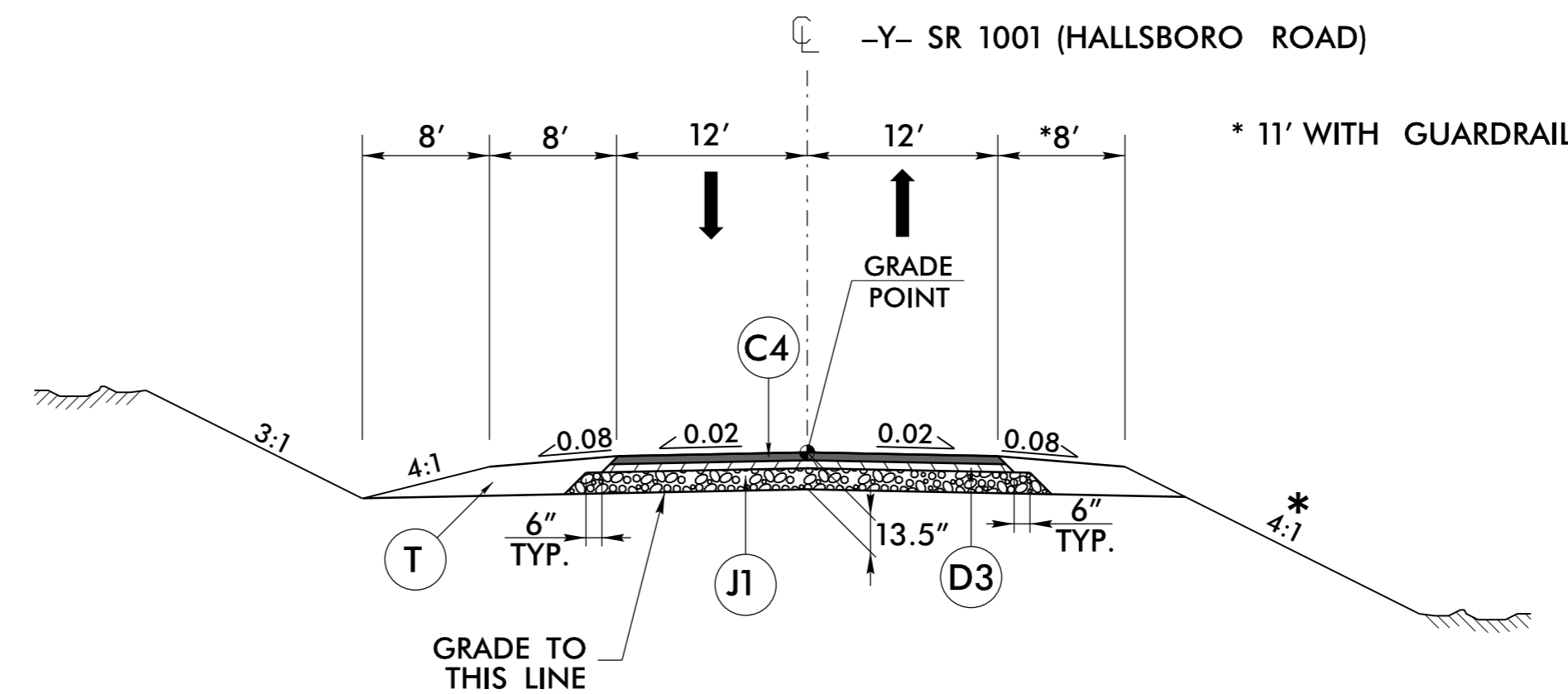
-Y- STA. 17+75.00 TO STA. 19+25.00  
 -Y- STA. 19+75.00 TO STA. 20+25.00  
 -Y- STA. 40+25.00 TO STA. 41+75.00



**TYPICAL SECTION NO. 7**

**USE BRIDGE TYPICAL SECTION NO. 7**

-Y- STA. 28+92.05 (BEGIN BRIDGE) TO STA. 31+10.38 (END BRIDGE)

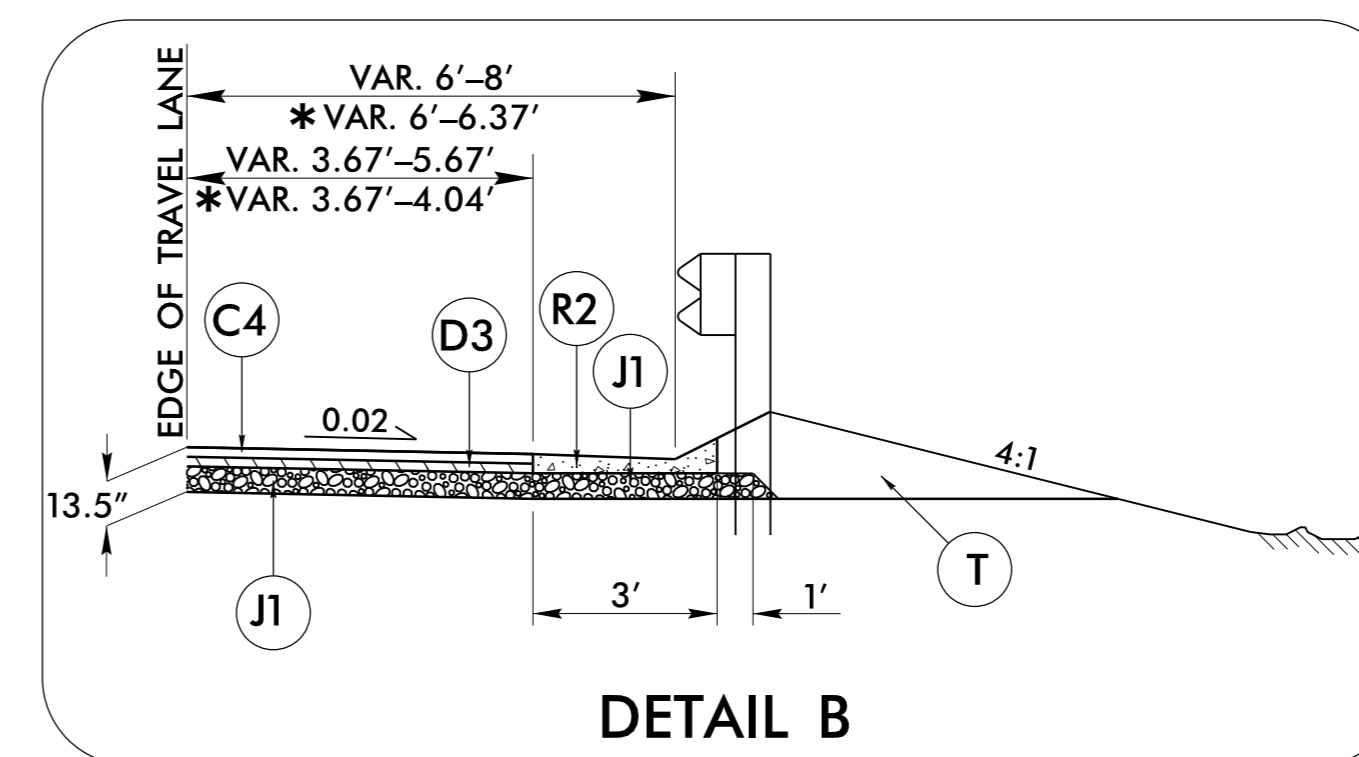


**TYPICAL SECTION NO. 6**

**USE TYPICAL SECTION NO. 6**

-Y- STA. 21+00.00 TO STA. 28+92.05 (BEGIN BRIDGE)  
 -Y- STA. 31+10.38 (END BRIDGE) TO STA. 38+80.00


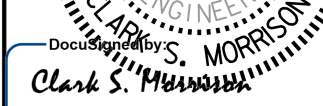
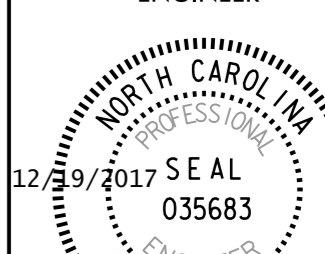
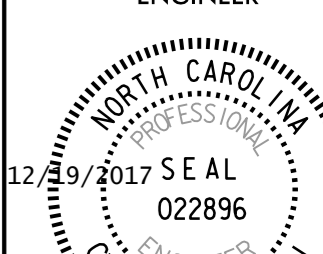


\* SEE CROSS SECTIONS FOR VARIABLE SLOPES.



**DETAIL B**

**USE DETAIL B IN CONJUNCTION WITH TYPICAL SECTION NO. 6**

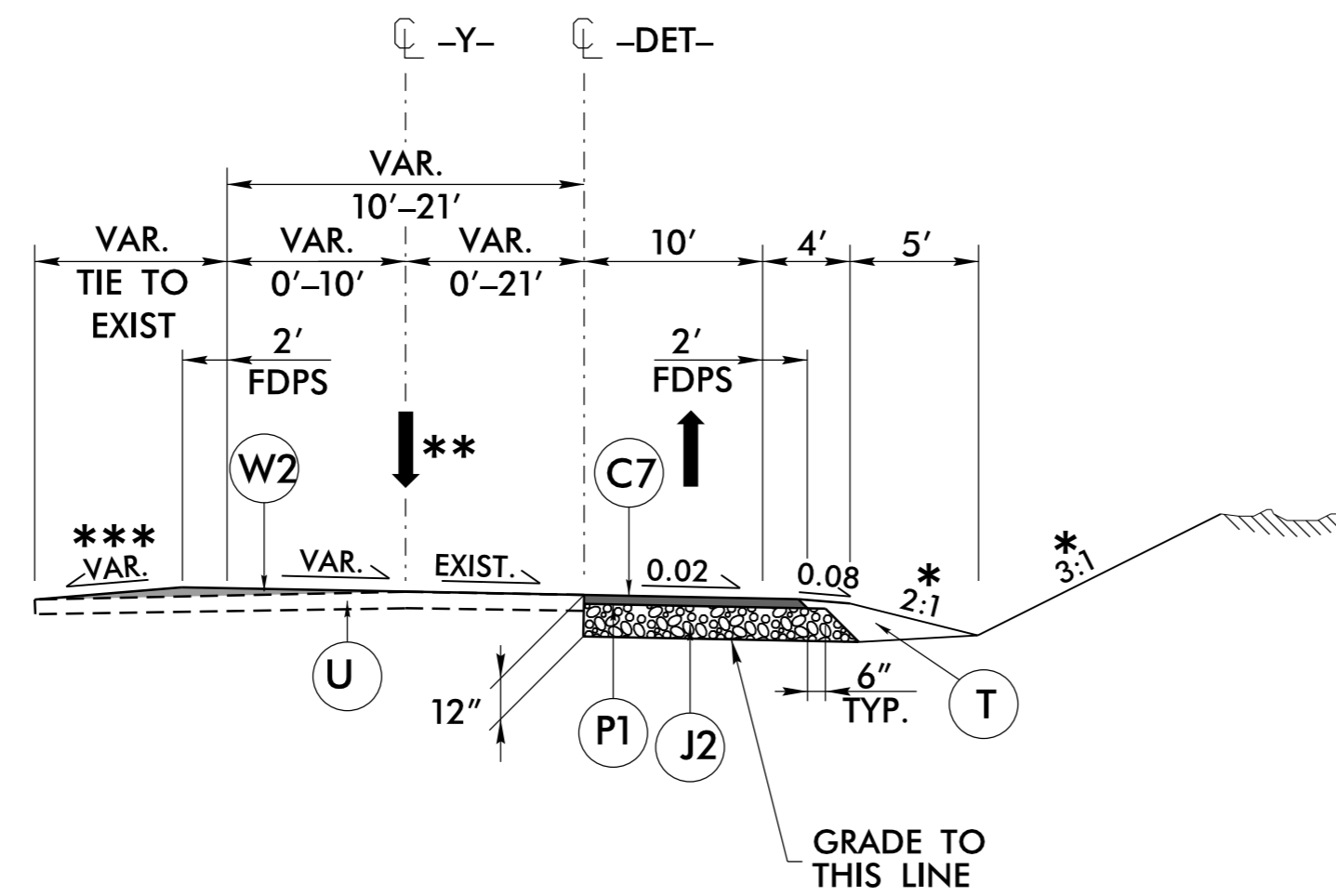
-Y- STA. 27+28.32 (RT) TO STA. 28+75.76 (RT)  
 \* -Y- STA. 28+56.21 (LT) TO STA. 28+78.71 (LT)  
 \* -Y- STA. 31+25.89 (RT) TO STA. 31+48.38 (RT)  
 -Y- STA. 31+28.83 (LT) TO STA. 32+76.27 (LT)

PROJECT REFERENCE NO. R-5749	SHEET NO. 2A-4
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
ROADWAY DESIGN ENGINEER  David J. Clodges	PAVEMENT DESIGN ENGINEER  Clark S. Morrison
	
	

**PAVEMENT SCHEDULE**

C1	3" S9.5C	J2	10" ABC
C2	1.5" S9.5C	L1	CLASS IV SUBGRADE STABILIZATION
C3	VAR. S9.5C	N1	GEOTEXTILE FOR SOIL STABILIZATION
C4	3" S9.5B	P1	.35 PRIME COAT
C5	VAR. S9.5B	R1	5" MONO. CONC. (K.I.)
C6	1.5" S9.5B	R2	SHOULDER BERM GUTTER (SBG)
C7	2" S9.5B	T	EARTH MATERIAL
D1	4" I19.0C	U	EXIST. PAVEMENT
D2	VAR. I19.0C	V	INCIDENTAL MILLING
D3	2.5" I19.0B	W	WEDGING
D4	VAR. I19.0B	W1	WEDGING
E1	4" B25.0C	W2	WEDGING
E2	VAR. B25.0C	Y	MILLED RUMBLE STRIP
J1	8" ABC	PAVEMENT EDGESLOPES 1:1 UNLESS NOTED OTHERWISE	

5/14/19

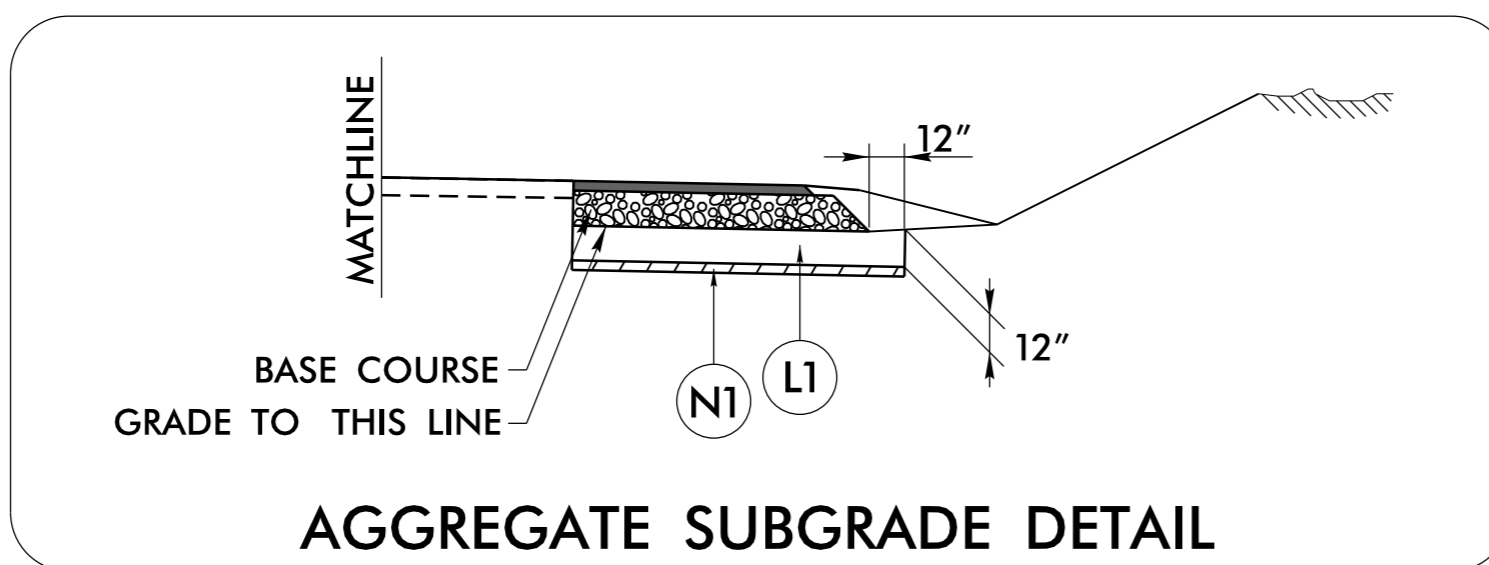


**TYPICAL SECTION NO. 8**

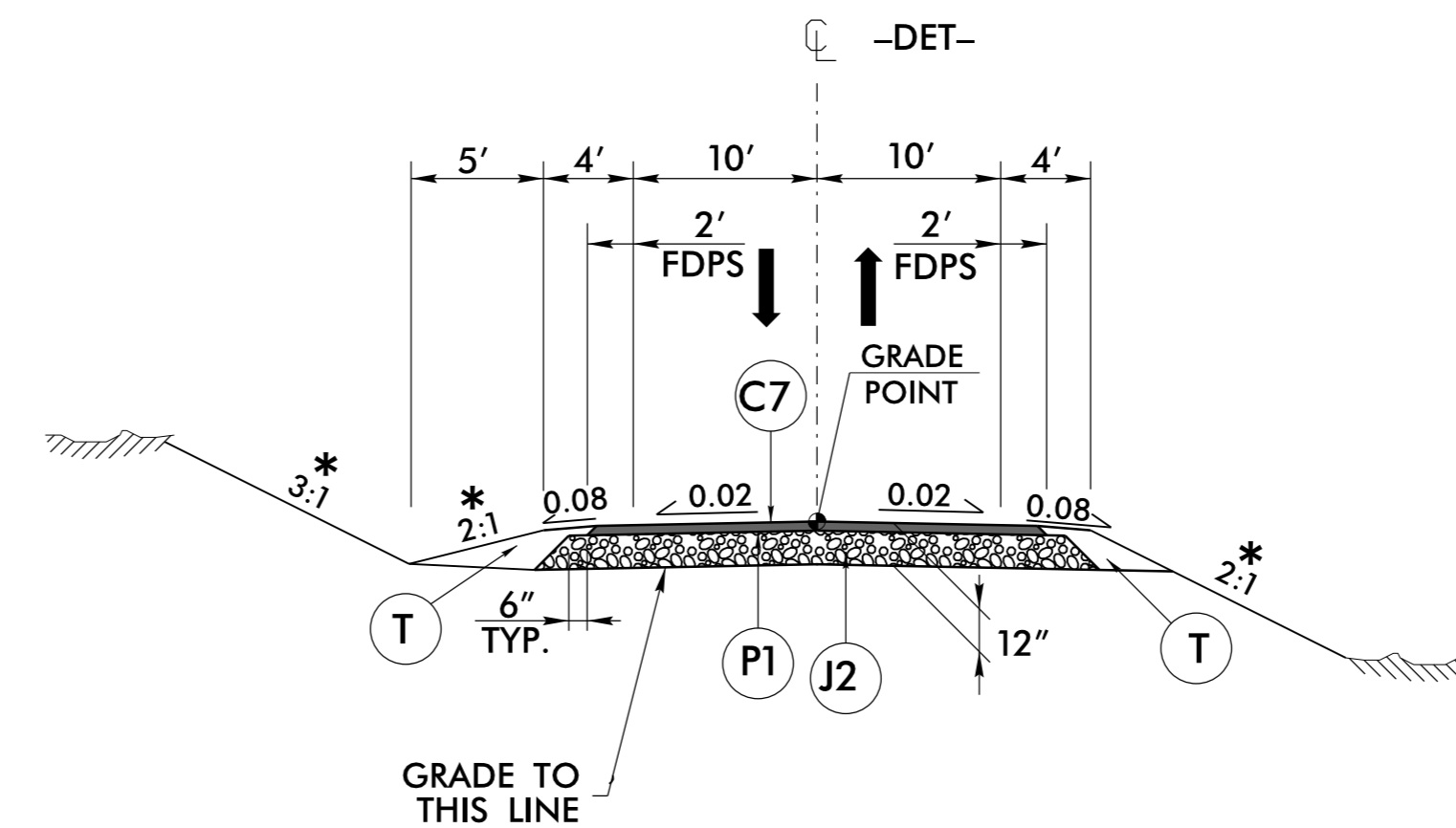
USE TYPICAL SECTION NO. 8

-DET- STA. 8+90.00 TO STA. 12+25.00  
 -DET- STA. 30+66.50 TO STA. 34+07.16

- \* SEE CROSS SECTIONS FOR VARIABLE SLOPES
- \*\* LANE LOCATION VARIES
- \*\*\* MAXIMUM .06 ROLLOVER



**AGGREGATE SUBGRADE DETAIL**



**TYPICAL SECTION NO. 9**

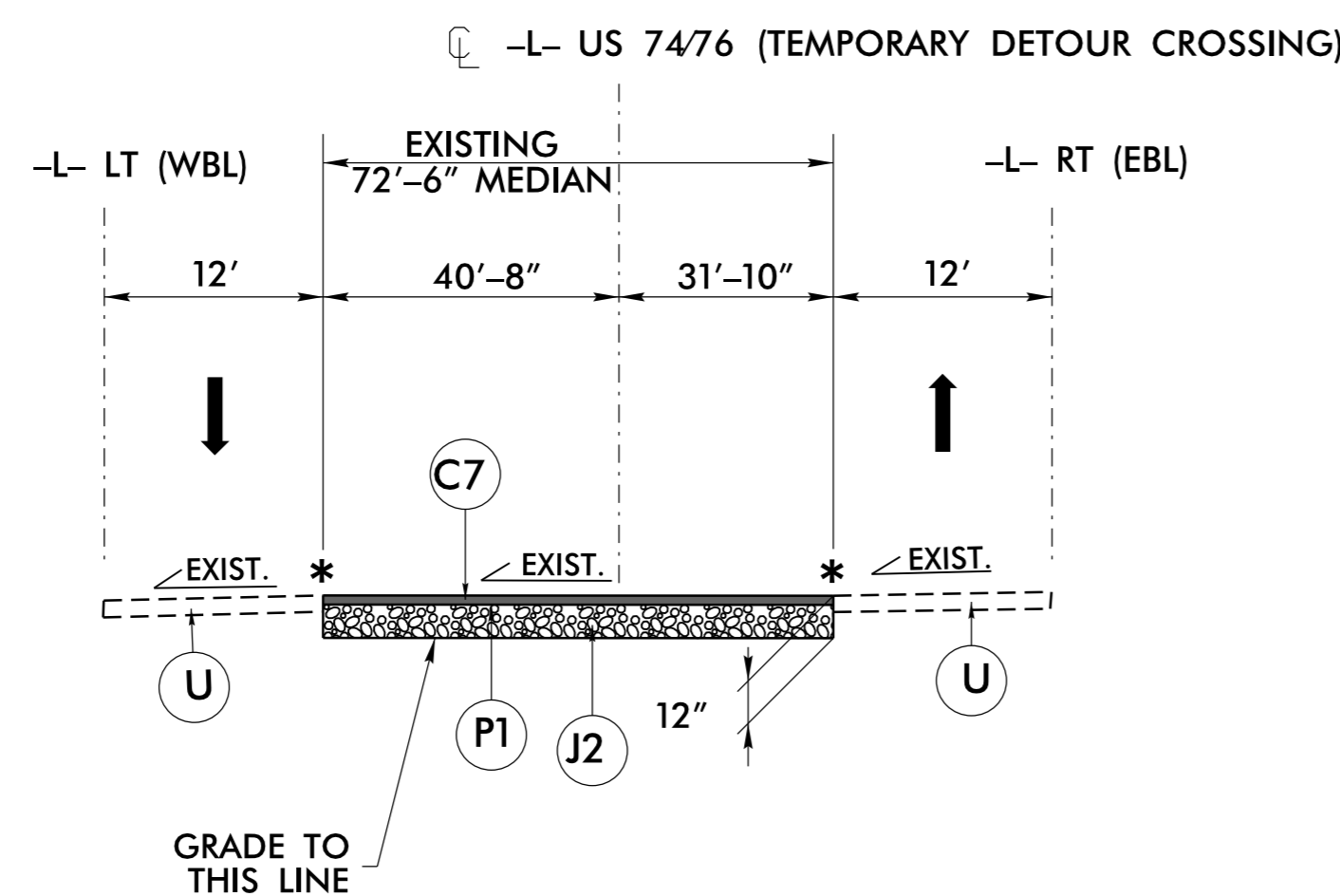
USE TYPICAL SECTION NO. 9

-DET- STA. 12+25.00 TO STA. 20+80.72  
 -DET- STA. 22+25.48 TO STA. 30+66.50

- \* SEE CROSS SECTIONS FOR VARIABLE SLOPES

USE AGGREGATE SUBGRADE DETAIL IN CONJUNCTION WITH TYPICAL SECTION NO. 8

-DET- STA. 10+75.00 TO STA. 11+75.00  
 -DET- STA. 11+75.00 TO STA. 12+75.00

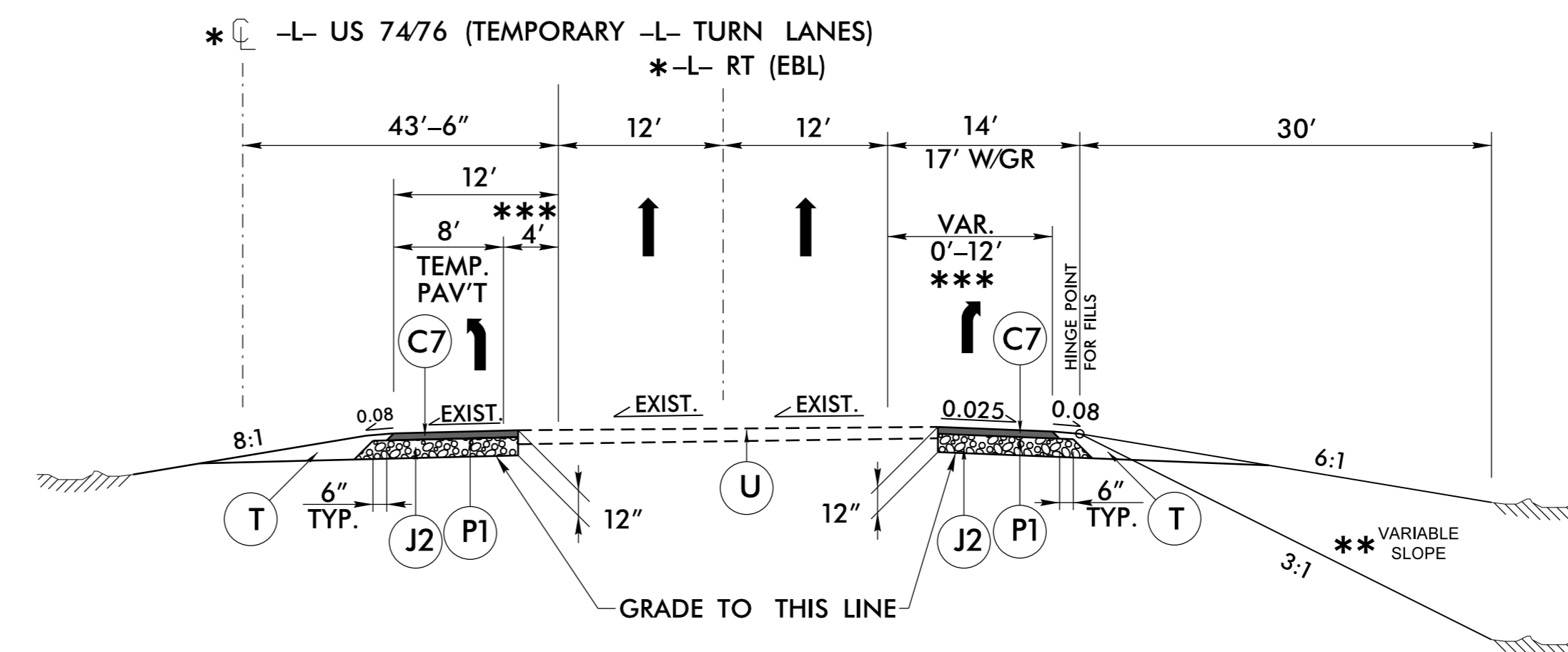


**TYPICAL SECTION NO. 10**

USE TYPICAL SECTION NO. 10

-L- LT STA. 48+13.14 TO STA. 49+81.68  
 -L- RT STA. 48+18.15 TO STA. 49+56.71

- \* TIE TO EXISTING EOP, PAVE TO DRAIN


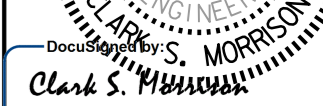
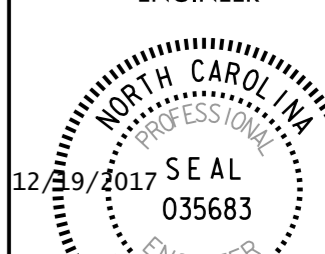
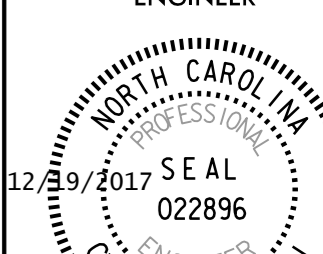

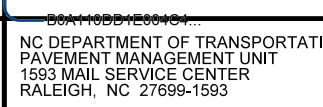


**TYPICAL SECTION NO. 11**

USE TYPICAL SECTION NO. 11

-L- RT STA. 45+43.17 TO STA. 49+90.21  
 -L- RT STA. 45+68.15 TO STA. 48+18.15  
 -L- LT STA. 47+77.68 TO STA. 50+96.64  
 -L- LT STA. 49+81.68 TO STA. 51+09.39

- \* MIRROR FOR -L- LT (WBL)
- \*\* SEE CROSS SECTIONS FOR VARIABLE SLOPES
- \*\*\* FUTURE FULL DEPTH PAVED SHOULDER

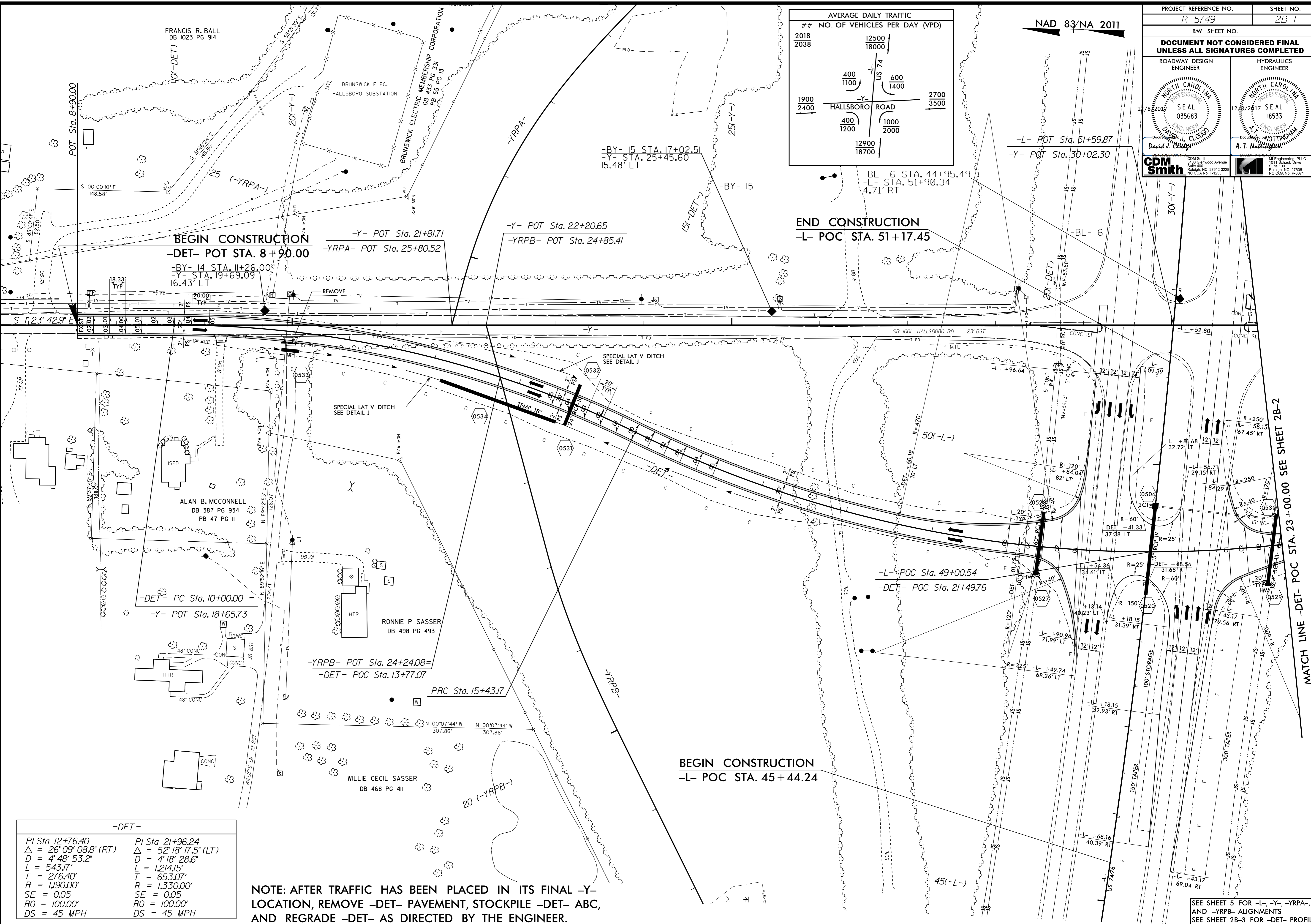
PROJECT REFERENCE NO. R-5749	SHEET NO. 2A-5
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
ROADWAY DESIGN ENGINEER 	PAVEMENT DESIGN ENGINEER 
	
 	

PAVEMENT SCHEDULE		
C1	3" S9.5C	J2 10" ABC
C2	1.5" S9.5C	L1 CLASS IV SUBGRADE STABILIZATION
C3	VAR. S9.5C	N1 GEOTEXTILE FOR SOIL STABILIZATION
C4	3" S9.5B	P1 .35 PRIME COAT
C5	VAR. S9.5B	R1 5" MONO. CONC. (K.I.)
C6	1.5" S9.5B	R2 SHOULDER BERM GUTTER (SBG)
C7	2" S9.5B	T EARTH MATERIAL
D1	4" I19.0C	U EXIST. PAVEMENT
D2	VAR. I19.0C	V INCIDENTAL MILLING
D3	2.5" I19.0B	W WEDGING
D4	VAR. I19.0B	W1 WEDGING
E1	4" B25.0C	W2 WEDGING
E2	VAR. B25.0C	Y MILLED RUMBLE STRIP
J1	8" ABC	PAVEMENT EDGESLOPES 1:1 UNLESS NOTED OTHERWISE

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PROJECT REFERENCE NO. R-5749	SHEET NO. 2B-1
RW SHEET NO.	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

AVERAGE DAILY TRAFFIC		NO. OF VEHICLES PER DAY (VPD)	
2018	12500	12500	18000
2038	18000	18000	27000
1900	2400	400	1100
2000	2700	600	1400
2100	3000	800	1700
2200	3300	1000	2000
2300	3600	1200	2300
2400	3900	1400	2600
2500	4200	1600	2900
2600	4500	1800	3200
2700	4800	2000	3500
2800	5100	2200	3800
2900	5400	2400	4100
3000	5700	2600	4400
3100	6000	2800	4700
3200	6300	3000	5000
3300	6600	3200	5300
3400	6900	3400	5600
3500	7200	3600	5900
3600	7500	3800	6200
3700	7800	4000	6500
3800	8100	4200	6800
3900	8400	4400	7100
4000	8700	4600	7400
4100	9000	4800	7700
4200	9300	5000	8000
4300	9600	5200	8300
4400	9900	5400	8600
4500	10200	5600	8900
4600	10500	5800	9200
4700	10800	6000	9500
4800	11100	6200	9800
4900	11400	6400	10100
5000	11700	6600	10400
5100	12000	6800	10700
5200	12300	7000	11000
5300	12600	7200	11300
5400	12900	7400	11600
5500	13200	7600	11900
5600	13500	7800	12200
5700	13800	8000	12500
5800	14100	8200	12800
5900	14400	8400	13100
6000	14700	8600	13400
6100	15000	8800	13700
6200	15300	9000	14000
6300	15600	9200	14300
6400	15900	9400	14600
6500	16200	9600	14900
6600	16500	9800	15200
6700	16800	10000	15500
6800	17100	10200	15800
6900	17400	10400	16100
7000	17700	10600	16400
7100	18000	10800	16700
7200	18300	11000	17000
7300	18600	11200	17300
7400	18900	11400	17600
7500	19200	11600	17900
7600	19500	11800	18200
7700	19800	12000	18500
7800	20100	12200	18800
7900	20400	12400	19100
8000	20700	12600	19400
8100	21000	12800	19700
8200	21300	13000	20000
8300	21600	13200	20300
8400	21900	13400	20600
8500	22200	13600	20900
8600	22500	13800	21200
8700	22800	14000	21500
8800	23100	14200	21800
8900	23400	14400	22100
9000	23700	14600	22400
9100	24000	14800	22700
9200	24300	15000	23000
9300	24600	15200	23300
9400	24900	15400	23600
9500	25200	15600	23900
9600	25500	15800	24200
9700	25800	16000	24500
9800	26100	16200	24800
9900	26400	16400	25100
10000	26700	16600	25400




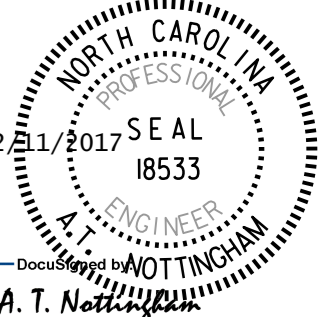

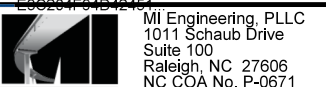
-DET-	
PI Sta 12+76.40	PI Sta 21+96.24
$\Delta = 26^{\circ} 09' 08.8" (RT)$	$\Delta = 52^{\circ} 18' 17.5" (LT)$
$D = 4' 48" 53.2"$	$D = 4' 18" 28.6"$
$L = 543.17'$	$L = 1,214.15'$
$T = 276.40'$	$T = 653.07'$
$R = 1,190.00'$	$R = 1,330.00'$
$SE = 0.05$	$SE = 0.05$
$RO = 100.00'$	$RO = 100.00'$
$DS = 45 MPH$	$DS = 45 MPH$

NOTE: AFTER TRAFFIC HAS BEEN PLACED IN ITS FINAL -Y- LOCATION, REMOVE -DET- PAVEMENT, STOCKPILE -DET- ABC, AND REGRADE -DET- AS DIRECTED BY THE ENGINEER.

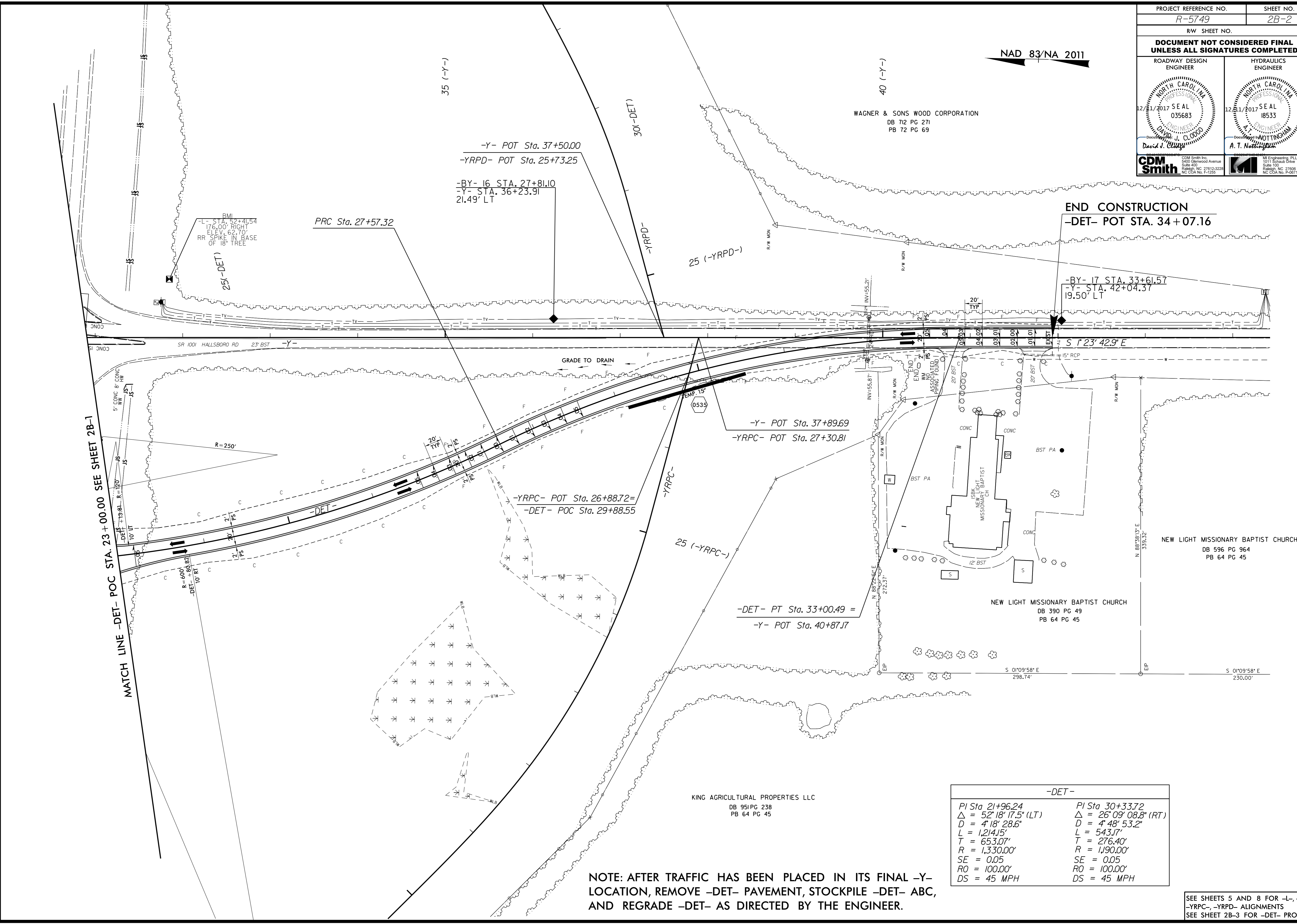
MATCH LINE -DET- POC STA. 23 + 00.00 SEE SHEET 2B-2

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SEE SHEET 5 FOR -L-, -Y-, -YRPA-, AND -YRPB- ALIGNMENTS  
SEE SHEET 2B-3 FOR -DET- PROFILE

PROJECT REFERENCE NO. <i>R-5749</i>	SHEET NO. <i>2B-2</i>
R/W SHEET NO.	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER 
 CDM Smith Inc. 5400 Glenwood Avenue Suite 400 Raleigh, NC 27612-3228 NC CDA No. P-1255	 M.E. Engineering, PLLC 3115 Schuch Drive Suite 100 Raleigh, NC 27608 NC CDA No. P-0871

NAD 83/NA 2011



MATCH LINE -DET- POC STA. 23+00.00 SEE SHEET 2B-1

END CONSTRUCTION  
-DET- POT STA. 34+07.16

-BY- 17 STA. 33+61.57  
-Y- STA. 42+04.37  
19.50' LT

-Y- POT Sta. 37+50.00  
-YRPD- POT Sta. 25+73.25  
-BY- 16 STA. 27+81.10  
-Y- STA. 36+23.91  
21.49' LT

WAGNER & SONS WOOD CORPORATION  
DB 712 PG 271  
PB 72 PG 69

-Y- POT Sta. 37+89.69  
-YRPC- POT Sta. 27+30.81

-YRPC- POT Sta. 26+88.72=  
-DET- POC Sta. 29+88.55

-DET- PT Sta. 33+00.49 =  
-Y- POT Sta. 40+87.17

NEW LIGHT MISSIONARY BAPTIST CHURCH  
DB 596 PG 964  
PB 64 PG 45

NEW LIGHT MISSIONARY BAPTIST CHURCH  
DB 390 PG 49  
PB 64 PG 45

KING AGRICULTURAL PROPERTIES LLC  
DB 951 PG 238  
PB 64 PG 45

-DET-	
PI Sta. 21+96.24	PI Sta. 30+33.72
$\Delta = 52' 18" 17.5" (LT)$	$\Delta = 26' 09" 08.8" (RT)$
$D = 4' 18" 28.6"$	$D = 4' 48" 53.2"$
$L = 1,214.15'$	$L = 543.17'$
$T = 653.07'$	$T = 276.40'$
$R = 1,330.00'$	$R = 1,190.00'$
$SE = 0.05$	$SE = 0.05$
$RO = 100.00'$	$RO = 100.00'$
$DS = 45 MPH$	$DS = 45 MPH$

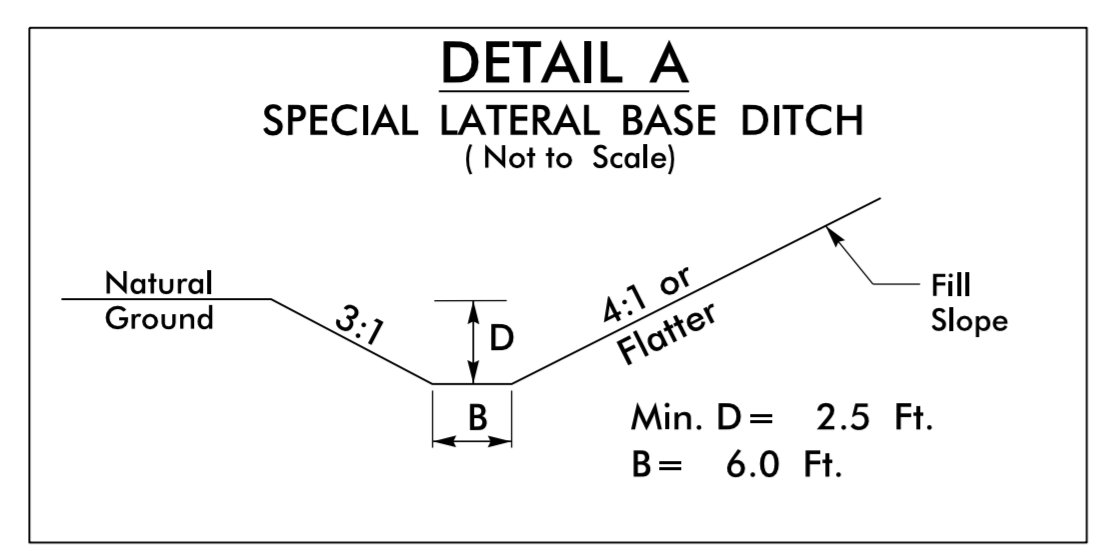
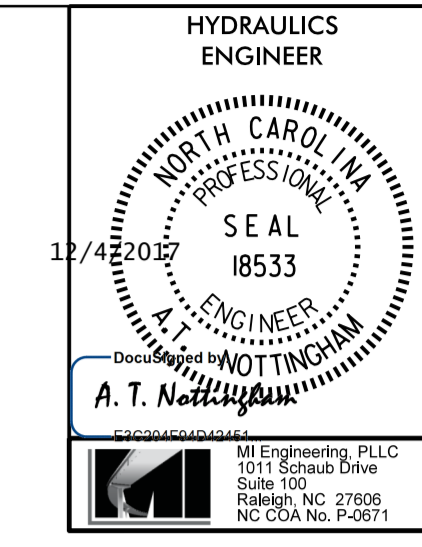
NOTE: AFTER TRAFFIC HAS BEEN PLACED IN ITS FINAL -Y- LOCATION, REMOVE -DET- PAVEMENT, STOCKPILE -DET- ABC, AND REGRADE -DET- AS DIRECTED BY THE ENGINEER.

SEE SHEETS 5 AND 8 FOR -L-, -Y-,  
-YRPC-, -YRPD- ALIGNMENTS  
SEE SHEET 2B-3 FOR -DET- PROFILE

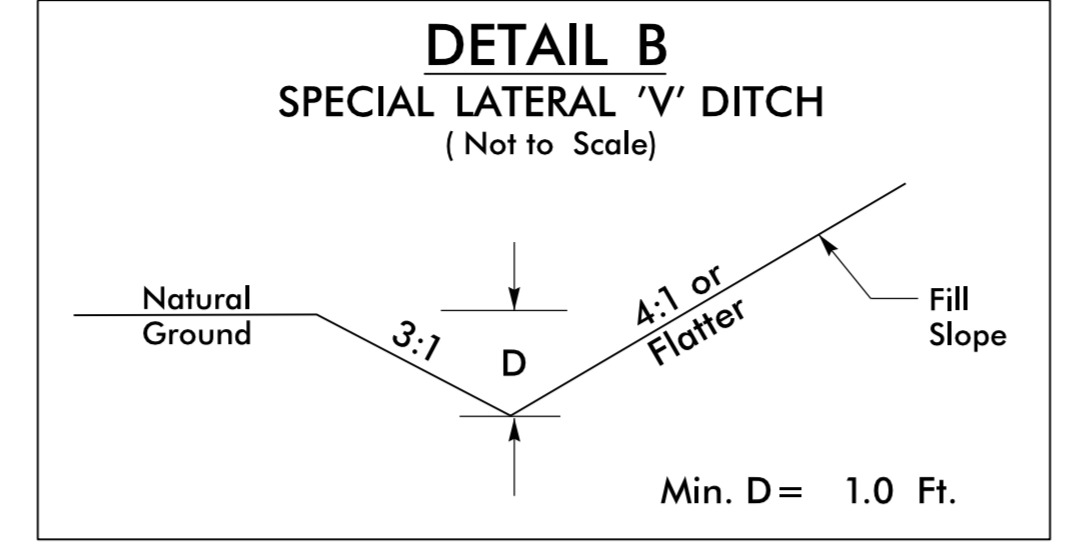
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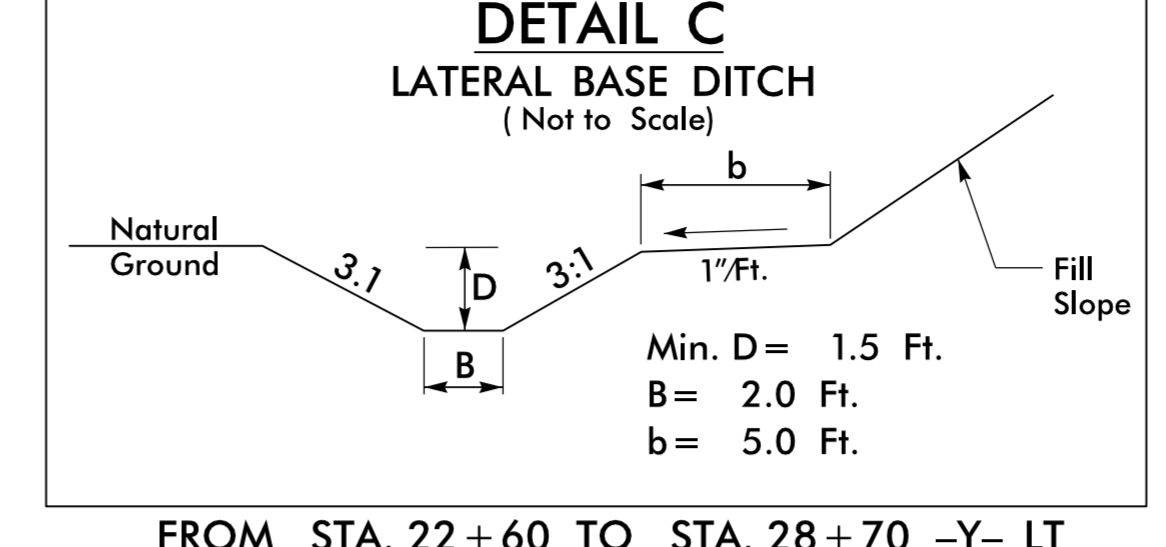




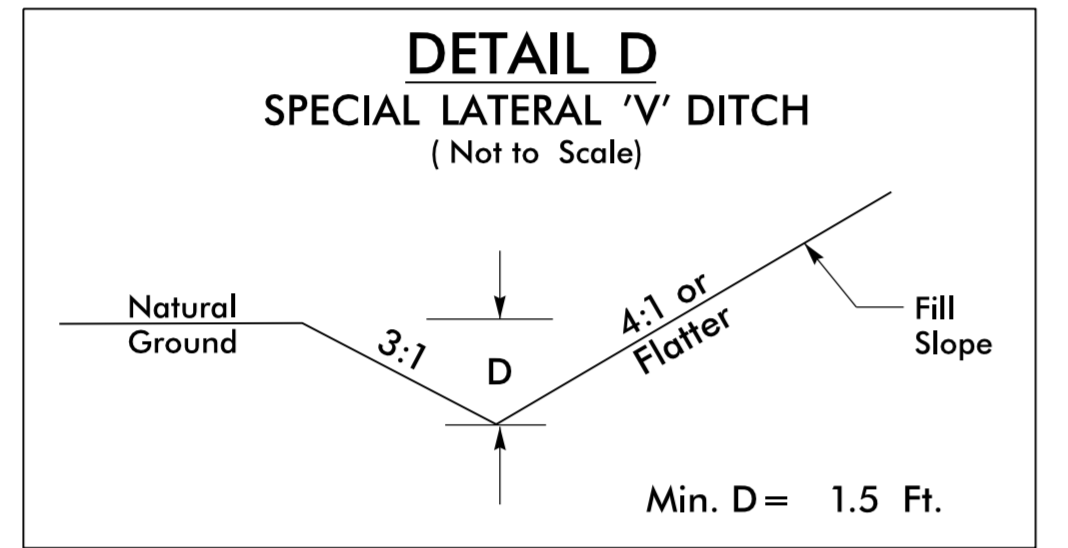
FROM STA. 32+50 -L-EBL RT TO STA. 11+50 -YRPC-RT  
 FROM STA. 35+50 -L-WBL- LT TO STA. 11+70 -YRPB- LT  
 FROM STA. 11+00 -YRPD- LT TO STA. 68+17 -L- EBL RT  
 FROM STA. 9+50 -YRPA- RT TO STA. 12+30 -YRPA- RT



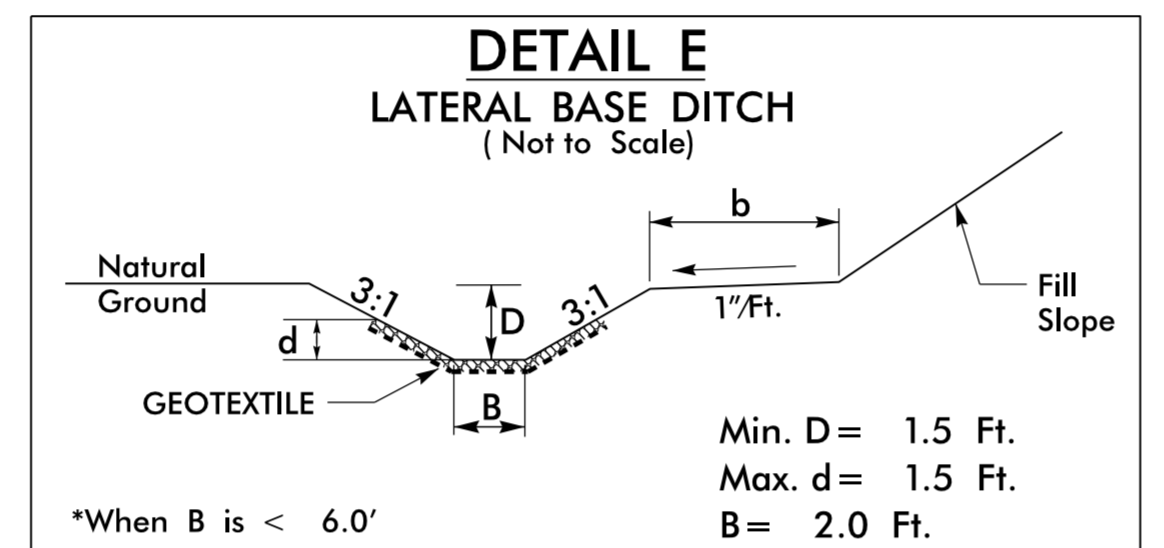
FROM STA. 23+50 TO STA. 25+30 -YRPA- RT  
 FROM STA. 24+00 TO STA. 25+00 -YRPA- LT  
 FROM STA. 13+16 TO STA. 20+00 -YRPA- LT  
 FROM STA. 12+70 TO STA. 15+00 -YRPB- RT  
 FROM STA. 14+00 TO STA. 17+50 -YRPC- LT



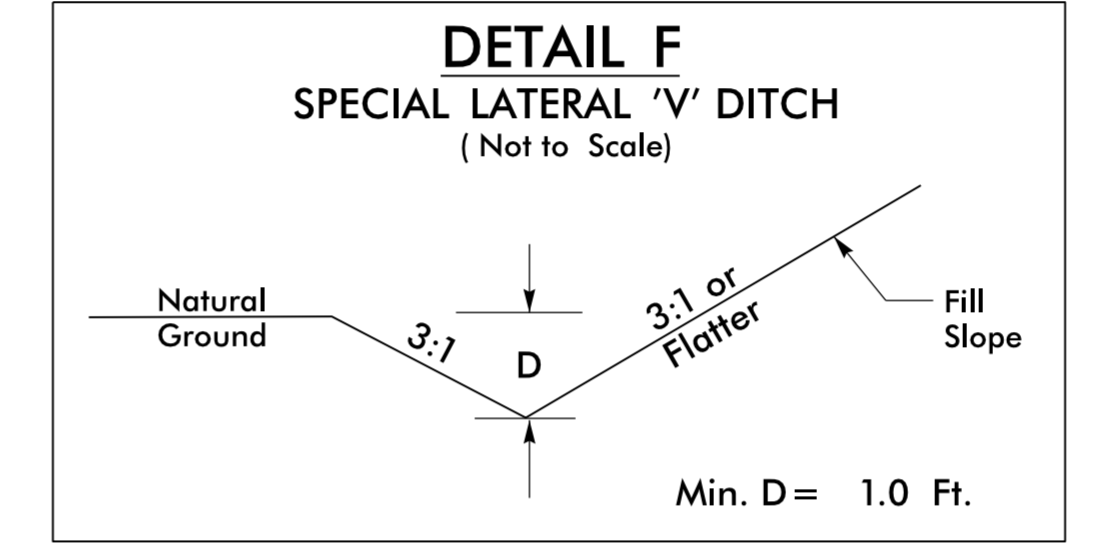
FROM STA. 22+60 TO STA. 28+70 -Y- LT  
 FROM STA. 31+75 TO STA. 36+85 -Y- LT  
 FROM STA. 31+50 TO STA. 37+20 -Y- RT  
 FROM STA. 22+92 TO STA. 28+50 -Y- RT



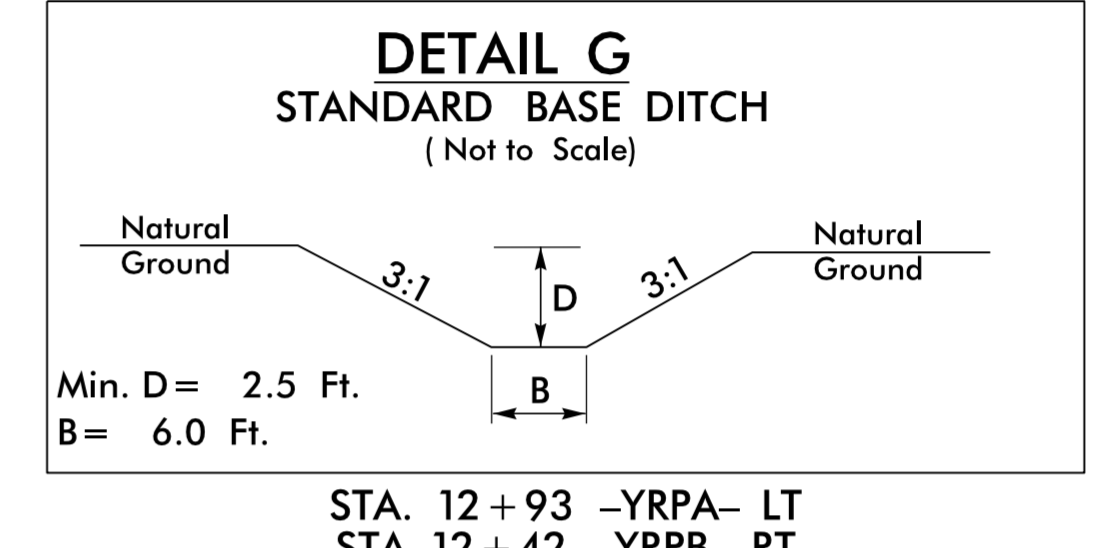
FROM STA. 12+75 TO STA. 24+80 -YRPD-RT  
 FROM STA. 21+50 TO STA. 25+30 -YRPD- LT



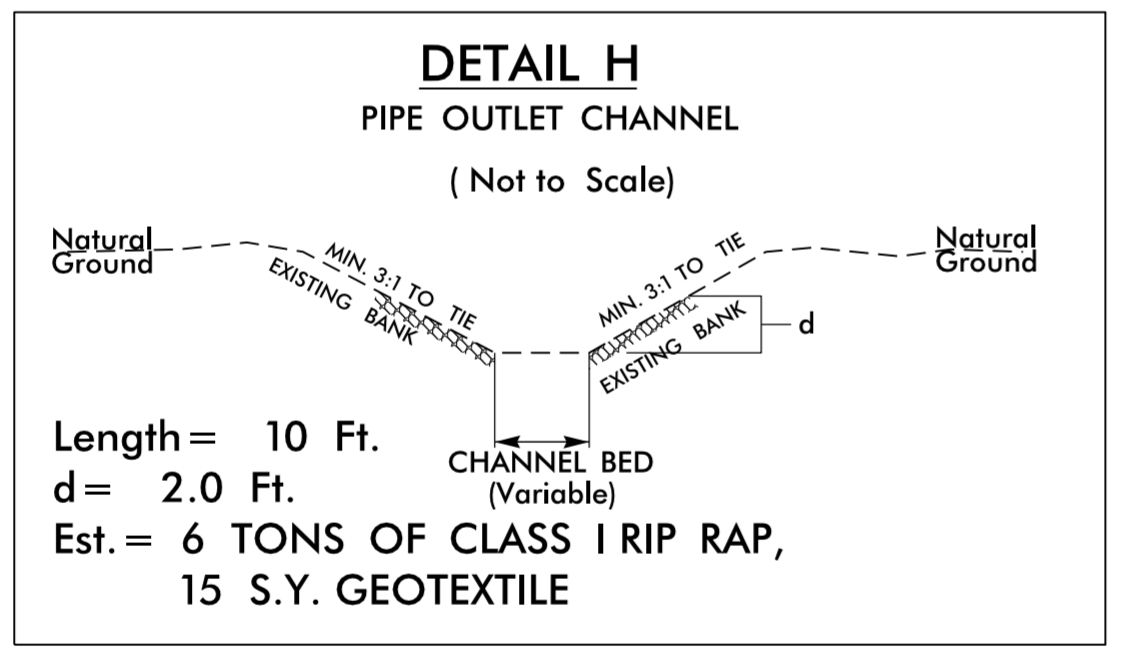
\*When B is < 6.0'  
 Type of Liner = CLASS I Rip-Rap  
 FROM STA. 28+70 TO STA. 28+80 -Y- LT  
 FROM STA. 31+48 TO STA. 31+75 -Y- LT  
 FROM STA. 31+34 TO STA. 31+50 -Y- RT  
 FROM STA. 28+50 TO STA. 28+62 -Y- RT



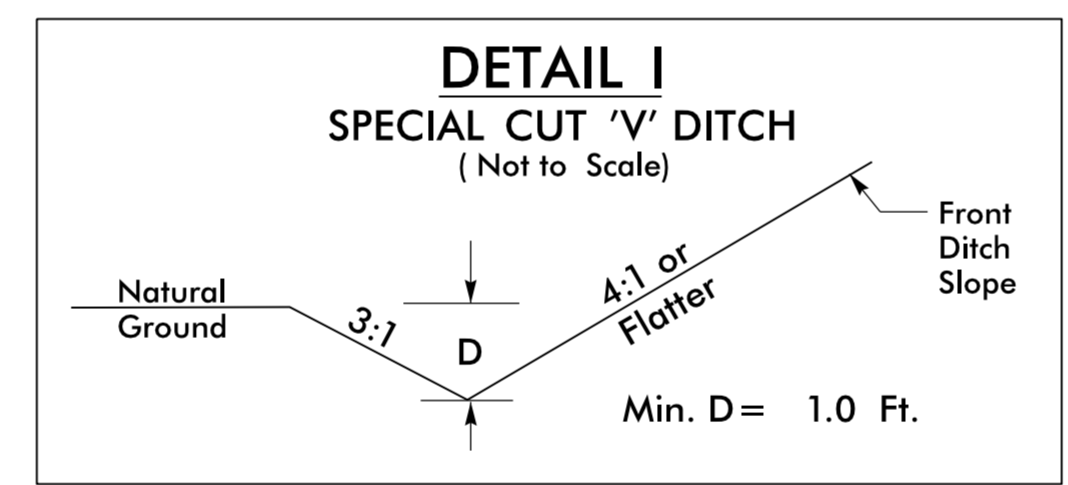
FROM STA. 19+00 TO STA. 21+38 -Y- LT  
 FROM STA. 38+10 TO STA. 38+50 -Y- LT  
 FROM STA. 41+00 TO STA. 42+00 -Y- RT  
 FROM STA. 18+00 TO STA. 21+45 -Y- RT



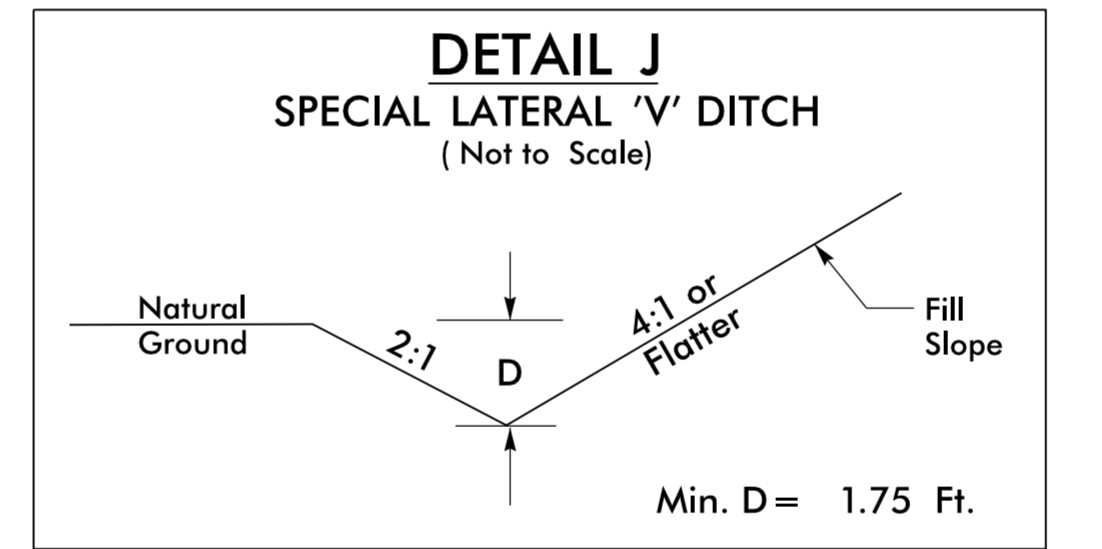
STA. 12+93 -YRPA- LT  
 STA. 12+42 -YRPB- RT



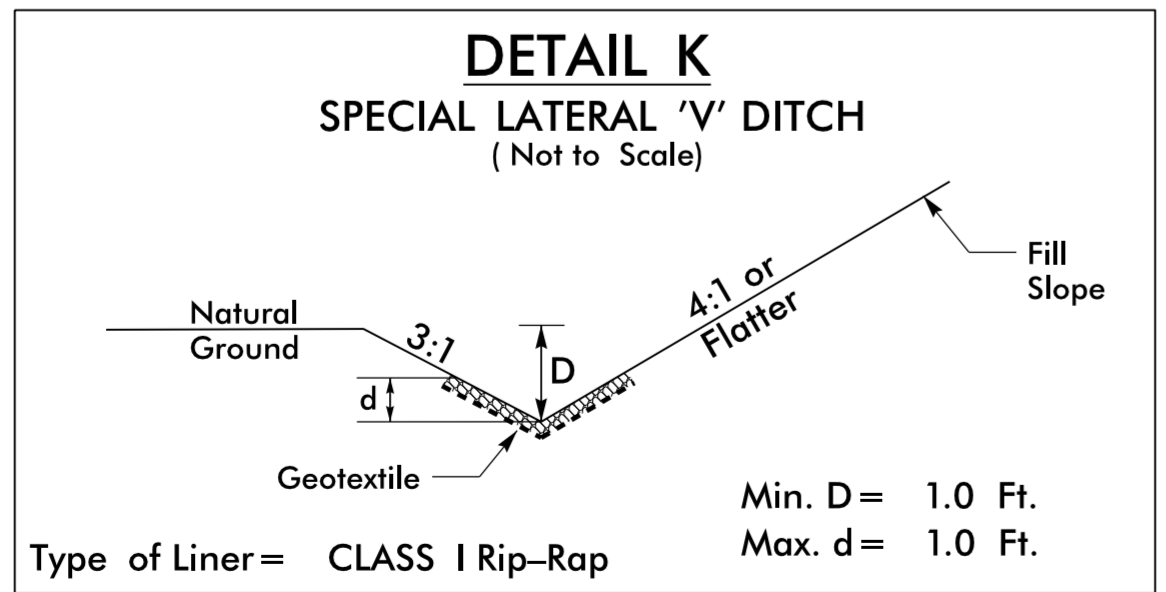
STA. 28+82 -Y- LT  
 STA. 31+44 -Y- LT  
 STA. 12+25 -YRPA- RT  
 STA. 12+42 -YRPB- RT  
 STA. 13+55 -YRPC- LT  
 STA. 11+13 -YRPD- LT



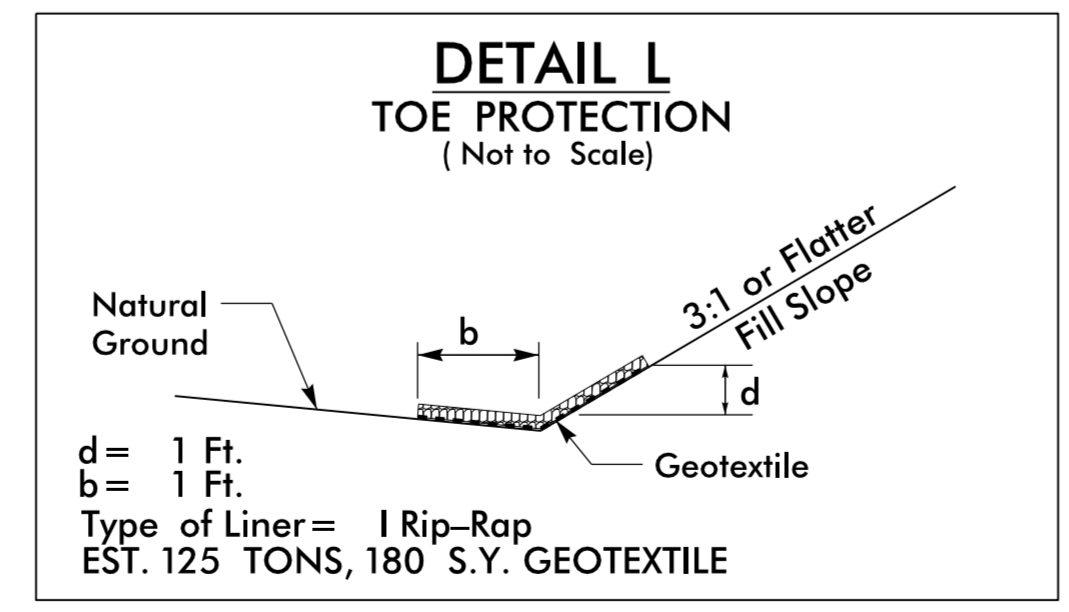
FROM STA. 19+01 TO STA. 19+50 -YRPB- LT  
 FROM STA. 19+50 TO STA. 24+00 -YRPB- RT  
 FROM STA. 24+50 TO STA. 26+50 -YRPC- LT  
 FROM STA. 11+50 TO STA. 21+50 -YRPD- LT



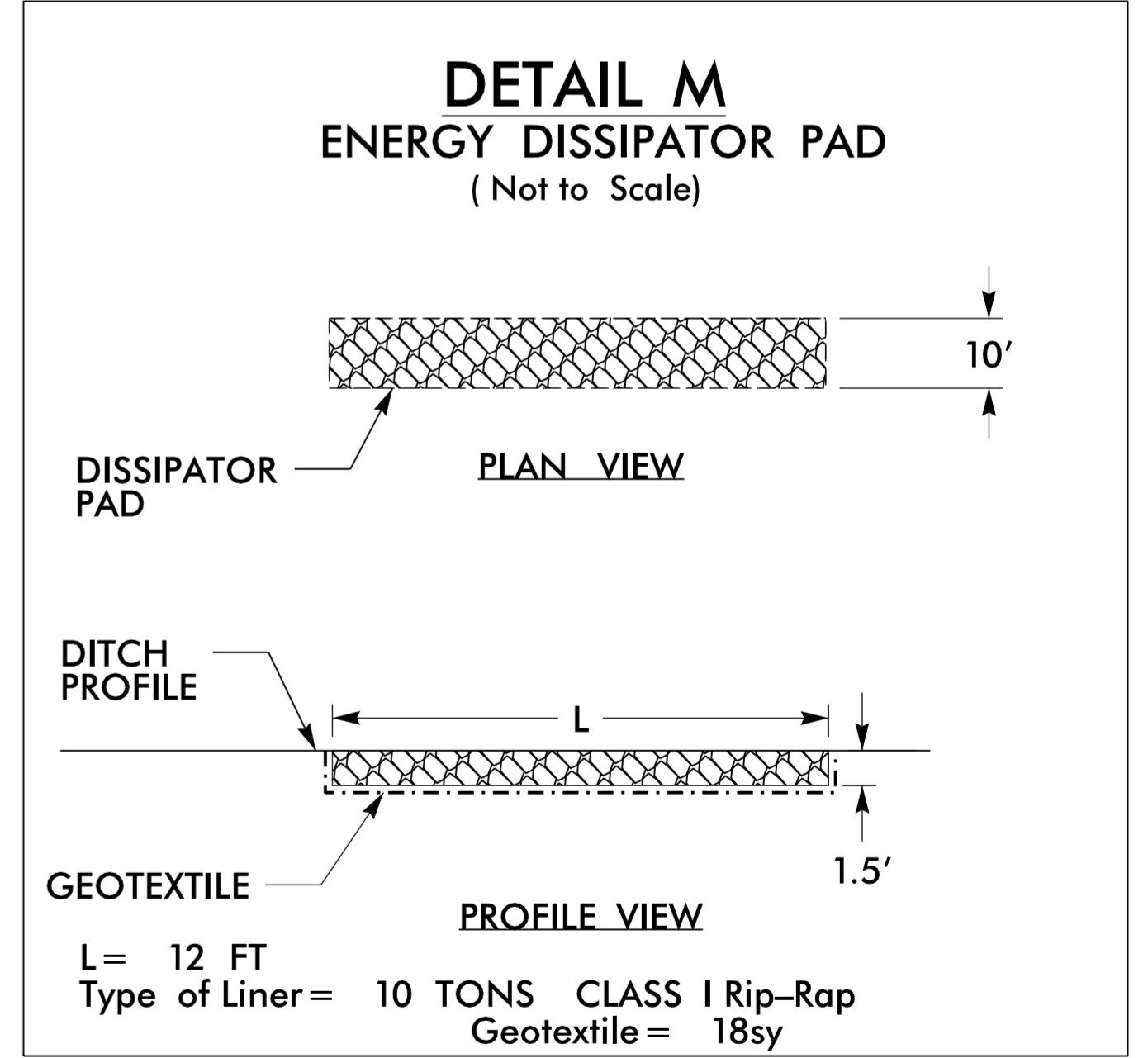
FROM STA. 11+00 TO STA. 17+00 -DET- RT  
 FROM STA. 13+50 TO STA. 14+65 -DET- LT



FROM STA. 12+50 TO STA. 12+75 -YRPD- RT



FROM STA. 65+68 TO STA. 69+50 -L- LT



FROM STA. 9+38 TO STA. 9+50 -YRPA- RT

REVISIONS

8/17/99

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**SUMMARY OF EARTHWORK**  
 (IN CUBIC YARDS)

STATION	STATION	UNCL. EXCAV.	UNDERCUT	EMBANK. +%	BORROW	WASTE
-DET- 8+90.00	20+80.72	2,416	2,369	3,943	1,547	2,389
-DET- 21+05.46	21+85.49			143	143	
-DET- 22+25.48	34+07.16	2,044	1,864	3,813	1,769	1,864
SUBTOTALS:		4,460	4,233	7,897	3,457	4,253
-YRPA- 9+42.95	25+61.88	3,156	2,594	11,030	8,232	2,952
-YRPB- 9+35.21	24+66.78	1,911	2,095	9,684	9,158	3,480
-YRPC- 9+75.36	27+12.17	2,525	1,464	14,784	13,412	2,617
-YRPD- 9+75.97	25+51.95	8,142	2,291	7,948	9	2,494
SUBTOTALS:		15,734	8,444	43,445	30,810	11,543
-Y- 17+55.00	28+91.30	428	83	42,248	41,836	99
-Y- 31+13.30	42+00.00	106		44,900	44,794	
SUBTOTALS:		534	83	87,147	86,629	99
-L-LT 20+00.00	50+00.00	1,401		3,345	1,944	
-L-LT 50+00.00	72+81.00	974		4,096	3,122	
-L-RT 28+00.00	58+00.00	1,662		6,885	5,223	
-L-RT 58+00.00	83+14.00	1,197		2,350	1,153	
SUBTOTALS:		5,234		16,676	11,442	
DETOUR REMOVAL						
-DET- 8+90.00	20+80.72	785		3,020	2,235	
-DET- 21+05.46	21+85.49	114				114
-DET- 22+25.48	34+07.16	1,186		2,555	1,369	
SUBTOTALS:		2,085		5,575	3,604	114
TOTALS:		28,047	12,760	160,740	135,942	16,009
MATERIAL FOR SHOULDER CONSTRUCTION				13,125	13,125	
LOSS DUE TO CLEARING AND GRUBBING		-1,125			1,125	
WASTE IN LIEU OF BORROW					-114	-114
SELECT GRANULAR MATERIAL IN LIEU OF BORROW				-19,188	-19,188	
ADDITIONAL UNDERCUT (CONTINGENCY)			3,100	3,875	3,875	3,100
PROJECT TOTALS:		26,922	15,860	158,553	134,766	18,995
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT					6,737	
GRAND TOTALS:		26,922	15,860	158,553	141,504	18,995
SAY:		27,000	15,900	141,600		
UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE IN THE TOP 3' OF EMBANKMENT OR BACKFILL: -Y- 19+75 TO 20+25 (5 CY), -YRPA- 11+25 TO 13+25 (50 CY), -YRPA- 17+25 TO 20+25 (50 CY), -YRPA- 23+25 TO 25+25 (25 CY), -YRPB- 13+25 TO 16+25 (75 CY), -YRPB- 18+25 TO 21+25 (25 CY), -YRPC- 13+75 TO 15+75 (25 CY), -YRPC- 24+25 TO 26+75 (75 CY), -YRPD- 8+75 TO 14+25 (575 CY), -YRPD- 16+25 TO 21+25 (50 CY), -DET- 15+75 TO 20+25 (1,350 CY), -DET- 23+25 TO 26+75 (1,750 CY), -DET- 27+75 TO 28+25 (10 CY), -DET- 28+75 TO 29+25 (25 CY), CONTINGENCY (820 CY) PER GEOTECH						
EST. DDE = 11,800 CY						
TOTAL SHALLOW UNDERCUT = 2,250 CY						
TOTAL CLASS IV SUBGRADE STABILIZATION = 4,340 TON						
TOTAL SELECT GRANULAR MATERIAL = 15,850 CY						

Earthwork quantities are calculated by NCDOT Division 6. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

**NOTE: AFTER TRAFFIC HAS BEEN PLACED IN ITS FINAL -Y- LOCATION, REMOVE -DET- PAVEMENT, STOCKPILE -DET- ABC, AND REGRADE -DET- AS DIRECTED BY THE ENGINEER.**

**SUMMARY OF PAVEMENT REMOVAL**

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD <sup>2</sup>
-L-	49+92.14	51+40.16	CL	176.48
-L-	51+79.57	53+51.04	CL	107.67
-DET-	10+98.00	20+69.97	CL	2,756.37
-DET-	21+10.07	21+89.58	CL	1,008.51
-DET-	22+30.08	32+00.58	CL	2,638.17
TOTAL:				6,687.20
SAY:				6,690.00

**SUMMARY OF BREAKING EXISTING ASPHALT PAVEMENT**

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD <sup>2</sup>
-Y-	21+00.00	28+77.13	CL	2044.68
-Y-	31+27.46	39+00.00	CL	2094.30
TOTAL:				4138.98
SAY:				4200.00

**SUMMARY OF SHOULDER BERM GUTTER**

SURVEY LINE	STATION	STATION	LENGTH
-L- RT	71+42.97	73+55.47	212.50
-Y- LT	28+56.21	28+78.71	22.50
-Y- RT	27+28.32	28+75.76	147.44
-Y- LT	31+28.83	32+76.27	147.44
-Y- RT	31+25.89	31+48.38	22.29
TOTAL:			552.17
SAY:			553.00

**SUMMARY OF WOVEN WIRE FENCE**

STATION TO STATION	SIDE	A FABRIC LF.	B END BRACE	C CORNER BRACE	D LINE BRACE	E 4" POSTS	F 5" POSTS
-L- STA 20+00.00 TO STA 32+14.89	LT	1,214.89	1		4	79	14
-YRPB- STA 5+00.00 TO STA 23+62.07	LT	1,862.07		3	6	118	27
-L- STA 28+00.00 TO STA 32+30.00	RT	430.00	1		2	26	8
-YRPC- STA 5+00.00 TO STA 25+97.77	RT	2,097.77		3	7	133	30
-YRPA- STA 5+00.00 TO STA 24+62.32	RT	1,962.32		2	7	125	27
-L- STA 70+00.00 TO STA 71+25.00	LT	125.00	1		1	6	5
-YRPD- STA 5+00.00 TO STA 24+81.99	LT	1,981.99		2	7	127	27
-L- STA 71+13.15 TO STA 71+25.00	RT	11.85	1		1	-2	5
GRAND TOTALS:		9,685.89				614	143
SAY:		9,690				615	145
ADDITIONAL BARBED WIRE (CONTINGENCY)		500					

12/06/07

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12/06/07

COMPUTED BY:	AMC	DATE:	2/2/2017
CHECKED BY:	DJC	DATE:	2/2/2017

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
R-5749	36-1

**SUMMARY OF SUBSURFACE DRAINAGE**

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	DRAIN TYPE* UD/BD/SD	LF	
-L-	20+00.00	71+25.00	LT	SD	5,150	
-L-	20+00.00	82+14.00	CL	SD	6,250	
-L-	28+00.00	82+14.00	RT	SD	5,450	
-DET-	8+90.00	34+07.00	LT/RT	UD	5,050	
CONTINGENCY					SD	1,700
CONTINGENCY					UD	500
TOTAL:					24,100	
SAY:					24,100	

\*UD = UNDERDRAIN  
\*BD = BLIND DRAIN  
\*SD = SUBSURFACE DRAIN

**SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION**

SURVEY LINE	STATION	STATION	AGGREGATE TYPE ASU/AST	AGGREGATE THICKNESS INCHES	SHALLOW UNDERCUT CY	CLASS IV SUBGRADE STABILIZATION TONS	GEOTEXTILE FOR SOIL STABILIZATION SY	STABILIZER AGGREGATE TONS	CLASS IV AGGREGATE STABILIZATION TONS
-L-	26+25.00	27+75.00	ASU		90	170	270		
-L-	30+25.00	31+75.00	ASU		160	310	480		
-L-	34+25.00	36+75.00	ASU		410	790	1,230		
-L-	66+75.00	69+75.00	ASU		510	990	1,530		
-L-	72+25.00	83+14.00	ASU		430	840	1,290		
-Y-	19+75.00	20+25.00	ASU		10	10	30		
-DET-	10+75.00	11+75.00	ASU		10	10	10		
-DET-	11+75.00	12+75.00	ASU		50	100	150		
-Y-	40+25.00	41+75.00	ASU		20	40	60		
-Y-	17+75.00	19+25.00	ASU		40	80	120		
CONTINGENCY					520	1,000	1,550		
TOTAL:					2,250	4,340	6,720		
SAY:					2,250	4,340	6,720		

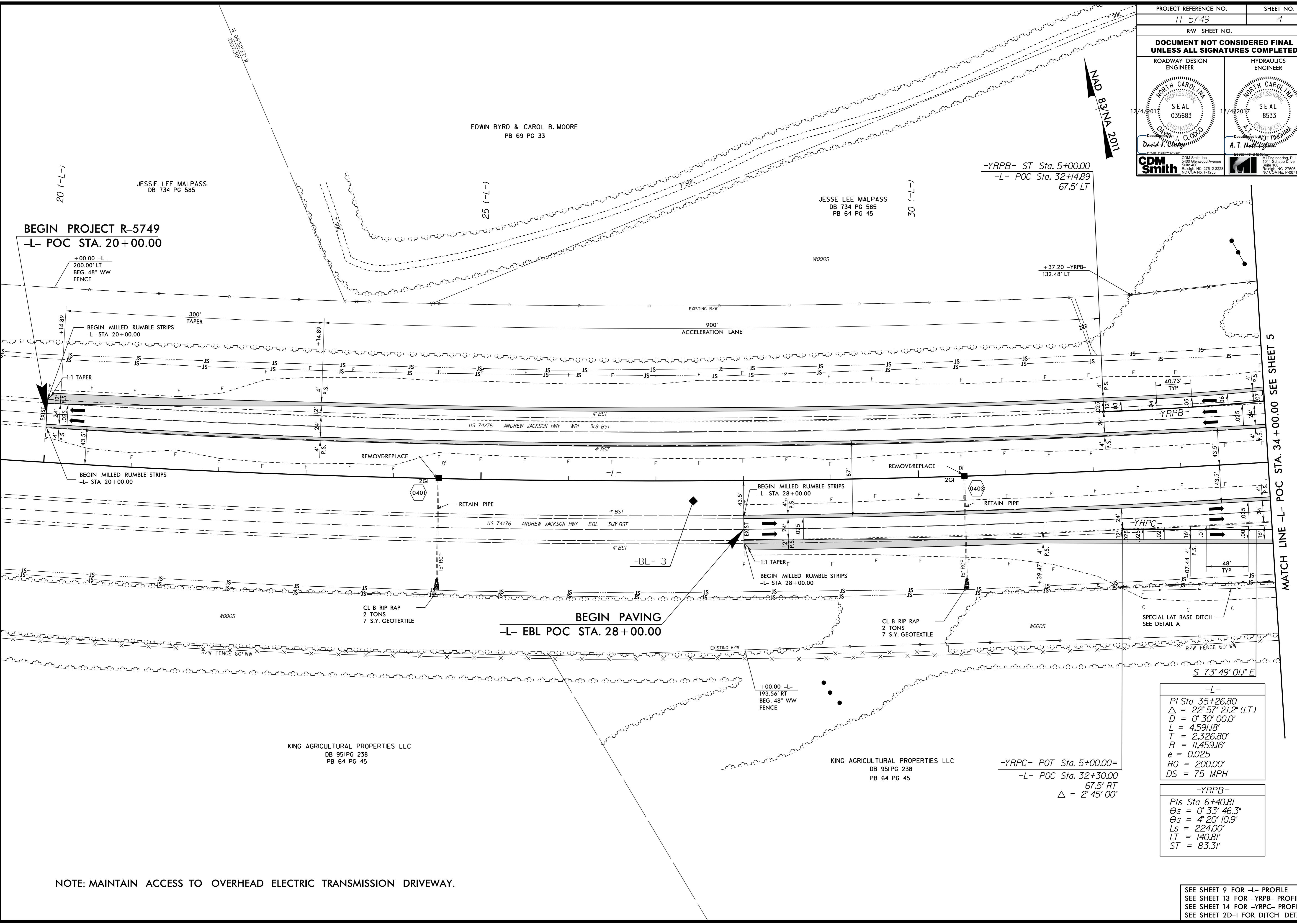
ASU = AGGREGATE SUBGRADE, AST = AGGREGATE STABILIZATION  
\*TOTAL SQUARE YARDS OF GEOTEXTILE FOR SOIL STABILIZATION IS ONLY THE ESTIMATED QUANTITY FOR ASU/AST AND MAY ONLY REPRESENT A PORTION OF THE GEOTEXTILE QUANTITY SHOWN IN THE ITEM SHEETS OF THE PROPOSAL.

**SUMMARY OF BRIDGE WAITING PERIODS**

BRIDGE OVER US 7476 ON SR 1001 AND NC 214	END BENT NO.	MONTHS
AFTER CONSTRUCTION TO WITHIN 2 FT OF FINISHED GRADE, WAIT BEFORE BEGINNING END BENT CONSTRUCTION	1	2
AFTER CONSTRUCTION TO WITHIN 2 FT OF FINISHED GRADE, WAIT BEFORE BEGINNING END BENT CONSTRUCTION	2	2

inv\ajd\_gxp\project\07\_11\120607\07\_11\120607\_361.dgn

PROJECT REFERENCE NO. R-5749	SHEET NO. 4
R/W SHEET NO.	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 035683 DAVID J. CLODD	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18533 A. T. NOTTINGHAM
CDM Smith 3100 Smith Inc. 5400 Glenwood Avenue Suite 400 Raleigh, NC 27612-3228 NC CDA No. P-1255	M Engineering, PLLC 3333 S. Shiloh Drive Raleigh, NC 27606 NC CDA No. P-3871



<p>-L- PI Sta 35+26.80 Δ = 22° 57' 21.2" (LT) D = 0' 30' 00.0" L = 4.59118' T = 2,326.80' R = 11,459.16' e = 0.025 RO = 200.00' DS = 75 MPH</p>
<p>-YRPB- PIs Sta 6+40.81 θs = 0° 33' 46.3" θs = 4° 20' 10.9" Ls = 224.00' LT = 140.81' ST = 83.31'</p>

NOTE: MAINTAIN ACCESS TO OVERHEAD ELECTRIC TRANSMISSION DRIVEWAY.

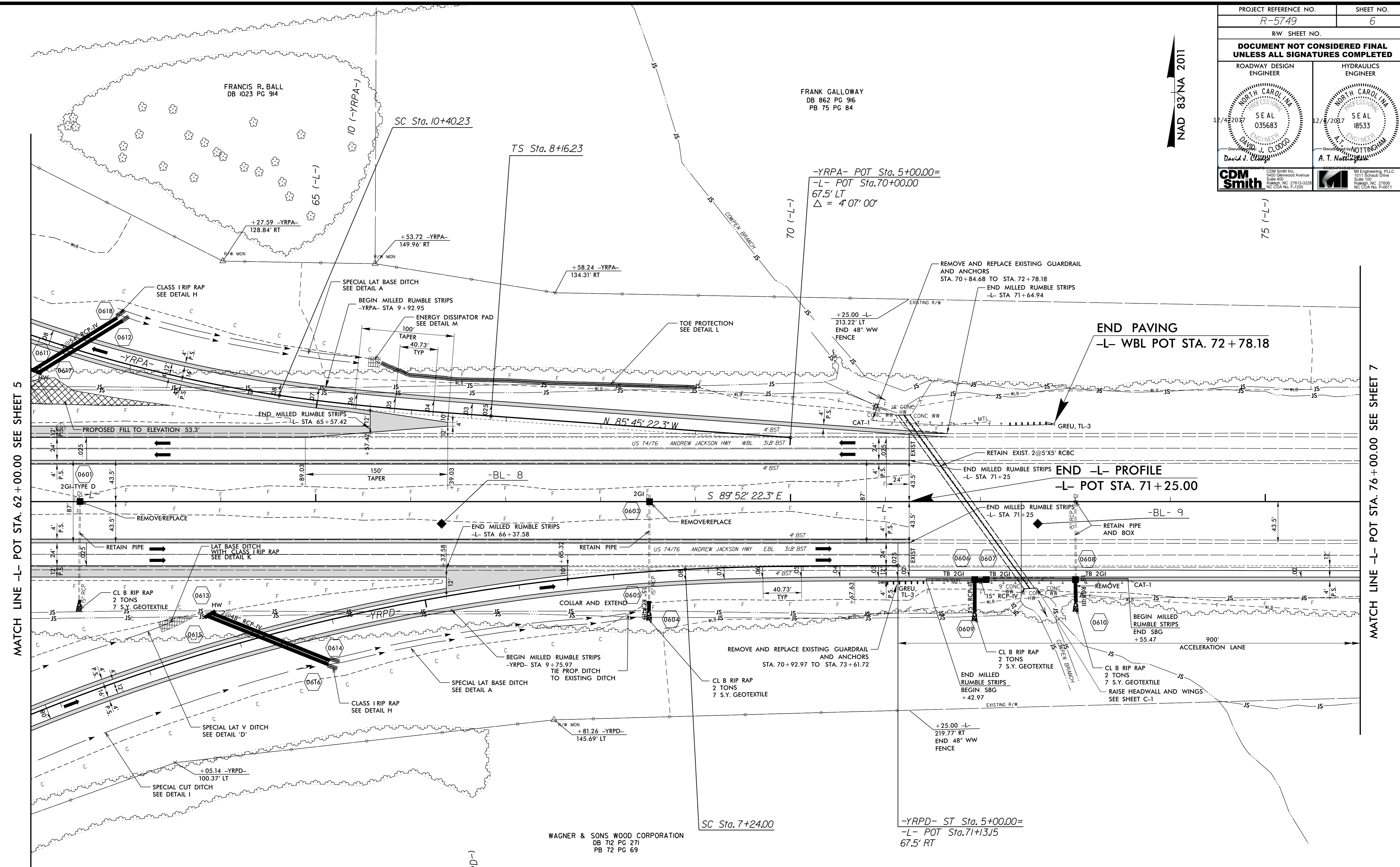
SEE SHEET 9 FOR -L- PROFILE  
SEE SHEET 13 FOR -YRPB- PROFILE  
SEE SHEET 14 FOR -YRPC- PROFILE  
SEE SHEET 2D-1 FOR DITCH DETAILS

Invalid expression: Rdj\_psh\_04.dgn  
USER: JTK/ER/11/11/2011



PROJECT REFERENCE NO. R-5749	SHEET NO. 6
R/W SHEET NO.	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
ROADWAY DESIGN ENGINEER DAVID J. CLODDO SEAL 035683 NORTH CAROLINA PROFESSIONAL ENGINEER 12/2/2017	HYDRAULICS ENGINEER A. T. NOTTINGHAM SEAL 18533 NORTH CAROLINA PROFESSIONAL ENGINEER 12/2/2017
CDM Smith 5400 Glenwood Avenue Raleigh, NC 27612-3228 NC CDA No. P-7255	

NAD 83/NA 2011



MATCH LINE -L- POT STA. 62 + 00.00 SEE SHEET 5

MATCH LINE -L- POT STA. 76 + 00.00 SEE SHEET 7

-YRPA-	
PIs Sta 9+65.61	PI Sta 14+44.61
$\Theta_s = 4^\circ 20' 09.2''$	$\Delta = 30^\circ 33' 48.6''$ (RT)
Ls = 224.00'	D = 3' 52' 16.8"
LT = 149.38'	L = 789.48'
ST = 74.71'	T = 404.38'
	R = 1,480.00'
	SE = 0.08
	RO = 224.00'
	DS = 65 MPH

-YRPD-	
PIs Sta 6+49.35	PI Sta 11+90.60
$\Theta_s = 3^\circ 00' 05.3''$	$\Delta = 24^\circ 37' 21.1''$ (LT)
Ls = 224.00'	D = 2' 40' 47.6"
LT = 149.35'	L = 918.79'
ST = 74.69'	T = 466.60'
	R = 2,138.00'
	SE = 0.08
	RO = 224.00'
	DS = 65 MPH

Invalid expression Rdj\_psh\_06.dgn  
USER: JTBK/ER/11/11/11

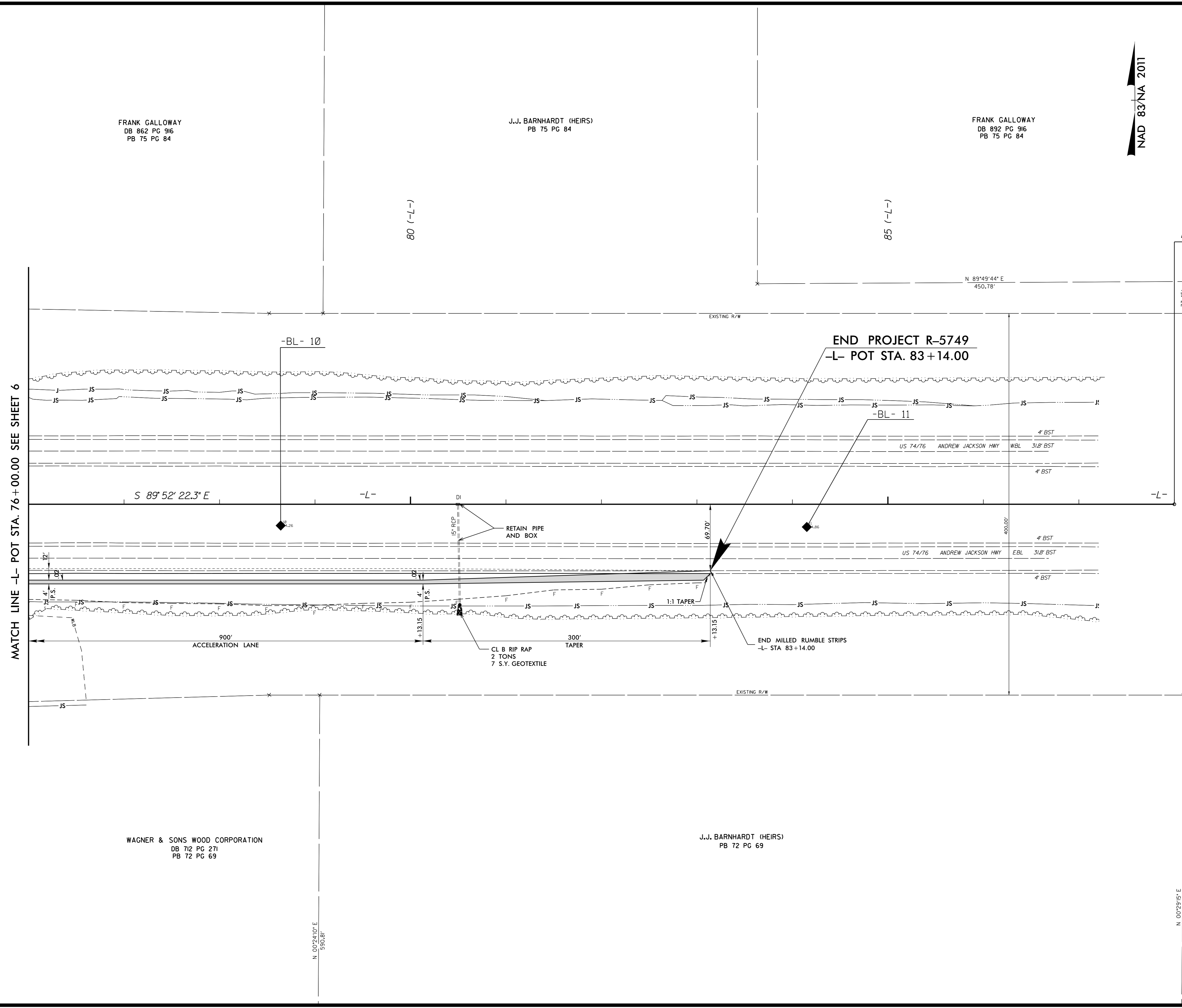
SEE SHEET 10 FOR -L- PROFILE  
SEE SHEET 12 FOR -YRPA- PROFILE  
SEE SHEET 15 FOR -YRPD- PROFILE  
SEE SHEET 2D-1 FOR DITCH DETAILS



5/14/99

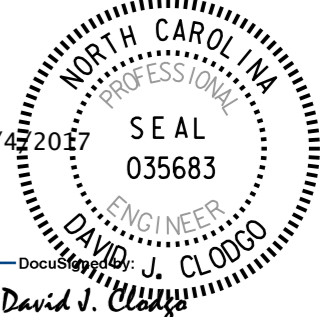
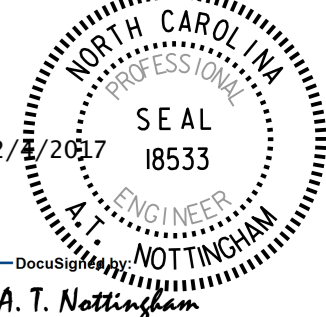

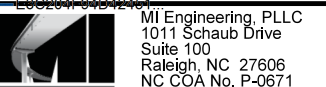
PROJECT REFERENCE NO. <i>R-5749</i>	SHEET NO. <i>7</i>
R/W SHEET NO.	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
ROADWAY DESIGN ENGINEER <i>David J. Clouse</i>	HYDRAULICS ENGINEER <i>A. T. Nottingham</i>
SEAL 035683	SEAL 18533
CDM Smith Inc. 5400 Glenwood Avenue Suite 400 Raleigh, NC 27612-3228 NC CDA No. P-1255	MJ Engineering, PLLC 3333 Schum Drive Suite 101 Raleigh, NC 27606 NC CDA No. P-3871

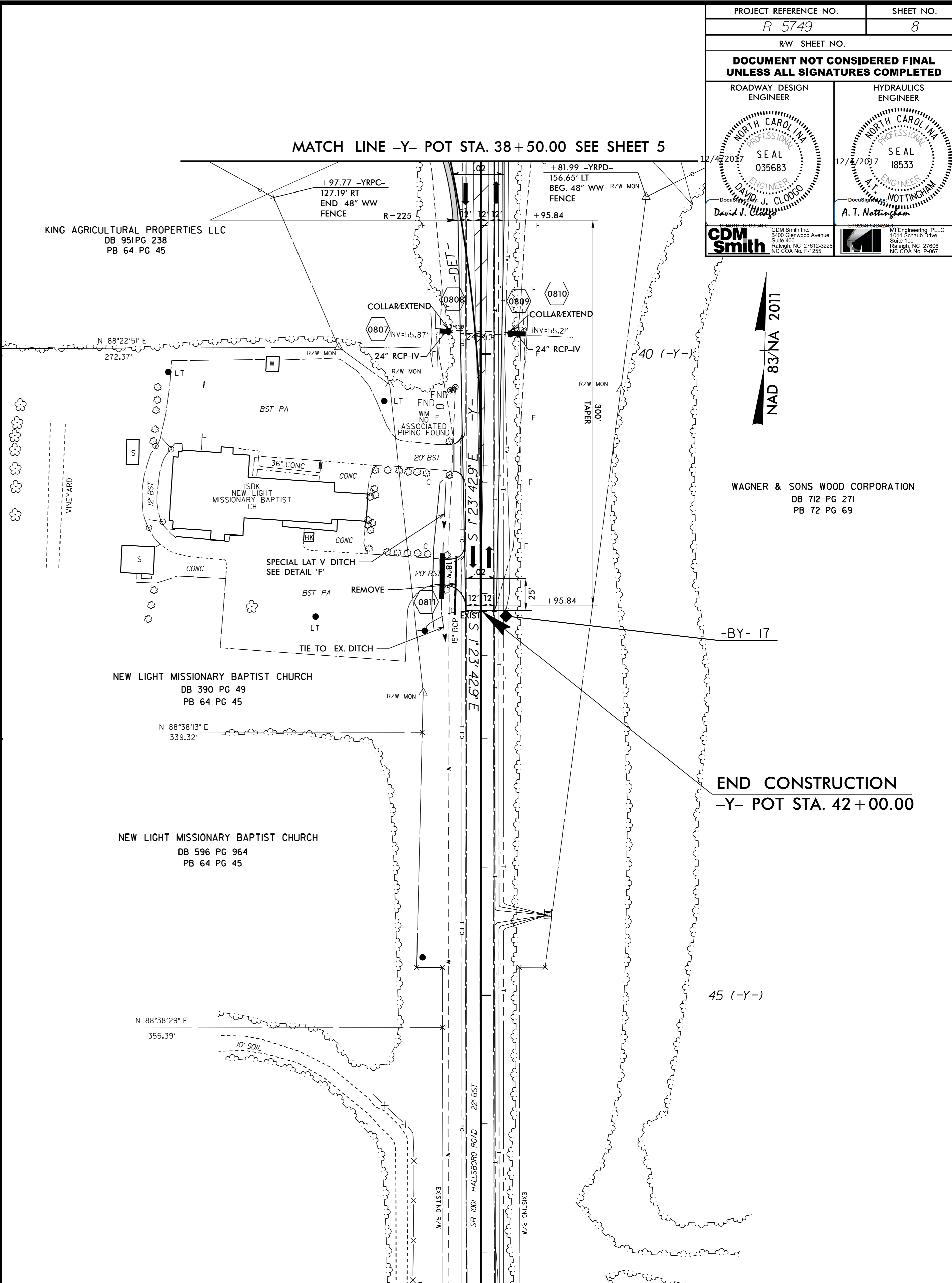
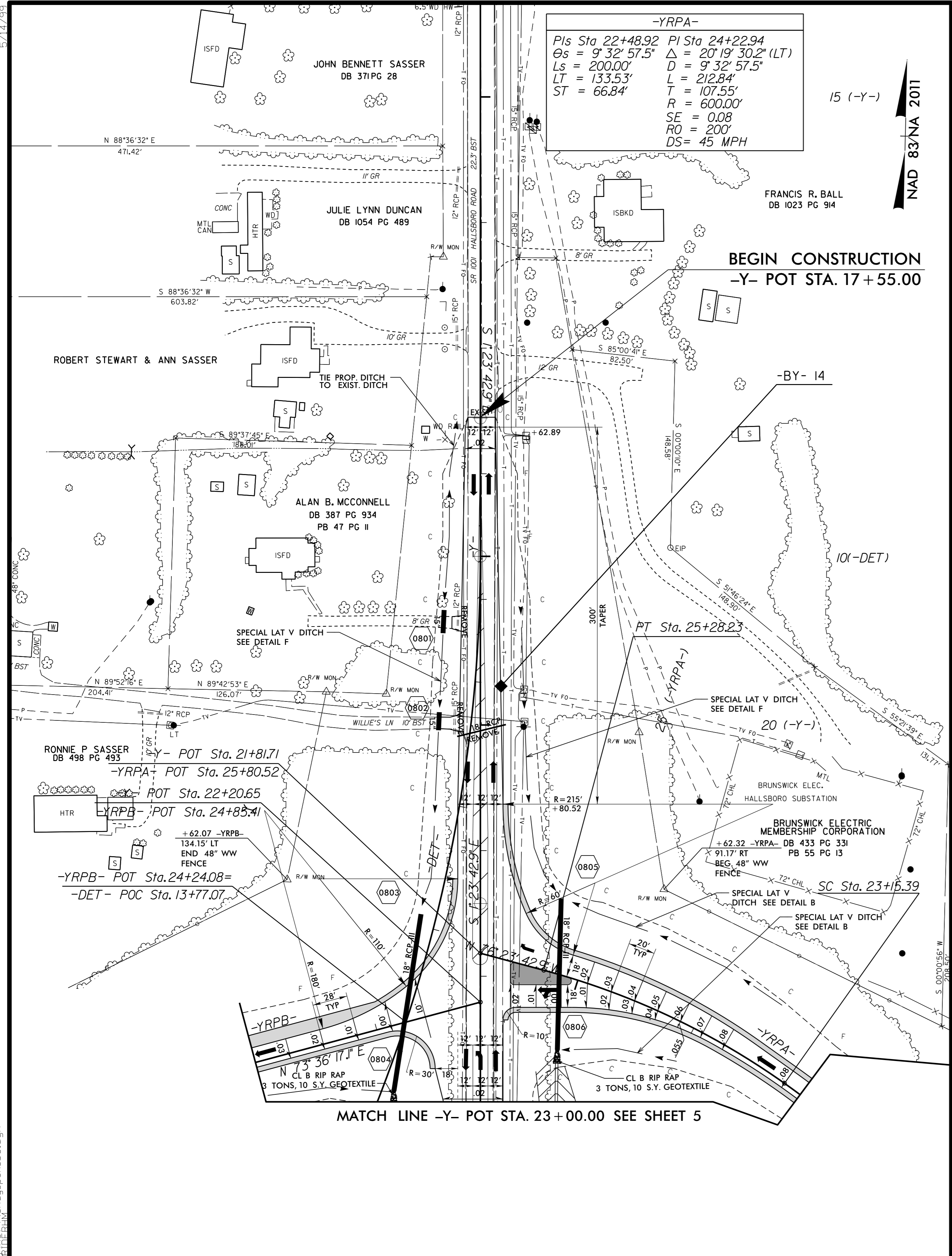
NAD 83/NA 2011



Invalid expression Rdj\_psh\_07.dgn  
USER: JAGKERR

SEE SHEET 11 FOR -L- PROFILE

PROJECT REFERENCE NO. <b>R-5749</b>		SHEET NO. <b>8</b>	
RW SHEET NO.			
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
 <b>David J. Clouder</b> David J. Clouder		 <b>A.T. Nottingham</b> A.T. Nottingham	
			

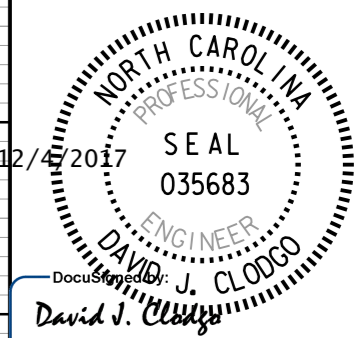
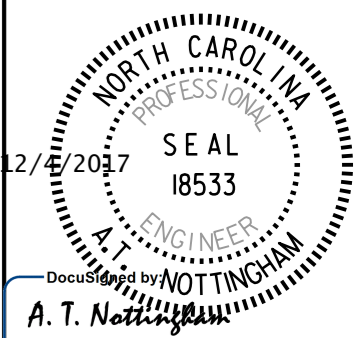

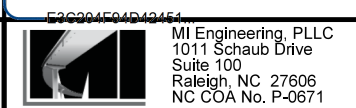


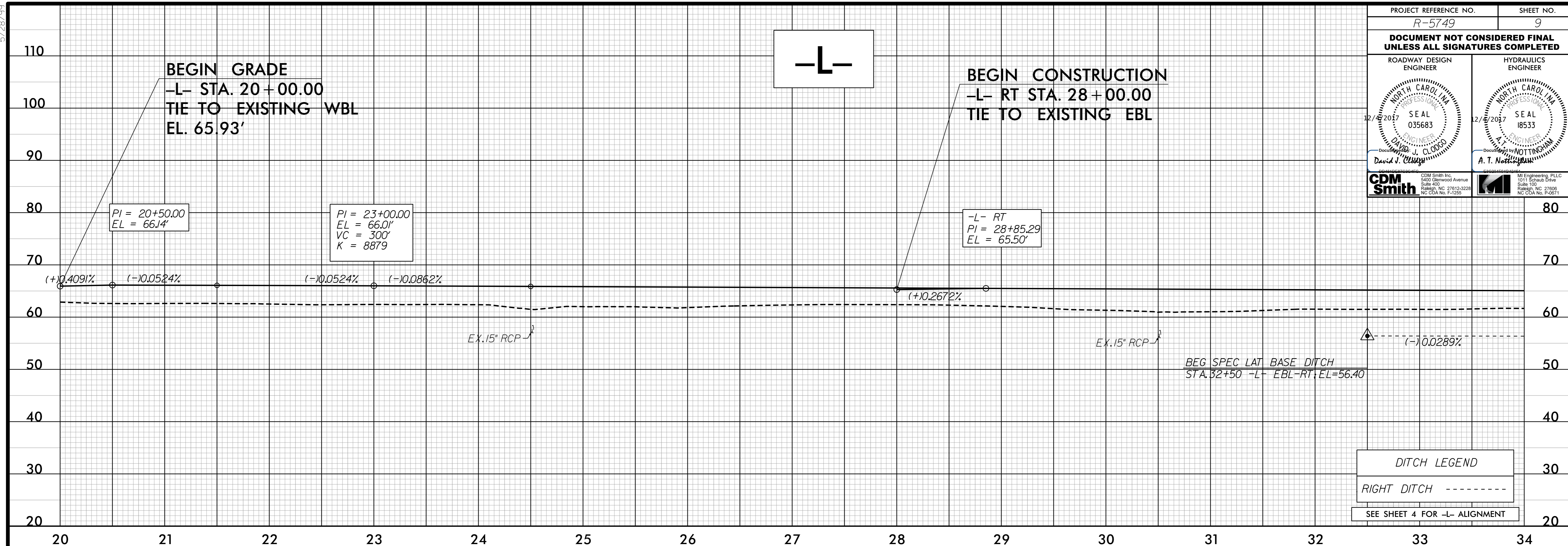
SEE SHEET 16 FOR -Y- PROFILE  
 SEE SHEET 2B-1 THRU 2B-3 FOR  
 DETOUR DETAILS  
 SEE SHEET 2B-4 FOR INTERSECTION  
 DETAILS

SEE SHEET 16 FOR -Y- PROFILE  
 SEE SHEET 2B-1 THRU 2B-3 FOR  
 DETOUR DETAILS

Invalid expression Rdj\_psh\_08.dgn  
 USER: H28K101111111111

5/28/99

PROJECT REFERENCE NO. R-5749	SHEET NO. 9
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER 
	

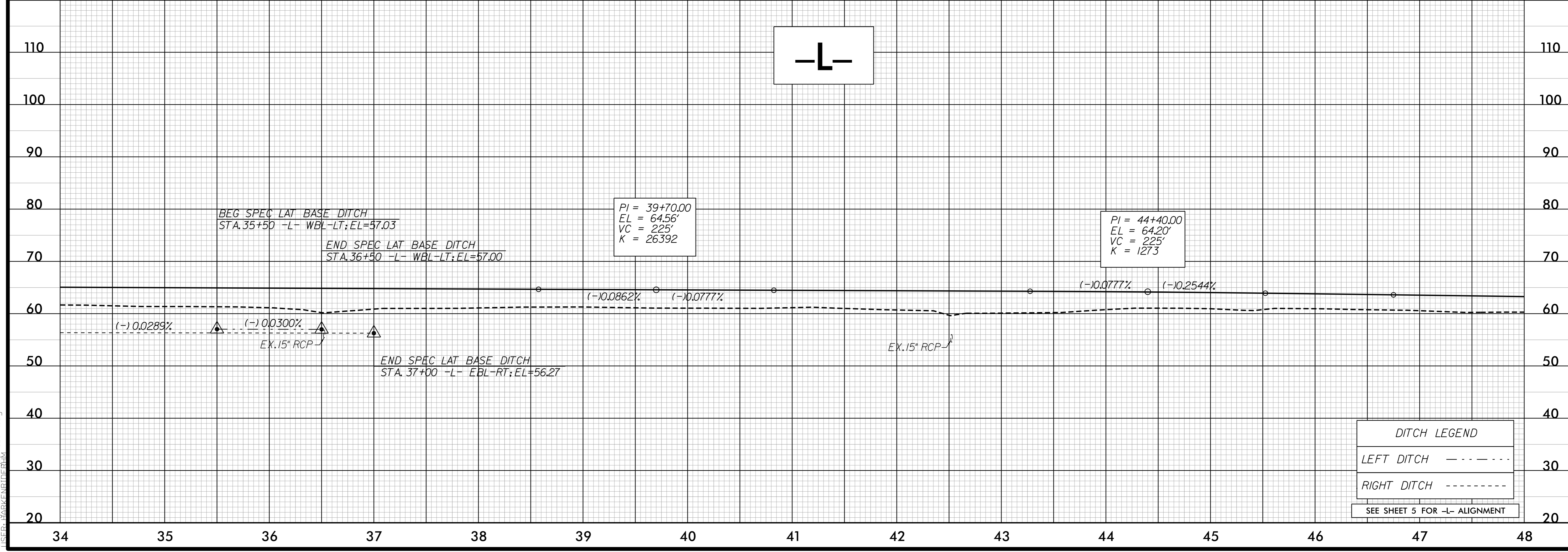


**DITCH LEGEND**

RIGHT DITCH - - - - -

SEE SHEET 4 FOR -L- ALIGNMENT

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**DITCH LEGEND**

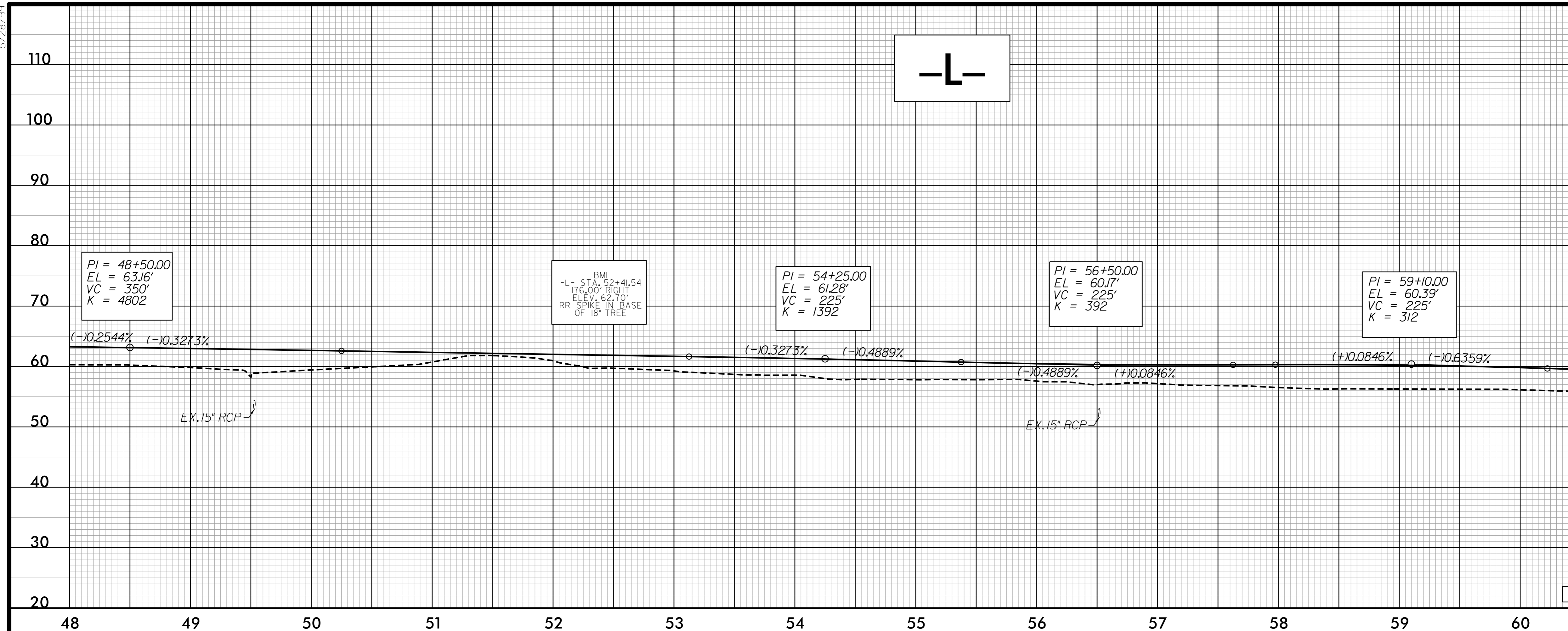
LEFT DITCH - - - - -

RIGHT DITCH - - - - -

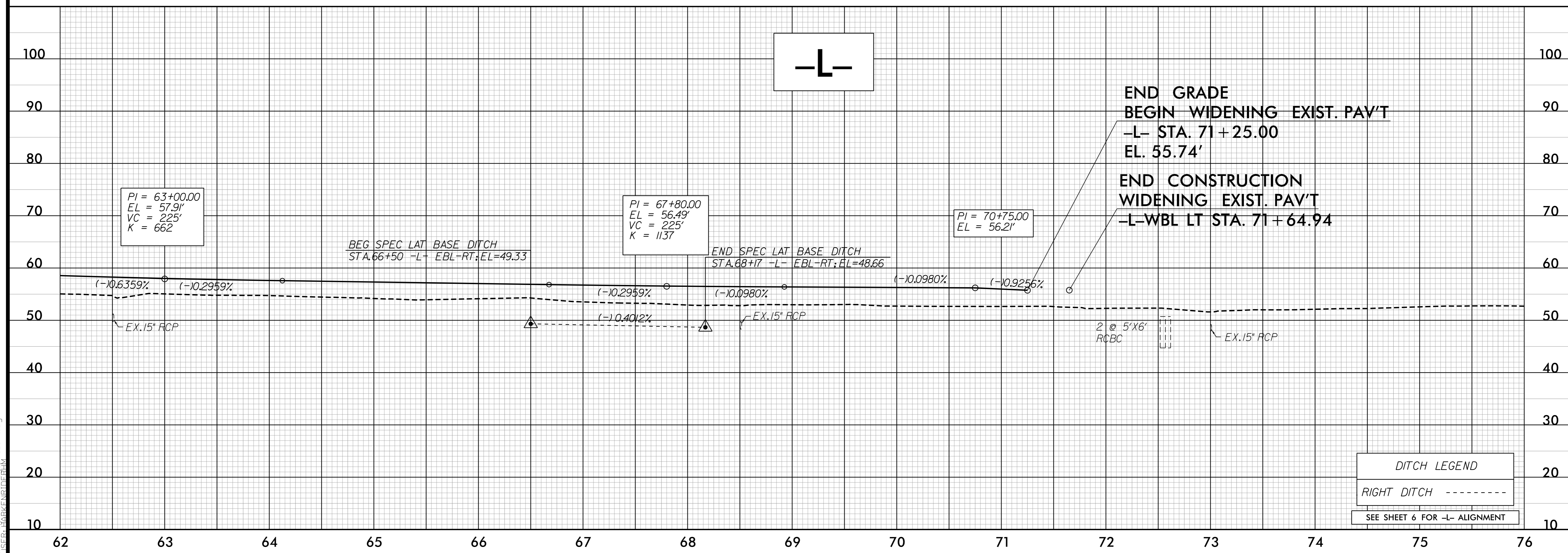
SEE SHEET 5 FOR -L- ALIGNMENT

5/28/99

PROJECT REFERENCE NO. R-5749	SHEET NO. 10
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
ROADWAY DESIGN ENGINEER DAVID J. CLODDO 12/4/2017 SEAL 035683 NORTH CAROLINA PROFESSIONAL ENGINEER	HYDRAULICS ENGINEER A. T. NOTTICHAM 12/8/2017 SEAL 18533 NORTH CAROLINA PROFESSIONAL ENGINEER
CDM Smith Inc. 5400 Glenwood Avenue Raleigh, NC 27612-3228 No. CDA No. F-2520	M Engineering, PLLC 1011 Schaub Drive Raleigh, NC 27606 No. CDA No. F-20871



SEE SHEET 5 FOR -L- ALIGNMENT



DITCH LEGEND

RIGHT DITCH - - - - -

SEE SHEET 6 FOR -L- ALIGNMENT

invgrid\_expression  
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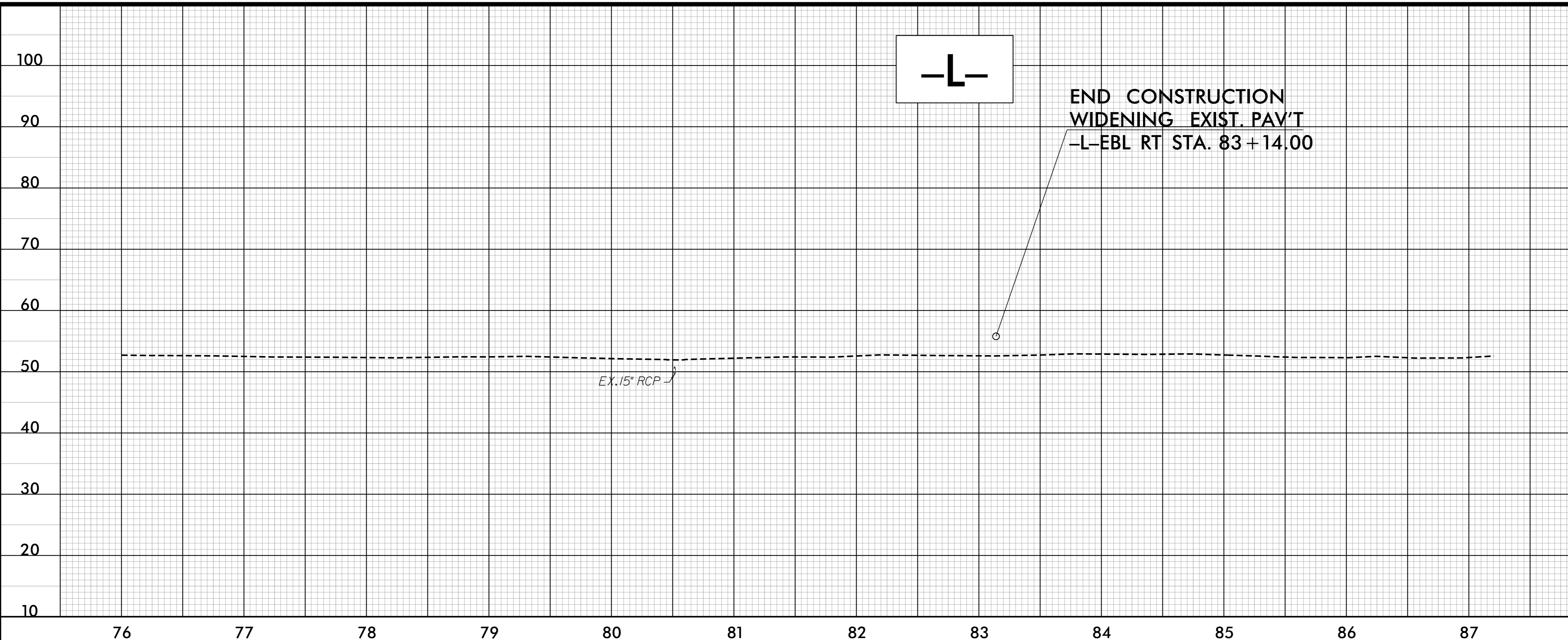
5/28/99

PROJECT REFERENCE NO. R-5749 SHEET NO. 11

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
David J. Cloddo	A. T. Nottingham

CDM Smith Inc. 5400 Glenwood Avenue Suite 400 Raleigh, NC 27612-3228 No. CDA No. F-1250	M Engineering, PLLC 1011 Schaub Drive Suite 100 Raleigh, NC 27605 No. CDA No. F-0871



-L-

END CONSTRUCTION  
WIDENING EXIST. PAV'T  
-L-EBL RT STA. 83+14.00

EX. 15" RCP

SEE SHEET 7 FOR -L- ALIGNMENT

THIS SPACE INTENTIONALLY BLANK









5/28/99

PROJECT REFERENCE NO. R-5749	SHEET NO. 15
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
ROADWAY DESIGN ENGINEER DAVID J. CLODDO SEAL 035683 12/3/2017	HYDRAULICS ENGINEER A. T. NATHAN SEAL 18533 12/3/2017
CDM Smith Inc. 5400 Glenwood Avenue Suite 400 Raleigh, NC 27612-3228 NC CDA No. F-250	A.T. Nathan Engineering, PLLC 1011 Schube Drive Suite 100 Raleigh, NC 27606 NC CDA No. F-20871

# -YRPD-

**PIPE HYDRAULIC DATA**  
Structure No.0613 To 0614 -YRPD- Sta.11+74  
Structure No.0615 To 0616

DRAINAGE AREA	= 111	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 117	CFS
DESIGN HW ELEVATION	= 53.93	FT
100 YEAR DISCHARGE	= 140	CFS
100 YEAR HW ELEVATION	= 54.53	FT
OVERTOPPING FREQUENCY	= 100	YRS
OVERTOPPING DISCHARGE	= 201	CFS
OVERTOPPING ELEVATION	= 55.2	FT

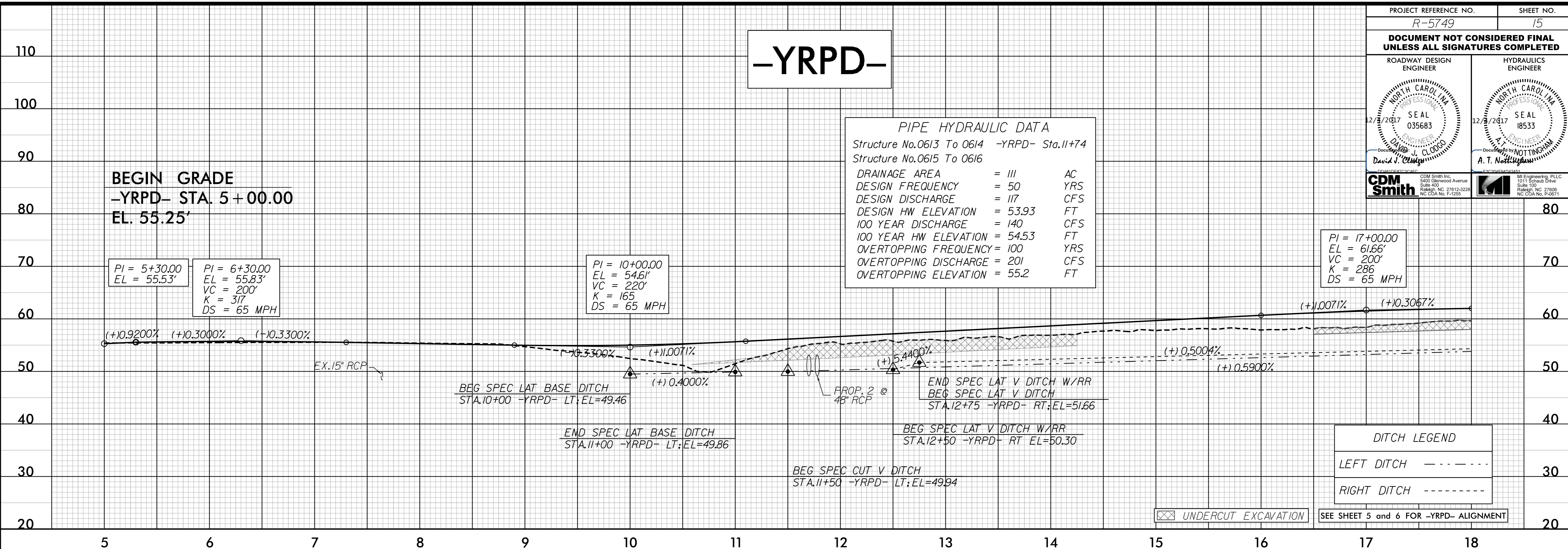
**BEGIN GRADE**  
-YRPD- STA. 5 + 00.00  
EL. 55.25'

PI = 5+30.00  
EL = 55.53'  
VC = 200'  
K = 317  
DS = 65 MPH

PI = 6+30.00  
EL = 55.83'  
VC = 200'  
K = 317  
DS = 65 MPH

PI = 10+00.00  
EL = 54.61'  
VC = 220'  
K = 165  
DS = 65 MPH

PI = 17+00.00  
EL = 61.66'  
VC = 200'  
K = 286  
DS = 65 MPH



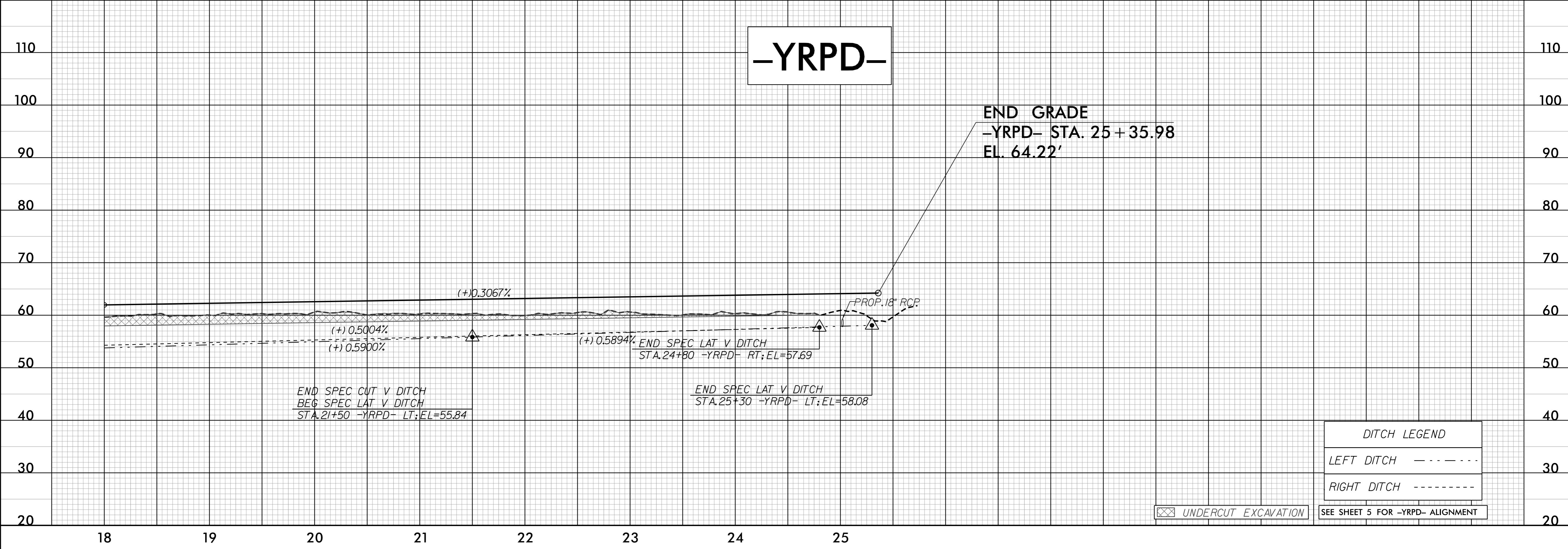
**DITCH LEGEND**  
LEFT DITCH - - - - -  
RIGHT DITCH - - - - -

UNDERCUT EXCAVATION

SEE SHEET 5 and 6 FOR -YRPD- ALIGNMENT

# -YRPD-

**END GRADE**  
-YRPD- STA. 25 + 35.98  
EL. 64.22'



**DITCH LEGEND**  
LEFT DITCH - - - - -  
RIGHT DITCH - - - - -

UNDERCUT EXCAVATION

SEE SHEET 5 FOR -YRPD- ALIGNMENT

invgrid\_expression  
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5/28/99

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

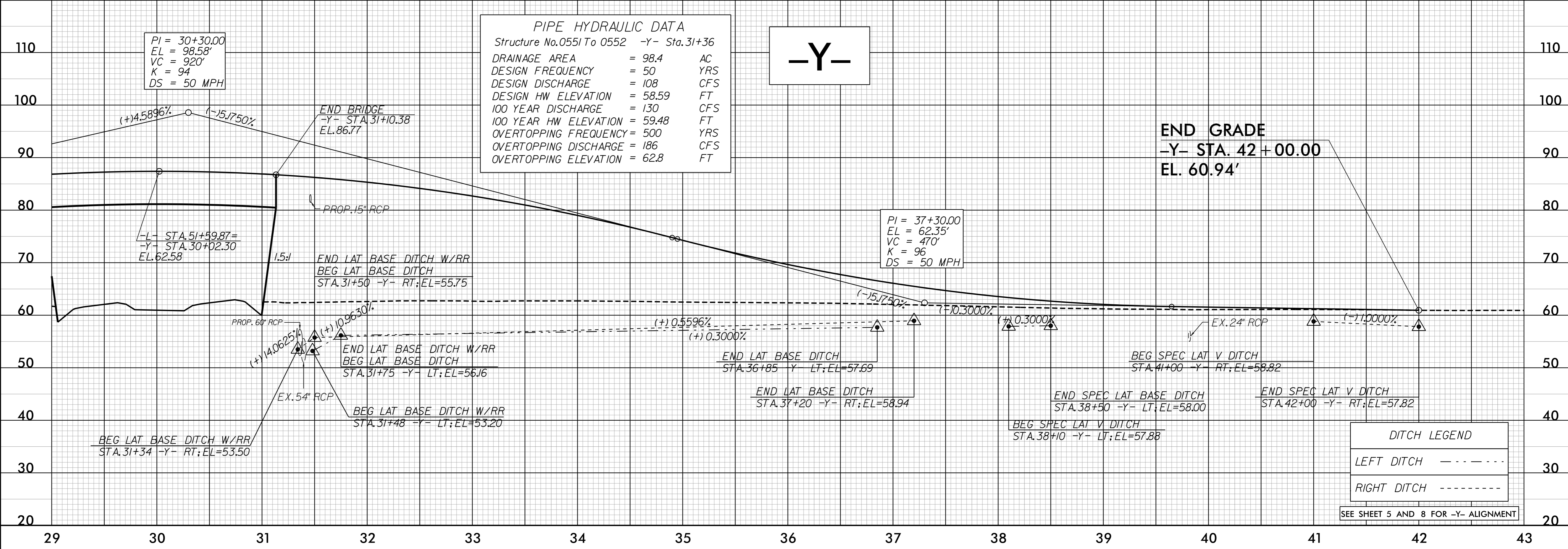
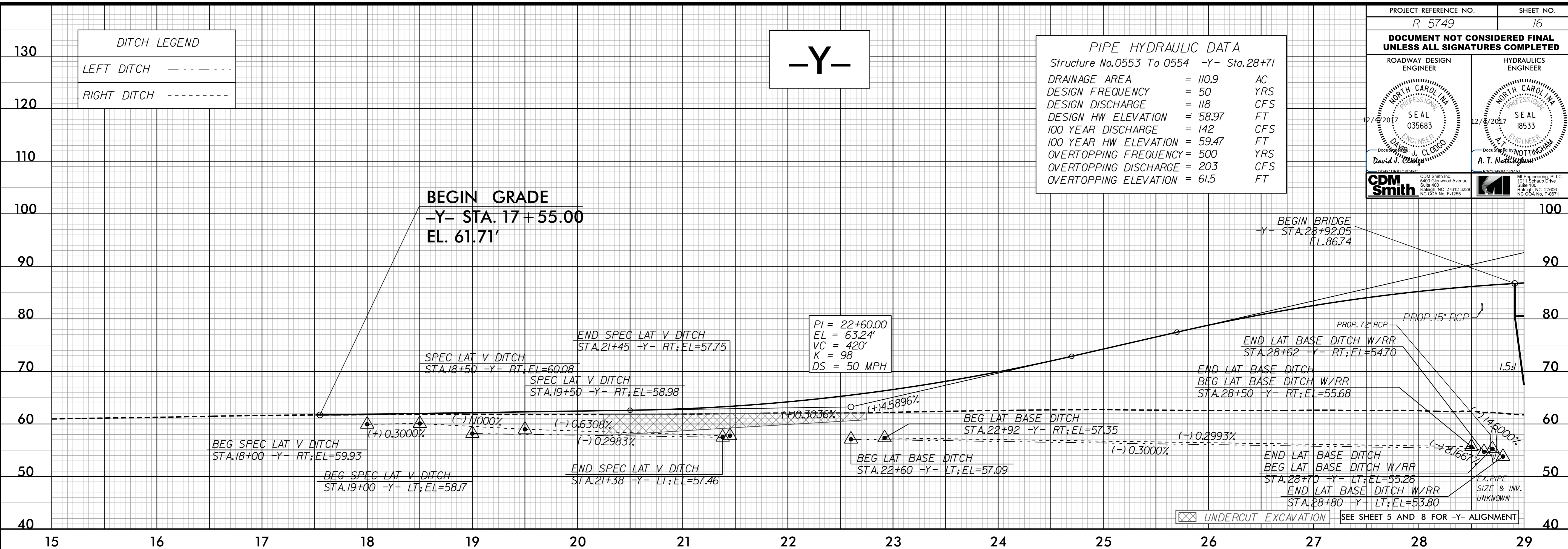
ROADWAY DESIGN ENGINEER DAVID J. CLODDO SEAL 035683 12/8/2017	HYDRAULICS ENGINEER A. T. NATHAN SEAL 18533 12/8/2017
--	--

**PIPE HYDRAULIC DATA**  
Structure No.0553 To 0554 -Y- Sta.28+71

DRAINAGE AREA	= 110.9	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 118	CFS
DESIGN HW ELEVATION	= 58.97	FT
100 YEAR DISCHARGE	= 142	CFS
100 YEAR HW ELEVATION	= 59.47	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 203	CFS
OVERTOPPING ELEVATION	= 61.5	FT

**CDM Smith**  
3000 Glenwood Avenue  
Suite 100  
Raleigh, NC 27607  
No. CDA No. F-250

**A.T. Nathan Engineering, PLLC**  
1011 Schaub Drive  
Suite 100  
Raleigh, NC 27607  
No. CDA No. F-20871



invgrid\_expression  
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